CAUSATION AND THE MIND:

METAPHYSICAL PRESUPPOSITIONS IN THE PHILOSOPHY OF MIND

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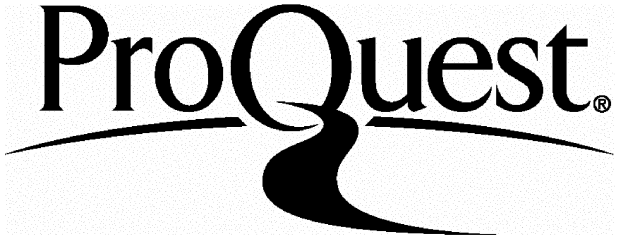

CONTENTS

ABSTRACT

Mental causation and relationship between the mental and the physical are central issues in the philosophy of mind. This thesis investigates whether these disputes have been mislocated and can be traced to disparate metaphysical commitments which often remain implicit, such as ontological or conceptual disagreements, or to more primitive clashes of pre-theoretical intuition. To this end, the thesis aims to demonstrate the extent to which presuppositions about metaphysics and the philosophy of science, specifically those concerned with the characterisation of causation and explanation, influence the formulation of theories of mind.

Two principal alternative proposals about the metaphysics of causation and explanation are discussed. These crucially diverge in their choice of causal ontology: in the first, causes and effects are taken to be properties or their instances (or structured complex entities partially constituted by these, such as facts); in the second, causes and effects are concrete particulars, most usually events. The difference between these options is, I suggest, not merely a disagreement about what causes are, but also leads to fundamental conflicts about the nature and ontological status of explanation, laws of nature and the properties which these connect, which, in turn, provides fertile ground for philosophical misunderstandings to arise.

The two accounts are individually evaluated and then compared, initially with regard to their internal consistency, coherence, explanatory power and intuitive plausibility, and then with respect to their implications for the philosophy of mind. Although some metaphysical variations are found to be untenable, I conclude that both property theorists and event theorists can accommodate mental causation and provide an account of the relationship between the mental and the physical. However, since the property theorist is far more restricted in the account of the mind he can offer and requires more primitive, unanalysable presuppositions to sustain his metaphysical picture, I argue that the most credible causal ontology is one based upon events.

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INTRODUCTION

0.1 The Suspicion

The motivation to write this thesis arose from a suspicion that many lively, but seemingly intractable, philosophical debates are perpetuated by disagreements which have little to do with the subject central to the debate in question, but can be traced back to differences elsewhere in philosophy. Of course, one can always diagnose failure of intellect, or some kind of dogmatic stubbornness as reasons for the failure of one side to see any plausibility in the other's view, or for the persistent conviction that if only one explained one's position a little more, the philosophical opposition would eventually get the point. But, although these features undoubtedly do have a role to play in contributing to philosophical frustration, it would serve philosophy better to avoid these uncharitable, *ad hominem* diagnoses, and adopt the investigative outlook that at least some cases of philosophical stalemate are symptomatic of significant differences of opinion from other quarters. Most frequently perhaps, they involve presuppositions concerning fundamental metaphysical issues, which enjoy so broad an application across diverse areas of philosophy that one is predisposed to take some analysis for granted, rather than become embroiled with these secondary issues which seem far from the point.

If my suspicion is correct, then there are important cases where such 'secondary' issues actually *are* the point, and a failure to see this on the part of many philosophers (with a few notable exceptions[1]) leads to the frustration of theoretical progress in areas as disparate as the philosophies of mind, mathematics, language, ethics and aesthetics. Certain metaphysical background assumptions – about the nature and status of the ontological categories in play, the relations which hold between these, and the analysis of notions such as causation, explanation, physical, natural and the like – have such a broad range of application as presuppositions for further theorising that disagreements about these matters pervade other areas of philosophical discourse. The philosopher who reiterates the same, apparently untenable position so often that the reader begins to detect an irritable tone may not be guilty of adhering in vain to a hopeless doctrine but of failing to appreciate how deeply the disagreement with his opponents cuts.[2]

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[1]Recent examples of philosophers who share my suspicion and attempt to confront the issue within the philosophy of mind include Lowe (1996) and Steward (1997).

[2]The use of 'his' here is sadly not attributable to some unreflective bias of traditional English usage – as will become apparent I favour the use of either 'she' or 'he' where gender is irrelevant – but is due to the fact that published philosophy is presently male dominated. I look forward to the day when this imbalance is rectified to the extent that I might have grounds to alter the pronoun in sentences about philosophers in general.

