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LECTURES ON THE METAPHYSICAL FOUNDATIONS OF EMPIRICAL PSYCHOLOGY

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Lecture 6 (Part 1)

Cosmology III. Dispositions

[with revisions from 1998]

This concluding section on the topic of explanation is concerned with a problem about the logic of dispositional concepts and their function in causal and reductive explanations which arises out of Ryle's account of dispositional concepts and their role in the psychological language of ordinary discourse in *The Concept of Mind* (6) but which, particularly as it has been criticised by Geach in his book *Mental Acts* (2), raises important problems about the role of such concepts in scientific explanation in general.

Ryle's account of dispositional concepts

Ryle's account of dispositional concepts and dispositional statements begins by citing a number of examples of predicates which he takes to be dispositional and hence to characterise "generic tendencies, capacities and liabilities" of the subject of whom they are predicated. His examples of dispositional statements containing dispositional predicates include:

Glass is brittle.	He is a smoker.
Sugar is soluble in water.	He is greedy.
Rubber is elastic.	He is a baker, grocer, solicitor, etc.
This wire conducts electricity.	He knows French.
Some stones (pumice) can float.	He is a swimmer.
Cows are ruminants.	He can swim.
Some animals hibernate.	He habitually draws on his right sock before the left.
Fido tends to get mange in the summer.	His hobby is fishing.
Fido tends to bark when the moon shines.	

In his critique of Ryle's view, Geach (3) introduces two other examples:

The piece of iron is magnetized. Opium has 'dormitive power.' (from Molière)

I myself (4) have used the example

The car has a large horse power.

Ryle's thesis with respect to dispositional statements of this kind is:

- (1) Dispositional statements do not refer to any kind of episode or occurrence which is taking place at the time to which or over which the statement holds true. To put it another way, dispositional statements do not entail the occurrence of any particular episode or event, or to put it yet another way, dispositions are states of affairs rather than events. They exist or obtain. They do not occur.
- (2) But although to assert the existence of a disposition is not to assert the occurrence of any event or episode, it *does* involve the assertion that events of a certain kind, though they need not be occurring now and may never do so, are nevertheless *liable* to occur in the future. These episodes or events the probability or possibility of whose occurrence is implied by a dispositional statement are called by Ryle the *exercises* of the disposition in question. Others, notably C. B. Martin, speak of the disposition's *manifestations*.
- (3) According to Ryle, not only does a dispositional statement not assert the occurrence of any specific episode or event, it does not assert the existence of any substantial categorical state over and above that constituted by the probability or possibility that manifestations of the disposition will occur.
- (4) Since dispositional predicates can occur in particular statements about particular individuals, dispositional statements cannot, in so far as they are particular, be said to constitute statements of a law. Nevertheless dispositional statements, whether universal or particular are said, by Ryle, to "resemble laws, in being partly 'variable' or 'open'" (6 p. 123).
- (5) Law-statements, and hence by virtue of their resemblance to law statements, dispositional statements, although they are true or false, "do not state truths or falsehoods of the same type as those asserted by the statements of fact to which they apply or are supposed to apply." A

law-statement, according to Ryle, is an "inference-ticket" which "licenses its possessor to move from asserting factual statements to asserting other factual statements" (6 p.121).

- (6) Another and perhaps less misleading way of expressing the same point is to say that law statements and dispositional statements, although the grammatical form of the sentences used to express them is usually categorical, are really what Ryle calls "concealed hypothetical statements." This is shown by the fact that it is always possible to paraphrase a law or dispositional statement by a sentence of the form 'if p then q ', the distinctive feature of which is that it does not by itself commit the speaker to the truth of either of the constituent statements p and q , but which, when combined with the assertion of p , allows the inference to q .¹

Geach's criticism of Ryle's account of dispositions

The first point that needs to be made about Geach's criticism of Ryle's account of dispositional statements in Chapter 3 of *Mental Acts* is that Geach is not denying that the examples that Ryle gives of dispositional statements are in fact examples of statements with dispositional predicates. Nor is he denying that the psychological verbs and adjectival expressions which Ryle regards as dispositional are likewise dispositional predicates. Nor is he denying Ryle's contention that dispositional predicates do not assert the occurrence of any particular episode, incident or occurrence, or the contention that dispositional statements assert the probable or possible future occurrence of the manifestations of the disposition in question. Moreover, Geach is not denying that there is a connection between dispositional statements and law statements. He does not deny that dispositional statements always entail some kind of law statement. He would also agree that law statements, and hence also dispositional statements, permit an inference from one factual statement to another, and that this feature of law statements can quite properly be expressed by saying that they have the underlying logical form of the hypothetical 'if p , then q .'

