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A CONCEPTUALIST ONTOLOGY

by U. T. PLACE

The Ontological Import of the Picture Theory of Meaning

In evaluating the measure of agreement between his own position and Place's, Armstrong states that

While very sympathetic to Place's version of the picture theory of the meaning of sentences, Armstrong would ... add a warning note. It must not be assumed that when monadic and polyadic predicates are applied *and truly applied* to particulars, the situations which made the application true - the truth making situations - always correspond to the form of the sentence in a perspicuous manner. (p. 34)

He then proceeds to illustrate this point by means of the examples *Jack is a father*, where he claims that the predicate 'is a father' looks like a property rather than what it actually is - a relation, *the man is healthy*, *the food is healthy*, and *the urine is healthy*, which "are made true by situations of quite different sorts", and the evidence of relativity theory which forces us to conclude that "simultaneity should be pictured as a three-place rather than a two-place predicate."

Now, although Armstrong does not attribute this view to him, it is worth emphasising that Place is not committed to the view that there is always, or even typically, a simple and invariant mapping between types of syntactic unit and the types of entity, feature or situation they depict. That this cannot be part of Place's view is evident from the fact that the conceptualism to which he is committed involves denying the existence of abstract objects. According to this view the belief in abstract objects is a result of the practice of nominalising an expression whose natural occurrence within simple sentences is as or within a predicate expression, in order to be able to put the expression into an argument place (usually the subject argument place). Thus instead of saying *The glass is brittle* we can say *Brittleness is a property of the glass*. This device enables the speaker to focus on the predicate and what it stands for, instead of *using* it, as in the first case, simply to say something *about* something else, in this case the glass. Unfortunately argument places, particularly the subject position, have a double function. One is the function of bringing something into the focus of discussion. The other is function which it has in cases like *The glass is brittle* or *The cat is on the mat* of indicating that what is being mentioned by this part of the sentence is an object (in the sense of a physical substance or concrete spatially extended and bounded particular). Clearly 'brittleness' is not an object in this sense. So we are tempted by the use of the noun form occupying the subject position in the sentence to suppose that what we have here is another kind of object, an abstract object.

A similar argument applies in the case of intentional objects or "referentially opaque contexts", as Quine calls them. In this case a linguistic expression occupying the direct-object argument place, as in the case of the noun phrase 'an apple' in the sentence *I would like an apple, if there is one*, is used, not to refer to any actual object as the form of the sentence might suggest, but to specify a range of possible objects any one of which would satisfy the speaker's desire. Here again we are tempted by superficial grammar to follow Meinong in postulating an *Außersein* inhabited by these 'inexistent' intentional objects. Needless to say, it is a similar thought process which has led philosophers to propose the ontology of possible worlds in order to accommodate another grammatical device, very germane to the present discussion, the counterfactual conditional.

These, however, are all examples of cases where the 'surface structure' of language tempts us to add entities to our ontology *praeter necessitatem*. I am not at all convinced by Armstrong's contention that we are in a similar danger of adding redundant features - properties and relations - to our ontology on the basis of the surface structure of predicate expressions when playing their normal role as the function around which the sentence revolves. I agree that the surface structure of predicate expressions can sometimes be misleading in that speakers and writers frequently omit one or more argument places in the case of a multi-place (relational) predicate. In the case of a two-place predicate, omitting one of the two argument places

has the effect of giving the predicate a monadic surface structure typical of expressions which ascribe properties rather than relations. This is well illustrated by Armstrong's first example *Jack is a father*. Here the surface structure of the sentence makes 'is a father' a monadic predicate, whereas the fact that no one can be a father, unless there exists at least one other individual to whom that person stands in the relation of father to child shows that being a father is really a relation.

Armstrong's second example seems less suited to the point that he intends. *The man is healthy*, *The food is healthy* and *The urine is healthy* are examples, not of differences in the surface structure/deep structure relation, but of two different senses of the word 'healthy'. In *The man is healthy* and *The urine is healthy*, 'healthy' means 'free from disease'; whereas in *The food is healthy* it means 'having a disposition to protect the consumer of it from illness'.

The only example Armstrong gives which supports his claim that "it is for total science to tell us just what are the true properties and relations of particulars" is his third example. This is the example of simultaneity, where he claims that physics teaches us that what we might have thought was a straightforward two-term relation between events is in fact a three-term relation involving the point of view of an observer. However, I am not at all sure how apt this example is for his purpose. For it is arguable that the three-term simultaneity of relativity theory is *apparent* simultaneity as viewed from a particular standpoint, not *real* simultaneity which is absolute and two-term. Of course, the point that relativity theory is making is that when events are separated from one another by distances on the astronomical scale, this notion of absolute simultaneity is of no conceivable scientific interest. For our only interest in the simultaneity of events derives from our interest in questions such as

Are these two observations of one event or of two discrete events?

or

How are these two events causally related to one another?