The prevalence of such difficulties is perhaps a relatively modern problem, it no longer being practical or possible to attempt to consider the whole of philosophy – even less so the totality of human knowledge – and so to do philosophy by attempting a 'Theory of Everything' is a philosophical approach which has unavoidably been forced out of fashion. Although some modern philosophers do present integrated systems which cover a vast range of philosophical disciplines in the tradition of Aristotle, Leibniz or Hume, the fragmentation of areas of discourse is inevitable as the domain of study widens, if any kind of in-depth engagement with the issues is going to take place. In Putnam's words, 'a division of intellectual labour' is required. This division, I suggest, although the only fruitful way to expand knowledge in the face of such immense diversity, is also sometimes detrimental to this expansion, since the fragmented areas of study are not self-contained. Indeed, some regard the consequences of this intellectual fragmentation in a considerably more solemn light, as having social implications, in addition to those philosophical ones with which I will be concerned. Bohm, for instance, contends that 'the attempt to live according to the notion that the fragments are really separate is, in essence, what has led to the growing series of extremely urgent crises that is confronting us today.'[3] One does not have to follow such thinkers to their more expansive and contentious conclusions however, in order to concede that the fragmentation of subject matter and modes of enquiry permits oversights about the inter-connections between disciplines and allows that assent to general presuppositions need not be made explicit, not only to the reader, but also to the philosopher herself.

The philosophy of mind, which will be the focus of the following discussions, appears to be replete with conflicts that essentially hinge upon consideration of something else. For instance, the question as to whether psychophysical supervenience, realisation or dependency implies the existence of psychophysical laws, and whether it is thereby inconsistent with Davidson's principle of mental anomalism, has much less to do with the nature of the mental and the physical than with the issue of what it is to be a law of nature.[4] Similarly, divergences over the status of properties and laws underlie debates concerning the reducibility of mental entities to physical ones, since on many views reducibility requires bridge laws to connect the two domains and there is wide disagreement as to the acceptable forms which these may take. A third area which appears to be afflicted by the unreflective acceptance of diverging presuppositions is the more general topic of the explicability of the mental, the very possibility of explaining mental phenomena such as consciousness, qualia or intentional states in physical terms, and whether the explanation of such phenomena is important.[5] Behind this debate lie not

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[3]1980, 2.

[4]See Kim (1985; 1993, *passim*) on Davidson (1970).

[5]Among those philosophers who deny, or are pessimistic about, the explicability of consciousness are Nagel (1974; 1998), McGinn (1991), Jackson (1982; 1986) and Chalmers (1995). Opposition to their views

only the considerations regarding the nature of properties and laws mentioned previously, but also an impressive amount of implicit disagreement about the notion of explanation itself – what it is for something to explain something else, and when such a relation obtains – in addition to issues surrounding the structure and inter-relations of theories, and the connections obtaining between the entities which these theories concern. Fourthly, similar concerns appear to underlie the evaluation of accounts of mental causation, attempts to vindicate the causal efficacy of the mental within a physicalist framework against the charge of epiphenomenalism. Here, conflicting views about the analysis of causation, and therefore what it would be for the mental to be efficacious, plague the assessment of positive proposals. Fifthly and finally, a more general difficulty affects the doctrine of physicalism, which is adopted by the majority of modern philosophers of mind as the paradigm within which they are working. By many, this is presumed identical with monism in opposition to some form of Cartesian substance dualism and yet physicalism is a doctrine which remains hopelessly ill-defined. In the absence of explicit clarification, the truth of such a doctrine and the implications of its acceptance are impossible to evaluate, leaving theories of mind purportedly consistent with this supposedly unified doctrine at odds with each other for reasons which have little, or nothing, to do with the mind.[6]

This list is not exhaustive, nor have I offered more than cursory reasons to convince the reader that the aforementioned five debates are afflicted in the way that I suggest. But a list like this one could never be exhaustive, since the scope of application of the concepts which I have picked out as requiring clarification is so broad that acceptance of the existence of underlying confusions in a single one of the debates listed creates a domino effect of advancing confusion through other areas of philosophical discourse. Perhaps, also, the study of the mind is more severely afflicted than other areas of philosophy by clashes of metaphysical presuppositions or, even worse, by the complete absence of coherent metaphysical grounding, since the rejection of Cartesian dualism pulled the rug out from under the accepted ontological basis of mentality, which dealt with the nature and properties of immaterial, mental substance. Helen Steward remarks that, although most philosophers accept Ryle's denial of the existence of 'the Ghost in the Machine',[7] few would concur with his positive proposal to limit the study of mind to semantic matters.[8] Investigation of the *concepts* which make up the mental, such as those of belief, desire and the like, may provide some illumination as to the nature of mentality

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has been expressed by Churchland (1984), Dennett (1988; 1991), Flanagan (1992), Garvey (1997) and others.