Geach's criticism turns on three points. Firstly, he rejects, at least implicitly, the rather slovenly way in which Ryle assimilates dispositional statements to law statements with his talk about dispositional

¹ [Footnote inserted 1998] I have recently changed my view on this matter. See my 'On the nature of conditionals and their truthmakers,' *Acta Analytica*, 1997, **18**, 73-88.

statements "resembling" law statements. According to Geach dispositional statements entail some kind of law statement, but the law statement which they entail is not all that they assert. In addition to asserting something hypothetical about what would or could happen, if so and so were the case, they also assert something categorical about the state of the substance of which the dispositional property is predicated, something categorical on which the truth of the hypothetical part of the dispositional statement depends. This, then, is the second point on which Geach differs from Ryle, namely in affirming what Ryle denies, that dispositional statements assert the existence of a substantial categorical state of the substance of which the dispositional property is predicated. The third point of difference is Geach's rejection of the implication underlying Ryle's account of law statements as "inference-tickets", the implication that law statements, and hence, dispositional statements, are not genuine propositions at all but have a kind of performatory or illocutionary function, as Austin (1) would say, of permitting a particular kind of inference to be drawn.

A critique of Geach's thesis

In examining Geach's account of dispositional statements and the arguments he gives for it, I shall begin by considering the arguments for the third of the three points on which he takes issue with Ryle. Geach's argument for the view that Ryle's description of law-statements as "inference tickets" is at worst mistaken and at best seriously misleading, is that universal law statements are just as much true or false as any factual existential statement. Furthermore, no formal propositional calculus could be constructed which did not allow propositions of the form 'if p then q ' or ' $p \vee q$ ' as genuine propositions on all fours with any other proposition for which the propositional variables p and q can stand. In fact Ryle does not deny that law statements can be and are genuinely true or false; in fact he insists that they are (6 p. 121). Nor does he say anything to suggest that they should not be treated as straightforward propositions when represented in terms of a propositional calculus. The talk of inference tickets may have unfortunate implications, if taken too seriously; but there is no reason to think that Ryle intends that it should be.²

² [Footnote added 1998] For a different and more recent view of this matter see Place (1997, *op. cit.*).

The problem of particular dispositional statements

Although his account of the difference between dispositional statements and law-statements differs from Ryle's, Geach does not put forward his own view as an answer to the problem of distinguishing these two kinds of statements as it presents itself to Ryle. Nor, indeed, does his thesis that dispositional statements involve an implicit reference to a categorical state on which the truth of the implied law-statement depends help to resolve Ryle's problem in this respect. The problem that bothers Ryle may be illustrated by comparing statements like 'Glass is brittle' or 'Sugar is soluble in water' with statements like 'This piece of glass is brittle' or 'This sugar lump is soluble in water'. Now it seems right to say that the former are law statements which apply universally to any piece of glass or to any piece of dry sugar; the latter by contrast are particular propositions concerning a particular piece of glass or a particular lump of sugar. Consequently, Ryle is very reluctant to describe the latter as law-statements. Geach's suggestion that dispositional statements assert the existence of a categorical state as well as implying a law statement is no help here, since both the universal proposition 'Glass is brittle' and the particular proposition 'this piece of glass is brittle' are equally dispositional. In my view the correct solution to Ryle's problem, as he himself partly recognises, is that a proposition which is particular with respect to the individual substance which constitutes the subject term of the proposition may nevertheless be universal and thus may quite properly be said to express a law with respect to the *occasions* on which it applies. In other words, as Davidson (2) has argued, we need to recognise both the possibility and necessity of quantifying over *events* as well as substances.

Dispositions and categorical states

The most important part of Geach's thesis with respect to dispositions are his arguments for the view that they assert the existence of a categorical state of the substance in question on which the truth of the hypothetical law-statements depends. He has two arguments. The first is the argument that whenever a scientist is presented with a dispositional property like the brittleness of glass, the elasticity of rubber or the magnetic properties of an iron bar, he invariably looks for and invariably succeeds in finding some internal

categorical state of the microstructure of the entity or kind of entity in question which explains why it is that if the glass is struck by or falls onto a hard surface it tends to break, why it is that if the rubber is bent or twisted, it bends and twists fairly readily and will rapidly recover its former shape once the pressure is released, or why it is that if iron objects are placed close to the iron bar they will be attracted towards it. His second argument is his contention that it is only by virtue of this explanation of the law-statement in terms of the internal categorical state of the microstructure that dispositional predicates can have any kind of explanatory role or function. This is the thesis which he illustrates by means of the example of the concept of the 'dormitive power' of opium which fails to explain the fact that opium puts people to sleep.