Neither of these questions could conceivably arise with respect to two widely separated, but absolutely simultaneous events. For if two events are widely separated in space, the possibility of this being one and the same event hardly arises. But since nothing travels faster than light and light nevertheless takes a finite time to travel from one point in space to another, it follows if two events are widely separated and simultaneous in the absolute sense, there can be no possible causal influence of the one event on the other.

Nevertheless, despite some deficiencies in the examples he uses to illustrate the point, Armstrong's contention that the "surface structure" of a sentence does not always correspond in any simple way to the reality which it depicts is clearly correct. But if that is agreed, we are confronted with what is arguably the most fundamental problem in the methodology of ontology, namely, the problem of how to decide which parts of the structure of a sentence correspond straightforwardly to objects and features of reality and which do not. The only answer I can suggest to that problem is that in deciding such questions we should be guided by three principles:

- the principle of choosing those ontological assumptions which make best sense of the human ability to construct and construe novel sentences in natural language,
- the principle whereby the child will begin by construing and constructing sentences in which there is a one-to-one correspondence between lexical items and some aspect of the extra-linguistic environment, and will only begin to use more devious and sophisticated forms of expression, such as nominalisation or referentially opaque expressions, at a later stage in its linguistic development,
- the principle of ontological parsimony (Ockham's razor).

I am reluctant to add to these Armstrong's principle, as stated above, which would require us to add to or subtract from our ontology in order to accommodate varieties of existent postulated within scientific theory. This reluctance is grounded in the belief that the source of the philosopher's claim to authority in matters of ontology derives from an understanding of the process whereby linguistic utterances acquire the dispositional property of depicting a reality beyond themselves. Since human beings developed their languages in the first place in order to describe their physical and social environment at the scale dictated by the sensitivity of their sense organs, we should not be surprised if scientific investigations of phenomena

at scales very different from that of common sense observation should lead us to postulate existents which do not fit conveniently into the categories of common sense, things like curved space, or light which from one standpoint consists of particles and from another of a series of waves, waves, moreover, which are unlike sound waves or the ripples on water in that there is no medium corresponding to the atmosphere or the surface of water which is being perturbed in this way. But what experience tells us, I suggest, is not that, in order to accommodate such cases, we need to add new categories of existent to our ontology or abandon old ones. It is rather that in these areas we have passed beyond the proper scope of natural language into a domain where only the language of mathematics has literal application. For a conceptualist this conclusion is no embarrassment. It simply emphasises the mind-dependent character and consequent limitations of our conceptual scheme. It confirms the view that it is a mistake to do, as Armstrong proposes we should, namely, project that conceptual scheme onto reality by postulating universals and laws of nature as something more than convenient ways of classifying particulars and characterising the way particular relations between particular situations resemble one another.

Concrete particulars, features and situations

It is gratifying to learn that despite differences over the ontological status of universals and laws of nature there is a considerable agreement between us over the basic ontological categories that need to be recognised. Place would perhaps accept Armstrong's claim that situations or, as he prefers to say, "states of affairs" constitute "a super-category" in the sense that situations include features and features include concrete particulars. Concrete particulars do not exactly include the features which they 'bear'; nor do features include the situations which are constituted by something's possessing them. Nevertheless Place would prefer to emphasise the interdependence of these three categories. Like Armstrong he rejects 'bare' or propertyless particulars. He also rejects 'bare' features, i.e. properties and relations which are born by something without thereby existing, coming into existence or ceasing to exist and thus constituting a state of affairs or event. But so does Armstrong.

Where the two views begin to part company is over the issue of 'atomic situations' or 'atomic facts', to use Russell's¹ term. Place accepts that sentences map onto situations and that there are such things as 'atomic sentences' of the 'cat on the mat' variety two or more of which can be linked together by the relations of conjunction, disjunction or implication to form compound sentences which are not themselves susceptible to analysis into a conjunction, disjunction or implication between sentences at a more fundamental level. What he is reluctant to accept is that there is a corresponding distinction to be drawn between 'atomic' and 'compound' situations or facts. This way of talking seems justifiable if you consider a conjunction *The cat is on the mat and eating its dinner*. Here we do seem to have a compound of two distinct situations, the cat on the mat and the cat eating its dinner. But, in the case of a disjunction or implication, it seems very odd to say that the situation whereby it is true is a compound of the two situations mentioned in the compound sentence. Do we really want to say that the situation which makes true the sentence *Either the cat is on the mat in the kitchen or it is on the bed upstairs* is a compound of the situation specified in *The cat is on the mat in the kitchen* and that specified by *The cat is on the bed upstairs*? Surely not. What makes the compound sentence true is whichever of the two situations specified by the two constituent atomic sentences happens to exist. Here again there is no disagreement between the two views.