[6]I am not alone in calling for the clarification of this particular philosophical position; see, for example, Crane & Mellor (1990), Crane (1991; 1992) and attempts to answer these charges by Papineau (1991; 1993) and Spurrett (1999).

[7]Ryle (1949, 17).

[8]1997, 1.

but many feel that there is more to be said than this. The old problems associated with the mental, such as explicating the nature of the relation between the mental and the physical, explaining and predicting action, and accounting for human autonomy or free will, remained after the Cartesian paradigm had been shifted, but there has been surprisingly little philosophical concern as to what should be put in its place.

The difficulty to which I am drawing attention is not that the protagonists in these debates fail to share a *common* metaphysical background theory – for reasons given below this is more than could possibly be expected both of the theory and of the individual philosophers themselves. Rather, the central problem is that the presuppositions in play concerning ontology and metaphysics are rarely made explicit, nor is there much conviction that they should be so, although it seems clear that closer scrutiny to this area of theorising could avert some long-running battles of hard stares. In doing so, we may uncover much agreement concealed behind apparent disagreement, and perhaps put paid to some completely inconsistent or implausible positions along the way. A comparison of Leibniz and Hume on the subject of free will, for example, yields much similarity once the differences created by their wildly divergent metaphysical schema have been taken into account.[9] But one cannot account for such differences, if one does not know where they lie. As I noted above, greater specialisation is demanded in modern times to make in-depth study manageable, but this demand of specialisation is a double-edged sword: in omitting problems from an area of discourse as irrelevant or peripheral, the exposure and clarification of very relevant points of conflict is in danger of being ignored.

0.2 The Method

Having begun with this diagnostic observation about the current plight of some areas of philosophy, there is a choice of two methodological directions in which I could depart. The first would be to continue and expand upon the diagnostic strategy, exploring the five problems in the philosophy of mind which were briefly enumerated on the list above, to discover more exactly in which philosophical debates they occur and the range of influence of such confusions; then moving on to locate similar controversies in other areas of philosophical discourse which may also be attributed to differences in the implicit theoretical background, rather than to differences within the terms of the debate itself. One could even, bravely, try to formulate some diagnostic test to detect such difficulties, in the spirit of Hume's attempt to 'subvert that abtruse philosophy and metaphysical jargon' with his empirical method of enquiry, echoed in this century by the work of the Vienna Circle, in Ayer's 'Principle of Verification' and Bridgeman's operationalism.[10]

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[9]Leibniz (1686); Hume (1777, ch. viii).
[10]See Hume (1748, 12 and ch. i, *passim*); Ayer (1936, 5); Bridgeman (1927).

However, I happily admit to having little idea as to whether or how such a generally applicable test could be devised, especially in such a way as it not, in common with Ayer's principle, be self-refuting by falling foul of its own constraints. Furthermore, in disanalogy with the way in which the empiricists perceived their task, merely locating the occurrence of the confusions which I have described would not provide a solution to them: they are not to be rejected as problems unworthy of philosophical consideration, in the manner of Hume's abtruse metaphysics, but as alternative philosophical bases to certain problems which do admit to serious philosophical consideration. Thus, the purely diagnostic approach, although useful for the purposes of identifying and untangling long-standing philosophical debates and locating the crux of the problem elsewhere, would fail to indicate the direction which a positive solution could take. It is one thing, for instance, to declare that the debate over the possibility of psycho-physical laws is dependent upon what a scientific law, or law of nature, is taken to be, but quite another to evaluate which conceptions of law are plausible and therefore which of the competing conceptions should be adopted independently of considerations about the mind.