Conceptual and substantial reduction and the categorical basis of dispositions

I find both of these arguments unconvincing. The first argument, so it seems to me, depends upon a failure to draw the distinction which I tried to draw in Lecture 4, between conceptual analysis and reduction on the one hand and substantial, material or micro-analysis and reduction on the other. What Ryle is concerned with when he analyses dispositional statements in terms of concealed hypothetical law-statements is the conceptual analysis of concepts like 'brittle', 'flexible', or 'having magnetic properties'. What the scientist is concerned with is the substantial microanalysis of substances which have these dispositional properties. They want to explain the empirical fact that the substances in question possess the properties by virtue of possessing which they fall under the relevant dispositional concepts. They seek an explanation of that fact in terms of the distinctive microstructure of the substances in question. Indeed, whenever scientists have looked for a state of the internal microstructure of the substance in order to explain why the substance possesses the dispositional properties it does, this strategy has almost invariably paid off. But it is one thing to say that the dispositional properties of a substance can invariably be explained in terms of its microstructure. It is quite another to say that we are *talking about* the state of the substance's microstructure, whenever we describe it as having the dispositional property whose existence the microstructure explains. We can all recognise and describe something as being brittle, flexible or magnetised without having the slightest idea as to what sort of internal microstructure such things have or how this state of the microstructure can explain why it has these properties.

The explanation of facts and the explanation of phenomena

Geach's second argument for the view that dispositional concepts involve reference to an internal categorical state of the substance that possesses the disposition is not so much an argument as a rhetorical device. It turns on an allusion to Molière's *Le Malade Imaginaire*, where a pompous physician offers the "dormitive power" of opium as an explanation of the fact that taking it tends to put the taker to sleep. As used in this context, the implication is that 'dormitive power' fails as an explanation because it is an empty dispositional concept which is not backed up by any theoretical account of its operation at the microstructural level. This implication is conveyed in part by the use of the antiquated and outmoded term 'dormitive power' to describe the dispositional property of the drug whereby it tends to put those who take it to sleep. A modern pharmacologist would speak instead of the drug's 'hypnotic properties', meaning the same thing. But because the etymology of the adjective *hypnotic* (from the Greek ὑπνος sleep) is less obvious than that of *dormitive* (from the Latin *dormire* to sleep) the tautologous nature of the explanation is much less apparent if you say

‘Opium puts people to sleep, because of its hypnotic properties,’

than if you say

‘Opium puts people to sleep, because of its dormitive power.’

However, a more substantial factor in creating the impression that it is the lack of a microstructural backup which makes the dormitive power explanation appear as vacuous as it plainly is, is the failure to distinguish between two different type or levels of explanation involving the ascription of dispositional properties to the substances concerned. This is the distinction between an explanation of a *phenomenon* and an explanation of a particular *fact* to which I drew attention in an unpublished thesis, submitted to the University of Adelaide in 1969 for the award of the degree of Doctor of Letters (5).

"By a phenomenon here I refer to the sort of relationship between events that is expressed in an empirical generalisation and whose existence is verified by systematic and repeated observation

or by some kind of test or experimental procedure. By a fact I refer to an individual event or occurrence which is observed on a particular occasion. Any fact in this sense is an instance of some phenomenon, and the observations that combine to establish the existence of a phenomenon are observations of individual facts. When we explain facts in this sense, we usually explain them by showing that they are instances of an empirical generalisation which describe a phenomenon of which the fact in question is an instance. Explanations of facts, in this sense, occur very frequently in ordinary non-technical discourse, and are of special importance in legal contexts, in clinical medicine and in technical enquiries into the causes of accidents and disasters. In pure science and in many fields of applied science, explanations of individual facts are conspicuous by their absence. Scientists, for the most part, are concerned with explaining phenomena. Considerable care and attention is devoted to precise observation of individual facts; but the object of this is not to be able to explain those facts considered as isolated occurrences. Its purpose is to define as precisely as possible the phenomenon of which the facts in question are an instance. Only when the phenomenon has been precisely specified, does the question of a scientific explanation of the phenomenon arise.

"Now a dispositional property in terms of this distinction is a phenomenon. It is an observed relationship between events or occurrences. It can, therefore be used with perfect propriety to explain the individual facts that constitute instances of it. Thus we can explain the fact that the glass broke when the stone struck it by referring to the brittleness of glass; we can explain the fact that pins collected on the iron bar by the iron bar's being magnetised; we can, if we don't mind using archaic language, attribute the fact that the man went to sleep after smoking opium to the dormitive power of the drug; and we can attribute the speed with which the car climbed the hill to its large horsepower. By the same token we can explain Dr Johnson's standing in the rain in Uttoxeter market place (3 p.8) by his wish to do penance. What we cannot do is to explain a phenomenon itself in other words. That is what is wrong in Geach's (3 p. 5) example

where the dormitive power of opium is used to explain the fact that it puts people to sleep.