Another set of considerations which also incline Place to resist the temptation to talk of discrete atomic situations are those derived from Elizabeth Anscombe's observation² where she points out that a past action, where an action is a species of event and, hence, a species of situation, can be characterised by reference to any of its consequences however remote they may be both in time from the agent's actual contribution and in conception from his or her intention in so doing. This is not just a matter of alternative ways of characterising exactly the same situation, an agent's contribution to a particular chain of events. It may well be that what counts as the agent's contribution will change according to the consequence by reference to which the action is described. Take, for example, the case of someone who kills someone else by shooting them. It may happen that the victim is killed outright by the first shot. In this case the agent's contribution ends with the pulling of the trigger. After that events simply take their inevitable course. But suppose that the victim is only wounded by the first shot and the range is short enough for the agent to see what the consequences of the first shot have been. In this case the agent has a choice between

1. attempting to reverse the consequences of his or her initial act by trying to stem the flow of blood from the

- wound,
2. leaving the victim to die or not as the case may be,
 3. finishing the victim off by firing further shots into the body at close range.

Here agency with respect to the eventual death of the victim extends no further than the initial pressing of the trigger, if course 1 is selected. It extends up to the point where the agent no longer has the option of trying to prevent the sequence of events from taking this course, if course 2 is selected. It extends up to the moment when the final shot has been fired, if course 3 is selected, even if it is the case that the victim would have died anyway as a consequence of the first shot.

For these reasons Place would be uncomfortable with the claim "that the world is a world of situations or states of affairs", if that is taken to imply that there is one uniquely correct way of carving up the world into situations. He is equally resistant to Armstrong's suggestion that, holding as he does that situations are spatially and temporarily located, he is committed to

recognizing space and time or space-time as entities or an entity additional to his situations. (pp. 33-4)

Nor can he accept

Armstrong's suggestion that space-time is itself to be thought of as a huge situation or state of affairs consisting of a conjunction of innumerable simpler situations. (pp. 34)

So conceived, space, time and space-time are abstract objects whose existence Place denies, regarding them as linguistic fictions generated by the process of nominalising predicates. All that exists on this view are particular spatial relations between and within concrete particulars and particular temporal relations between and within particular situations. 'Space' and 'time' are shorthand for classes of relations, spatial relations, temporal relations and spatio-temporal relations. Spatial relations are relations which hold between concrete particulars. Such particulars occupy particular volumes of space defined by the relation of those volumes to the volumes occupied by other such particulars, at a particular moment or over a particular stretch of time.

Temporal relations, on the other hand, are relations which hold, not between concrete particulars, but between situations. Processes and states of affairs are temporally extended between the instantaneous events constituted by their beginning and their end. But whereas concrete particulars are located and extended both spatially and temporally, situations are not, strictly speaking, located or extended in space, as is shown by the example of the telephone conversation between someone in the United Kingdom and someone in Australia which is not located in either country. Nor can it be intelligibly thought of as extended along the telephone lines or satellite link between the two. What *are* spatially located are the concrete particulars involved, the two speakers and the telephone equipment employed in transmitting the voice sounds they are making from one place to the other. There are, of course, events such as battles which have a spatial location and extension which is not dissimilar from that of a concrete particular such as the town or village from which it derives its name. But even in this case the location and extension of the event is entirely parasitical on the location of the individual participants during their interaction. This is true even where, as in the case of a sporting event, the location is narrowly constrained by the fixture list and the rules of the game.

The dispute about universals

Repeatedly in the previous chapter Armstrong accuses Place of holding a nominalist view of universals. It is true that the conceptualist theory of universals entails rejecting the Platonic view that universals are independently existing abstract objects. Conceptualism, however, differs from nominalism in that it does not, as Armstrong claims, deny the existence of universals. On this view to say that a universal or kind of thing exists is to say that there are instances of that kind. If, as in the case of witches, centaurs or dragons, a universal has no instances and never had, we can say that the universal exists, but only in the sense that some human beings have a disposition to assign instances to those categories, but, as it turns out, no instances which genuinely satisfy the criteria for that assignment are to be found. What is denied is that

there is any other sense besides these two in which universals can intelligibly be said to exist.