To make suggestions of this kind requires something more than the descriptive, diagnostic approach I have been considering, since decisions regarding fundamental ontology, the status of laws, the accounts which are to be given of causation, explanation, physicalism and so on, cannot be made in isolation from each other, but must form consistent parts of a wider metaphysical schema. Therefore, in preference to chasing some, most probably chimerical, general test with which to ascertain that particular philosophical debates are insoluble in the area of philosophy in which they appear, I shall leave the discovery of further cases aside and embark in a direction which may offer some hope of eliminating some of the metaphysical positions which make such confusions possible in the first place. In doing so, the course of this thesis follows a winding path, investigating rival metaphysical systems both with respect to their consistency, coherence and the primitive presuppositions they require, and with regard to their implications for the philosophy of science and mind. This begins with the evaluation of competing accounts of causation and explanation, examining the entities involved in theorising and how they are related to each other; firstly, contrasting them in general terms and then, in the light of the conclusions drawn, moving on to reinvestigate the prospects within each system for a workable theory of mind.

There are, of course, limitations to this method, the first of which arises from the character of metaphysical theorising itself. When talking in general terms about the nature of fundamental ontology for example, the basic categories of entities which play particular roles within a metaphysical schema and the way these are related, the choice between alternatives ultimately relies much less upon the truth of the doctrine, for that is

perhaps impossible to determine, than upon the utility of the system, how well it is able to provide a workable framework within which to fit our more specific philosophical theorising about the mind, science, language, aesthetics, morality, social science and so on. To put the point in less grandiose terms, the study of ontology and metaphysics has less to do with seeking the truth and more to do with shopping in an overstocked supermarket: the choice of acceptable versions is so great and there is little to choose between the alternatives, so it is only by consideration of the particular purposes for which entities are required, mixed with a liberal dose of stipulation, that any decision can be made at all. The call for justification must end somewhere: each account that I consider will be forced to leave some fundamental facts more or less unexplained. Common-sense intuitions about fundamental entities such as objects, properties and events are too sketchy to provide anything more than a superficial guide to choice, and philosophical intuitions almost invariably clash; if they did not, the problems of incompatible presuppositions underlying theories of mind which I have described would not arise. Having said this, one does not want a metaphysical schema packed with utterly implausible entities bearing strange or fantastic relations to each other, even though that system might fulfil the role of being a sound metaphysical basis upon which to theorise about science and mind. The task at hand is to tread carefully between these extremes, minimising stipulation, while maximising the intuitive plausibility and utility of the system for grounding areas of philosophical discourse and it is this which I must endeavour to do.

However, in doing this, another unavoidable difficulty with the approach I have chosen will become manifest, since I cannot hope that the choices which I make will themselves be untroubled by dogma and the very metaphysical presuppositions which I hope, to some extent, to minimise. To attempt to avoid any such presuppositions completely would be tantamount to a refusal on my part to make any choices at all, and embark upon an infinitely chaotic manuscript which diverges to consider the implications of contrary decisions at every possibility, in the manner of the temporally branching novel described by Borges in 'The Garden of the Forking Paths'.[11] Although I admit that there will be sometimes little to choose between the possibilities which I ignore and those which I develop, and that, as a result, some readers may feel that their philosophical positions have been sold short, I can only apologise in advance for this, since the virtues of a finished manuscript far outweigh the presentation of many partially developed theories.

[11]Reprinted in Borges (1964, 44).

0.3 The Plan

In order to begin with as few initial constraints as possible upon the type of theoretical system which results, the discussion commences with an investigation into contrasting accounts of causation. These are essentially differentiated by the nature of the entities occupying the role of causes and effects and thereby diverge in their analysis of the relationship between singular instances of causation considered in isolation, and causal laws and causal explanation. Chapter One deals in general terms with the different perspectives from which the analysis of causation can be approached and attempts to lay out some general desiderata for an account of causation.

Chapter Two moves on to consider one species of candidate for the role of causes and effects, entities which can be grouped together as *abstract particulars*, but are more readily recognisable by other names, such as property-instances, tropes or modes. In order that these individual, unrepeatable qualities not be bare particulars, their constitutive identity and individuation conditions must be parasitic upon general properties or universals, or upon a fundamental objective standard of similarity and difference. This leads to a discussion of the extremely close relationship between property-instances and nomic connections, the causal relations between properties which make causal laws true; it seems that whatever theory of causation the property theorist comes up with, causation will turn out to be an essentially nomological phenomenon. Following Lewis, I suggest that the identity and individuation of a fine-grained ontology of properties suited to playing the role of causes and effects requires a primitive and unanalysable assumption – The Natural Properties Principle – that the world is objectively divided into sparse natural properties. Alternative formulations of this principle are available, such as presupposing the existence of a objective standard of similarity and difference – a 'similarity metric' – or, that the world is causally governed by a unique, sparse set of nomic connections. In short, the property theorist must presuppose that nature has qualitative joints.