This example does not show, as Geach seems to think, that dispositional concepts like 'dormitive power' have no explanatory use. It only shows that a dispositional property cannot be used to explain itself.

"At this point in his argument Geach creates further confusion by comparing this case where a dispositional property is explained by itself under another description with the case where the physicist is faced with the problem of explaining the phenomenon of magnetism. Here we are dealing not with the use of dispositional properties to explain other things, but with the scientific explanation of the dispositional property itself. In the example he chooses it is true that the scientific explanation of the dispositional property involves the postulation or discovery of some underlying categorical state of the object that has the property. But this does not show what he seems to think it shows, namely that the explanatory utility of concepts like 'brittleness' and 'being magnetised' derives from this underlying categorical state. For the underlying categorical state, the molecular structure of the glass or the atomic structure of the iron bar, does not explain the same thing that dispositional properties themselves explain. Dispositional properties like brittleness and being magnetised explain individual facts like the glass shattering and the pins collecting on the bar. The molecular structure of the glass and the atomic structure of the iron explain the brittleness and the magnetic properties" (5 pp.16-18).

This view of the role of dispositional properties as *explicantes* in explanations of particular facts, and as the *explicanda* in the case of explanations of phenomena, besides its value in helping to rebut Geach's criticism of Ryle's account of dispositions, also has important consequences for the theory of explanation in general:

- (1) It provides us with an important principle in terms of which to classify scientific explanations and theories according to whether or not their function is to explain particular events which occur on particular occasions or phenomena which recur in a regular lawful way.

- (2) It implies that explanations and theories which make use of the dispositional properties of the substances whose behaviour is being explained will be concerned with the explanation of particular facts and events, whereas those which involve a substantial-material analysis or reduction of a substance into its constituent parts will be concerned with explaining the phenomena constituted by its dispositional properties.
- (3) As we saw in Lecture 4, the intrinsic properties of a unit at a given level of micro-reduction are theoretically explicable in terms of the properties and arrangement of the micro-units of which it is composed. Since these intrinsic properties will usually, if not always, be dispositional properties, it follows that the explanation of phenomena and theoretical micro-reduction will be largely, if not wholly, coextensive.
- (4) By the same token, the partial explanation of the form or arrangement of units at a given level of micro-reduction in terms of the intrinsic properties of those units will be largely co-extensive with the explanation of particular facts in terms of the dispositional properties of the units to which they relate.
- (5) It draws our attention to the fact that when a micro-reductive explanation of a dispositional property is given, what is reduced or analyzed into its constituent parts is not the dispositional property itself, but the substance to which the dispositional property belongs. The dispositional properties are susceptible to conceptual analysis along the lines suggested by Ryle, but in themselves they are not susceptible to substantial micro-reduction.

Dispositions and Causation

Finally something needs to be said about the relation of the concept of a dispositional property and the concept of causation which we were discussing in Lecture 5. We saw, you will remember, that to assert a particular causal judgement to the effect that state or event *A* caused state or event *B*, entails

- (i) that the cause event or state *A* occurred or was the case concurrently with or in close temporal proximity to the effect event or state *B*, and

- (ii) a universal principle or law whereby, *ceteris paribus*, a state or event of the same general type as the effect event or state *B*, is invariably accompanied or preceded by an event or state of the same general type as the cause event *A* or preceded by an event or state of the same general type as the cause event *A*.

Now if Ryle is right, as I have argued he is, in holding that dispositional statements are law-statements, it follows that in many, if not in all cases, the universal law statement implied in a particular causal judgement is susceptible to formulation in terms of the dispositional properties of the substance or substances involved. Take, for example, the hardness of the stone and the brittleness of the glass both of which enter into the law statements specifying the conditions under which hitting by the stone will cause the glass to break.

However, there is also another way in which dispositional properties enter into causal relations in that particular dispositional states, as we may call them (i.e. particular instantiations of dispositional properties) may also be regarded as causal factors in their own right. Thus we may say that the brittleness of the glass caused it (the glass) to break when the stone struck it. This is perfectly acceptable if, as I have argued, all we are saying, when we say that the brittleness caused the glass to shatter, is that if it had not been brittle, it would not have shattered under these conditions.

All these considerations, as we shall see later, have important consequences when we come to consider the explanatory function of those mental concepts which are dispositional in character.

References

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