In defending his view that there *is* some further and stronger sense in which universals exist, Armstrong would not want to deny the conceptualist claim that universals which have no instances exist only as constructions of the mind. The universals which for him exist *in re* only do so in those cases where the universal has instances. Despite Armstrong's two-volume exposition of the matter,³ Place is not persuaded of the need to postulate the existence of a universal as an entity distinct both from its instances and from the human disposition to classify things in that way, but which as the very same individual somehow inhabits all its instances and would not exist if they did not. Here, surely, is a prime candidate for ontological excision in accordance with Ockham's razor.

From the arguments he deploys in defence of his view, it would appear that Armstrong is not claiming the existence of a universal as an entity distinct from its instances in the case of what Aristotle called Second Substances, i.e., kinds of concrete particulars or substances. For him it is only features, i.e. properties and relations, which exist as universals distinct from their instances. What is claimed is that in a case where two objects exactly resemble one another, where, for example they are both painted exactly the same shade of red, they both partake in one and the same universal which is present in all past and present objects anywhere in the universe which are painted exactly that shade of red. Stated in this way, the doctrine appears somewhat implausible. However, when presented as a conclusion of an argument which has been around since its first recorded formulation by Plato⁴, it is not easily resisted. The argument runs as follows:

1. We recognise things as instances of a kind because they resemble one another.
2. If two things resemble one another they resemble one another in some respect.
Therefore
3. Different kinds of things resemble one another in different respects.
But
4. If two things resemble one another in some respect, they share one or more properties in common.
5. If two things share a property in common, that very same property exists in both of them.
Therefore
6. Instances of the same kind of thing share a common property or set of properties, such that the very same (universal) property exists in all of them.

This argument can be resisted by employing the same strategy as that outlined at the beginning of this section, that is to say, by considering what we mean when we say that a kind of thing exists. If all we mean when we say that the same property exists in all instances of a kind is that all instances of that kind are instances of the kind 'bearers of a certain property', we are saying no more than that possessing that property is our criterion for assigning instances to that kind. To say that a substance possesses a given property is to say that that property-kind has an instance. Consequently to say that all instances of a kind of substance possess a particular property is to say no more than that that property-kind also has instances, and that whatever is an instance of that kind of substance is also an instance of the kind 'bearer of that property'.

The role of dispositions in causation

In criticising Place's contention that a modal or dispositional property, such as brittleness, depends causally on, and is therefore not identical with, an underlying state of the microstructure of the entity possessing that property, Armstrong claims that that commits Place to the view that when

the glass is suitably struck ... this initiating cause ... *plus* the microstructure of the glass, *plus* the brittleness of the glass, *plus* (perhaps) further attendant circumstances ... bring about the shattering of the glass. (p. 38)

This formulation is a serious misrepresentation of Place's view. On that view "the state of the microstructure" is shorthand for a multiplicity of causal factors which combine to bring it about that the glass has the particular degree of brittleness that it does have, just as the cubic capacity of the cylinders, the ignition timing, the compression ratio, the length of the stroke, the presence or absence of a

supercharger, etc, etc, combine to determine the horsepower produced by an internal combustion engine. The state of the microstructure in this sense is the cause, not of the glass's breaking, but of its brittleness. It is the brittleness, not the state of the microstructure which is a part cause of the glass's eventually shattering as and when it did. Of course we can say that the state of the microstructure *indirectly* determines the glass's shattering by giving it that particular degree of brittleness. But to say that the shattering is caused by the striking *plus* the brittleness *plus* the state of the microstructure is grossly misleading.

Armstrong then proceeds to suggest that Place is somehow committed to the view that

- 1 the initiating cause,
- 2 the microstructure,
- 3 the brittleness,
- 4 any required attendant circumstances,

taken all together, *logically necessitate* that

- 5 the manifestation occurs.

Having erected this straw man, he then objects, quite correctly, that causal relations are contingent rather than logically necessary. Of course; but then what in Place's writings here or elsewhere commits him to the view that causes logically necessitate their effects? Place holds, of course, that there is what Hume called "a necessary connection" between a cause and its effect. But that necessary connection is construed in terms of the truth of Hume's⁵ counterfactual

if the first object had not been, the second had never existed.

In terms of the *logical* distinction between the necessity and contingency of *statements*, statements ascribing this kind of causal necessity to the relation between two *situation tokens* are contingent, a fact of which Hume was well aware.