Chapter Three evaluates how well the property theorist's account of causation fares when it is brought out of metaphysical isolation and put to work as the ontological basis of the study of science and mind. Because of the extremely close relationship between properties and nomic connections, difficulties which have commonly been thought to afflict a realist construal of the latter spread to the former as well. Nomological property causation is prone to being chronically affected by Classificatory Scepticism, which contends that there is next to no chance that our fundamental theories carve nature at its qualitative joints, and that their doing so would be an amazing coincidence with no way of ascertaining that this was the case. Two strategies in reply to the classificatory sceptic are then considered: that the sceptical argument may either be disarmed by the scientific

realist project; or that its conclusion may, like those of radical scepticism, be ignored and another primitive presupposition made that our theories *do* cut nature at its qualitative joints. I argue that the latter strategy is weak and the additional epistemological presupposition threatens to undermine the motivations behind the scientific realism it was invoked to defend. On the other hand, I suggest that the prospects for scientific realist project are not especially promising either. At the very least, these difficulties lead me to judge that abstract particulars are not suited to occupying the role of causes and effects, the fundamental ontology of a theory of singular causation. Despite being pessimistic about there being a satisfactory resolution to these criticisms, however, I go on to evaluate the application of this rather popular account of causation to the study of mind. If physics is a complete,[12] causally closed system, then it seems that the property theorist will be troubled by difficulties with mental causation, unless mental and physical properties can be type identified.

In Chapter Four, the thesis moves into its second phase where the plausibility of an alternative category of entities as causes and effects is discussed, that of concrete particulars including particular objects and events. These, it is argued, admit to coarse grained individuation in spatio-temporal terms, making them immune to the Classificatory Scepticism which afflicted the causal ontology of abstract particulars, discussed in the previous chapter. I consider possible counterexamples to the thesis that events and objects are suitable as the relata of singular causation and find them to be inconclusive, leaving the way open for a theory of singular causation to proceed.

Chapter Five begins by answering the inevitable objection to the account of event causation presented that it too will be susceptible to some form of sceptical argument similar to that which makes the property-based account of the metaphysics of causation seem unattractive. The question of how event causation is linked to causal explanation is discussed; in the first instance, when the theory of properties described in Chapter Three is adopted in conjunction with event causation. This combination is found to have extremely problematic implications when applied to the study of mind, in that it either cannot account for mental causation, or for the relationship between the mental and the physical. In light of these difficulties, I suggest that the event theorist would do better to abandon the realist construal of properties in favour of a more cautious alternative, which is agnostic about whether nature has qualitative joints. I attempt to sketch a cautious property theory, which does not create difficulties for event causation in the philosophy of mind, but which accounts for both causation and causal explanation.

[12]The terminology here is due to Papineau (1991; 1993).

The Conclusion compares the two theories of causation and explanation developed in the previous chapters and reflects on the problems associated with the mind which it was hoped they would resolve. The suspicion voiced at the beginning of this thesis does indeed have firm foundations, in that many debates which occur within the philosophy of mind may be dissolved when presuppositions regarding causation and explanation are examined. Also, some seemingly innocuous accounts of the metaphysics of causation have been found to be the source of difficulties usually located in the philosophy of mind. Although the problem of mental causation can be resolved within accounts of the causal ontology which employ either events *or* properties, theories of causation based upon the latter require a greater amount of primitive presupposition in order to produce a coherent account of causation in the first place. Moreover, such property-based accounts of the metaphysics of causation also severely restrict the form which a plausible theory of mind may take, and create difficulties for the defence of psychological explanation against those who seek to eliminate psychological discourse in favour of explanation in purely physical terms. On the basis that we should accept the metaphysical theory which both minimises unanalysable assumptions, and maximises the way the world may, on *a posteriori* investigation, turn out to be, it seems clear that an ontology of events which eschews a realist construal of properties is the most favourable option available. I conclude, therefore, that event causation is the most plausible basis upon which to found philosophical accounts of science and the mind. One corollary of my method and conclusions, however, is that there are no doubt other ways of dismissing problems about the mind, and so I wait with interest to learn of how this can be done.