Contingent Identity

Unlike Armstrong who accepts at least some of Kripke's⁶ *a posteriori* and *de re* logical necessities defined in terms of what is true in all possible worlds, Place's conceptualism and intensionalism lead him to regard necessity, in the sense in which necessity contrasts with contingency, as exclusively *de dicto*, *a priori* and a matter of what can and cannot be denied without self-contradiction, given the semantic conventions of the language. The only kind of necessity that is *de re* is causal necessity which does not contrast with contingency⁷ and whose presence or absence is a matter of contingent fact to be decided *a posteriori* by experimental observation.

Identity is a relation between two linguistic expressions whereby they share a common referent. Whether an identity is necessary or contingent is a *de dicto* matter, decided *a priori* by whether the identity statement can or cannot be denied without self-contradiction. By this criterion, token identities are typically contingent, type identities typically necessary.⁸ This is not to say that the question of whether or not an identity is contingent or necessary is unaffected by empirical discovery. In science, type identities which are contingent hypotheses when first formulated become necessary truths when the conventional criteria for assigning instances to universals begin to change so as to incorporate the empirically discovered "real essence of a natural kind" into the meaning of the words and expressions of natural language. Thus, our criteria for assigning an instance to the kind *water* have changed so as to incorporate the empirical discovery that all instances of that liquid turn out to have the chemical composition H_2O . As a result, the statement *Water is H₂O* which was once a contingent hypothesis, becomes a necessary truth. Kripke's⁹ well known 'intuition', the intuition that there is difference in this respect between these now necessary identity statements and the statement *Pain is C-fiber firing*, is simply a reflection of the fact that the physiological composition of pain has not yet been established by scientific research and that consequently this tentative and almost certainly mistaken hypothesis as to what it might be has, mercifully, not yet become ingrained in the linguistic habits which are the source of our semantic intuitions. It remains a hypothetical contingent identity.

But having endorsed the concept of contingent identity with respect to hypothetical identity statements like *Pain is C-fiber firing*, why should Place be reluctant to extend this principle, as Armstrong wishes to do, to dispositional properties and their microstructural basis? There are, I believe, three reasons for thinking that dispositional properties cannot be identical with their micro-structural basis: (a) differences of category, (b) differences of location, and (c) differences in causal role.

Differences between dispositional properties and their microstructural basis

Differences of category

Two descriptions cannot be descriptions of one and the same thing if there is a difference of category between the kind of thing picked out by one description and that picked out by the other. In the case of the alleged identity between dispositional properties and their basis in the microstructure, both descriptions are descriptions of properties, but they are descriptions of properties of different kinds. Dispositional properties are modal properties. They consist in their possible future and past counterfactual manifestations. The microstructural properties of an entity on the other hand are categorical, which, of course, is why Armstrong who finds modal properties offensive wants to reduce the dispositional to the microstructural. Moreover, as we have seen (above p. 27), there are reasons to think that these categorical structural properties are really categorical spatial *relations* between the parts of which the microstructure is composed, and not genuine properties at all. It follows that for Place the gulf between these two kinds of property or feature, to be more precise, is unbridgeable. Hence the complementary, but essentially different, roles which ascriptions of the two kinds of feature play in causal explanation.

Place holds, following Ryle¹⁰ that particular dispositional statements, i.e., statements ascribing dispositional properties to particular individuals over limited stretches of time, are "lawlike" in the sense that they involve universal quantification over possible situations (events or states of affairs) occurring or existing within that limited stretch of time. In other words what we are saying when we say that the glass is brittle is that *if at any time so long as it exists and remains brittle*, the glass is suitably struck, it will break. Place also holds, following Goodman¹¹ that such dispositional statements are sufficient to 'support' causal counterfactuals without the need to invoke truly universal laws which are not limited to individuals and stretches of time.

By contrast statements ascribing categorical properties to an entity relate not to what would have happened in the past or would happen in the future, if certain contingencies had arisen or were to arise, but to what is or was actually the case at some moment or over some stretch of time. Categorical statements of this kind have two functions in causal explanation. Firstly they serve to describe what actually happened or was the case as opposed to what would have happened or been the case if things had been different from what they actually were. Secondly they serve to characterise those actually existing parts and features of the entities involved which when combined with the dispositional properties of those parts and features, bring it about that the entity as a whole has the dispositional properties it does have.