CHAPTER ONE

THE METAPHYSICS OF CAUSATION

1.1 A Method for Metaphysics

The phenomenon of causation presents philosophy with one of its most persistent challenges, although this persistence does not arise through want of attempted solutions. Innumerable philosophers have endeavoured to characterise and analyse the everyday notion that some things appear to make other ones happen, and the results of their deliberations encompass the full spectrum of philosophical standpoints and traditions, each one having its peculiar strengths and weaknesses. In the shadow of all this history, it is difficult to see what it would be to provide a successful account, or at least one which illuminates or improves upon past mistakes.

The long history of the subject also puts an exhaustive, comparative study of the literature on causation out of the question, so this account will be selective about the issues and opinions it covers. In so selecting, however, I hope to touch upon all the bases relevant to the formulation of coherent accounts of mental causation and explanation. Broader issues concerning the assessment of metaphysical theorising in general will also be brought to the surface, as specific proposals for the characterisation of causation are discussed. I will begin by making some methodological remarks about the two different perspectives from which the study of causation can be approached. I will then attempt to bring the problem of characterising causation into sharper focus by devising a manageable starting position, and setting out some intuitive desiderata of a theory of causation: what, pre-theoretically, do we think causation is? Of course, some of these intuitions may prove to be unfounded, or turn out to be inconsistent with each other, and so may not survive the arguments which follow. However, unless my philosophy has entirely taken leave of common sense, I doubt that what follows will show them all to be false.

1.2 Questions of Causation

At the outset, an enquiry into causation is surrounded by a bewildering array of questions, the answers to which must be provided by any suitable account. Choices made as to the scope and relative importance of particular issues are directed both by interest and philosophical imagination, with the resulting accounts of causation ultimately being constrained by them. In this respect, I do not dare to pretend that this attempt will be any different, since I do not suppose that it could be, although the optimistic aim of this

exercise is that some of the fundamental differences which create divergence and clashes between alternative theories of causation will ultimately be revealed. Furthermore, since an adequate account cannot be self-contained but must fit into a broader theory, the relationships between causation and other, related concepts also require explication. In particular, proximate matters such as the nature of the entities involved in the causal process, the characterisation of natural or scientific laws, and the implications which differing accounts of causation have for the related analysis of causal explanation, and explanation in general, will be addressed before the account is applied to the study of the mind.

In giving an account of causation, there appear to be two perspectives from which the problem can be viewed: one can concentrate on the *relation* of expressed in a report of causation, and attempt to redefine it in non-causal terms; or one can examine the entities involved, attempt to determine the fundamental ontology, and then consider how these connect with each other when they appear in a causal sequence. The former option involves an immediate attempt to analyse what determines the truth of a causal statement 'A causes B', either in general where 'A' and 'B' are types or kinds of entities grouped by relations of similarity, or for *singular* causation, where each causal sequence is regarded as existing in isolation and 'A' and 'B' pick out unrepeatable particulars. There is no shortage of proposals for an analysis of causation of this type and a selection such claims follow.

1.2.1 Analysing and Defining Causation

Firstly, a case of singular causation 'A caused B' is true if and only if the existence of A *raises the chances of* the existence of B, that is, the existence of A makes the *probability* of B's occurrence higher than it would have been without A.[1]

Secondly, a collection of views representing what Sosa refers to as 'the nomological model' maintain that a singular causal statement 'A causes B' is true for particular entities A and B iff the causal sequence is identical with, or an instance of, a nomic connection, where nomic connections are necessary connections which makes laws of nature true, such as irreducible relations between universals, for instance.[2] On this view, the relations

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[1]Rosen (1978), Suppes (1984, 151-168), Mellor (1995, 67 and *passim*). Strictly, Mellor says that 'causation's connotations require every cause to raise the chances of its effect' (1995, 67); whether he intends this to amount to a definitional reduction is not clear, since Mellor claims not to be attempting an 'analysis of causation' but a 'substantial metaphysical theory of it' (1995, 5).

[2]The characterisation of a nomic connection is due to Armstrong (1983, ch. 6), although 'law of nature' rather than 'nomic connection' is his favoured term. More importantly, Armstrong is *not* one of the adherents to this view as he admits the logical possibility that a singular sequence 'Fa causes Gb' may be causal without instantiating a relation between universals; that is, it is not causal *in virtue of* instantiating a necessary connection between F and G. It appears that he admits this possibility, however, only because he

which obtain between cause and effect in any singular cases of causation are always instances of general necessary connections, which hold across similar cases and fundamentally govern the way the world works.