Differences in location

It appears from this that the difference in category between modal and categorical properties boils down to a difference in their relation to time, the difference between what actually happens or is the case at or over time and what might happen or be the case but which may not or did not happen or may not be or was not the case. There is a similar difference in the case of dispositional properties and their microstructural basis in their location or relation to space. Roughly speaking, we can say that the microstructure of an entity is inside the entity, whereas the dispositional property, in so far as it is located anywhere, is outside the entity at its point of interaction with other things. Two descriptions which refer to things which are located at different points or areas of space cannot be descriptions of one and the same thing.

The most striking example of a case where a dispositional property is located outside the entity while its microstructural basis is inside is the case of the magnetic field of an iron bar and its basis in the bar's molecular and atomic structure. But there are exceptions. There are cases, such as the dispositional property of smoothness, where both the putative interaction with other things and the microstructural basis of the disposition are on the surface rather than inside the disposition's owner. There are also cases, such as Molière's¹² "*virtus dormitiva*", a dispositional property of opium where the manifestation of the disposition (the opium-taker's going to sleep) takes place, in some sense, inside the affected organism, and

where the putative interaction consists, at the macrostructural level, in some form of ingestion of the substance by the organism and, at the level of the microstructure, in an interaction between the chemical structure of the opium and the biochemistry of the opium-taker's brain. In this case everything is inside; but the difference in the precision with which location is specified in the case of manifestation, interaction and microstructural basis is hardly consistent with the hypothesis that the dispositional property and its microstructural basis are one and the same thing.

Differences in causal role

Armstrong, of course, is not insensitive to these differences between characterisations of what he regards as the causal/modal and categorical aspects of the same property. What he does not accept is the difference in causal role between a dispositional property and its microstructural basis. As we have seen, the only way he has of interpreting Place's contention that there is a causal relation between the microstructure and the dispositional property is to suppose that what is being claimed is that the microstructure is a causal factor alongside the dispositional property in the causation of the manifestations of the disposition. He cannot accept the notion of the microstructure as cause with respect to the existence of dispositional property as effect. For to concede *that* would be to concede that the microstructure and the dispositional property are two separate things and not one and the same thing under two different descriptions.

It would seem, however, that the case for and against these competing interpretations can only be made out in relation to concrete examples. Place has already adduced the example of the horsepower of an engine and its basis in such features of its microstructure or the cubic capacity of its cylinders. He has used this example to generate the suggestion that the term 'microstructure' is shorthand for a multiplicity of causal factors of which, in the horsepower case, the cubic capacity of the cylinders is only one which combine to contribute to the resulting dispositional property of the entity as a whole.

Armstrong, on the other hand, cites Kripke's¹³ example of heat and molecular motion and his own example of the gene and its realisation in DNA as cases in which the same thing is characterised in two different ways, necessarily in the case of *Heat = molecular motion*, as a matter of contingent fact in the case of *Gene = DNA*.¹⁴ Of these, the gene example is relatively easily handled from Place's perspective. For a gene, even when its physico-chemical realisation was unknown, is not and was not a dispositional property. It is the previously unknown basis in the microstructure of an organism on which depend its inherited dispositional properties, such as the propensity to develop hair of a particular colour or the propensity to develop Huntington's chorea in later life. The presence of the gene is and always was the *cause* of such propensities, not the propensity whose existence is thereby explained.

The heat case is more complicated. This is partly because, although being hot or cold is a property rather than a relation, when we use these words, there is always an implicit comparison with something else than which the object in question is hotter or colder; but it is partly also because the property possessed by an object or body of stuff which has a certain temperature is partly categorical and partly dispositional. The categorical part of the property is a matter of how the object or body of stuff is in itself, independently of the effect that it has or is liable to have on other adjacent things (the dispositional part of the property). It is this categorical property of being intrinsically hot which consists in (is one and the same thing as) having its molecules in a state of relatively rapid Brownian motion. The dispositional part of being of a certain temperature, on the other hand, consists in the object's propensity to impart its heat (molecular motion) to other bodies of *lower* temperature than itself with which it is in direct physical contact and to receive heat (molecular motion) from other bodies of *higher* temperature than itself with which it is in direct physical contact. In this case the molecular motion of the body stands as cause rather than as constituent with respect to this (dispositional) property. The situation is still further complicated by the fact that there is a form of heat, namely, radiant heat which has the dispositional property of imparting heat in the categorical sense to objects at a distance from the radiant energy source without having to impart molecular motion to molecules in the intervening space which may be empty, as in a vacuum. In this case although molecular motion in the heat source is a part cause of its emitting radiant heat, to claim that *this* form of heat *is* molecular motion is quite simply false.

Laws of Nature

We now come to the key issue which divides the two positions, namely, what are the ontological commitments or, to put it another way, what is the truthmaker of a causal counterfactual? Is it, as Place

maintains, the existence of a dispositional property as something over and above the state of the microstructure of the entity to which the property belongs on which, on this view, the existence of the property depends? Or is it, as Armstrong maintains, a matter of the existence of two things

- a purely categorical state of the microstructure of entity in question, and
- a law of nature considered as a state of the world whose existence makes true the universal law statement from which the counterfactual is deduced?

There is, I suspect, more common ground between these two positions than Armstrong seems willing to concede. The issue has two aspects, a linguistic aspect and an ontological or existential aspect. I take it that there is little, if any, disagreement over the linguistic aspect of the problem. Whatever view is taken on the issue of causal necessity discussed above, all parties to this debate would accept

- that to say that particular situation *A* was a cause of particular situation *B* entails the counterfactual:

If *A* had not existed or occurred, *B* would not have existed or occurred

and

- that to say that situations of the *A* type are liable, given appropriate attendant conditions, to cause situations of the *B* type, entails the counterfactual:

Given the same attendant conditions, if a situation of the *A* type had not or does not exist or occur, a situation of the *B* type would not have existed or occurred in the past and will not exist or occur in the future.

It also appears to be common ground that the truth of the particular counterfactual

If *A* had not existed or occurred, *B* would not have existed or occurred

is true if there is a true universal counterfactual or law statement of the form

Given that other attendant conditions are favourable, if at any time a situation of the *A* type were to exist or occur, a situation of the *B* type would concurrently exist or thereupon occur

from which it follows.

It would also be agreed, I suspect, that this deduction of the particular counterfactual from the universal counterfactual is of considerable epistemological significance. For since we can never observe a non-occurrent event or non-existent state of affairs, it follows that we can never have empirical evidence of the truth of a particular counterfactual statement. What we can have is empirical evidence which supports the truth of a universal causal counterfactual or law statement. This evidence, however, does not consist as Armstrong, following Hume, appears to think, in nothing more than the observation of either

- the regular occurrence of an event of the *A* type followed by an event of the *B* type, or
- of the coincidence or concurrence of a state of the *A* type with a state of the *B* type.

Regularities of this kind do not provide evidence of the truth of the counterfactual, unless they are accompanied by evidence that if *all other* attendant conditions are the same as they are on the occasions when a situations of the *A* type is accompanied by a situation of the *B* type, *and* there is no situation of the *A* type, there is no situation of the *B* type. Place's adherence to this view of the role of observed regularities as evidence for the truth of causal counterfactual is sufficient refutation of Armstrong's repeated attribution to him of a regularity theory of the truthmaker in causal judgments. At this point a significant difference between the two positions begins to emerge over the issue of the universal causal conditionals or universal law statements from which the particular causal counterfactual is derived. Place here follows Ryle¹⁵ in holding that particular dispositional property statements, i.e., statements ascribing a dispositional property to a particular individual over a limited stretch of time are "lawlike" statements. Such statements have the underlying form of a universal causal conditional:

Other conditions being favourable, if at any time as long as the disposition persists, a situation of

the *A* type (e.g. a suitable striking) were to exist or occur, a situation of the *B* type (a shattering of the glass) would or, in the probabilistic case, would be liable to exist or occur.

Such a particular dispositional statement which is universally quantified only with respect to instances or periods of time within the duration of the disposition is all that is required, as Nelson Goodman¹⁶ points out, in order to "support" a particular causal counterfactual. Armstrong, by contrast, appears to fall in with the more commonly held view that what is required here is a universal law statement universally quantified without restriction of time over individuals of a particular kind. Place does not deny that some universal law statements quantified over individuals in this way are true, but sees their truth as essentially parasitical on the truth of the particular dispositional statements which are subsumed under them.

This difference in view about what is needed to "support" particular causal counterfactuals is reflected in different views concerning the nature of the truthmaker whose existence makes the particular causal counterfactual true. According to Place the truthmaker for the particular causal counterfactual is the existence of a particular dispositional state (the peculiar brittleness of this glass). This state, moreover, is a non-categorical modal state whereby the object in question is, as it were, "pregnant" with a range of possible future outcomes, depending on such combinations of attendant circumstances as may arise in the future or might have arisen in the past. For Armstrong the truthmaker with respect to particular causal counterfactuals, is a Law of Nature considered as a universal unlocated state of affairs in the world. This state of affairs, he claims, is purely categorical. How such a state of affairs can be supposed to act as a truthmaker with respect to a counterfactual remains totally mysterious. He claims, if I have understood him correctly, that such a law of nature is an actually existing universal relation between actually existing universal properties. It nevertheless exists only in so far those (purely categorical?) relations and properties are instantiated. How something that exists only in so far as actual instances of it exist can act as a truthmaker with respect to what would happen or have happened, if things were to be or had been different from the way they are or were remains a mystery. For Place such an entity is a metaphysical monstrosity which helps us not at all to understand what it is that makes particular causal counterfactuals true. It no doubt achieves some degree of ontological economy as compared with Place's position in that there are far fewer universal law statements that are true than there are individual dispositional statements. On Armstrong's view, there is only one truthmaker required *per* universal law statement, whereas Place's view requires a separate truthmaker for each individual dispositional statement. But this multiplication of truthmakers, according to Place, is not *praeter necessitatem*.¹⁷

NOTES

1. B. Russell, 'The Philosophy of logical atomism', *The Monist*, 1918, xxviii, 495-527, and 1919, xxxix, 32-63, 190-222, 345-380. Reprinted in B. Russell, *Logic and Knowledge, Essays 1901-1950*. R.C. Marshall (ed.), London: Allen and Unwin, 1956.
2. G. E. M. Anscombe *Intention*, Oxford, Blackwell, 1957, pp. 37-47.
3. D. M. Armstrong, *Universals and Scientific Realism* (two volumes), Cambridge: Cambridge University Press, 1978.
4. *Parmenides* 132-3.
5. D. Hume, *An Enquiry concerning Human Understanding*.
6. S. Kripke, *Naming and Necessity*, Oxford: Blackwell, 1980.
7. Speaking causally, to say that one situation (the effect) is contingent upon another (the cause) is to say that the relation between them *is* causally necessary, not that it isn't. The opposite of causal necessity is not contingency, but causal independence or *non*-contingency. It is notable that in Kripke's formulation which confounds these two radically different forms of necessity the notion of 'contingency' disappears from view.
8. For this point, see the discussion of the example 'his table is an old packing case' on p. 46 of U. T. Place 'Is consciousness a brain process?' *The British Journal of Psychology*, 1956, 47: 44-50.
9. *op. cit.*
10. G. Ryle, *The Concept of Mind*, London: Hutchinson, 1949, pp. 123-124.
11. N. Goodman, *Fact, Fiction and Forecast*, Cambridge, MA: Harvard University Press, 1955.
12. *Le Malade Imaginaire*.
13. *op. cit.*
14. Taken together with Kripke's intuition that *Pain = C-fiber firing* is contingent and probably false, Armstrong's intuitions with respect to the necessity/contingency of these two type identity statements illustrate both Skinner's contention (B. F. Skinner 'An operant analysis of problem-solving' in B. Kleinmuntz (ed.) *Problem Solving: Research, Method and Theory*. New York: Wiley, 1966) that intuitive judgments are "contingency-shaped" (i.e., a matter of habit, in this case linguistic habit, based on long and extensive experience of getting it right and getting it wrong) and Place's (1956 *op. cit.*) contention that "if we lived in a world in which all tables without exception were packing cases, the concepts of 'table' and 'packing case' in our language would not have their present logically independent status. In such a world a table would be a species of packing case in much the same way that red is a species of colour." (Place, 1956, p. 46) Kripke's formula *Heat = molecular motion* is clearly defective in that, as argued below, it does not distinguish between heat as a categorical property of bodies to which it applies and heat as the dispositional property of imparting categorical heat to other bodies to which it does not. Nevertheless, the relationship between the temperature of a body and the rate of Brownian motion in its constituent molecules is sufficiently well-known and has been so for a sufficient length of time to have infected our linguistic intuitions to the point where the statement of equivalence has become analytic and necessary. *Gene = DNA* is still synthetic and contingent, because the co-extension of the two concepts has not been recognised long enough for it to have infected our linguistic

intuitions. In the case of *Pain = C-fiber firing* the process of analyticitisation has not even begun.

15. *op.cit.*

16. *op.cit.*

17. What this means is that the law statements of science have the same truthmakers as statements ascribing dispositional properties to the individual concrete particulars whose behaviour lies within the scope of the law, namely the existence of those properties. Although she speaks of 'capacities' rather than 'dispositions' and reaches her conclusion from a different direction, a similar view is defended by Nancy Cartwright in *Nature's Capacities and their Measurement* (Oxford: Clarendon Press, 1989).