Thirdly, a close relative of the second analysis denies the existence of nomic connections in the world, the truthmakers for causal laws, but holds that for 'A caused B' to be true, the conjunction of A and B instantiates a causal law all the same. On this weaker view of laws, "Humean" in spirit, laws are nothing over and above instances of regularities or uniformities, rather than the fundamental necessary connections which appear within the previous account.[3]

Fourthly, another broadly "Humean" analysis of the causal relation takes Hume's second definition of causation for its starting point: 'A caused B' is true iff 'the first object had not been, the second never had existed'.[4] The relation of causation between A and B is analysed in terms of the causal dependency of B upon A, which in turn is analysed in terms of counterfactual dependency.[5]

Fifthly, causation may simply be regarded as a species of explanation: a cause *explains* its effect.[6]

Sixth, the production of an effect by a cause may be analysed in terms of *necessary and sufficient conditions*: a cause ceteris paribus is a necessary condition for its effect[7]; or a cause ceteris paribus is a sufficient condition for its effect[8]; or both.[9]

Seventh, instances of *singular* causation may be analysed in isolation from comparison with other cases, or general causal laws which hold over similar causal sequences; instances of a particular A causing a particular B may be analysed in terms of A being a change which is sufficient for, and contiguous to, another particular change B.[10] These accounts are sometimes grouped together as the 'singularist approach', which is motivated by Ducasse as a response to Hume's worry over his first (regularity) definition of causation as being 'drawn from circumstances foreign to the cause'.[11]

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cannot see how to prove otherwise (1983, 95). The nomological model is advocated by Honderich (1988, 28).

[3]The scare quotes indicate my reservations about attributing this view to Hume, although the basis for this analysis of causation and laws is to be found in Hume's first definition of causation (1777, ch. vii).

[4]Hume (1777, ch. vii).

[5]Lewis (1973).

[6]Owens (1992).

[7]Nagel, E (1961, 559-60).

[8]Mill (1879, bk. iii, ch. 5), Hempel (1965, 349), Popper (1972, 91).

[9]A similar, but slightly more refined version of this view is developed by Mackie (1965).

[10]Ducasse (1926, 127).

[11]Hume (1748, sect. 7.2); Ducasse (1926, 130).

Eighth, in a more scientific vein, causation is held to be reducible to a physical property or relation. It is suggested, for instance, that 'A caused B' may be analysed in terms of a transfer of energy, or momentum, from A to B.[12]

The suggestions on this list for the analysis of causation are neither exhaustive, nor mutually exclusive. Rather, I have included them with the intention of giving something of an overview as to the range of theoretical directions on offer when the study of causation is approached from the first perspective. Such reductive suggestions aim to shift the enquiry from one into causation or the concept of causation, towards one concerning a related phenomenon or concept, whether that be probability, change, explanation, necessity and sufficiency, necessary connection, causal laws, energy transfer or whatever, which then remains to be analysed in non-causal terms. Two serious questions are applicable to any of these proposals: firstly, whether they do, as claimed, provide definitional analyses of causation; and secondly, whether the alternative concepts in terms of which the concept of causation is to be analysed can themselves be analysed in non-causal terms, or indeed admit to any satisfactory analysis at all. That the first issue is problematic is borne out by the difficulties in making this list in the slightest bit precise: there are too many counterexamples for each of the options where instances which are intuitively regarded as causal just do not fit with the proposed re-definition of causation. Where there are no such counterexamples, on the other hand, detractors from a proposed analysis are tempted to suggest that the analysis will turn out to be trivially circular, requiring the reappearance of the concept of causation when the analysans itself is broken down. To make matters worse, there are those who argue that no satisfactory analysis of causation will be forthcoming because there *is* no satisfactory analysis; causation may turn out to be a fundamental relation which neither requires, nor admits to, further analysis or explanation. If this is the case, then the eight attempts above may draw out some of the connotations of causation, but none will serve as a definitional account of what causation is, however they are refined.[13] If the exercise might ultimately turn out to be futile, the analysis of causation is certainly not the most attractive strategy with which this account of causation could start.

In contrast to this, the investigation of causation from the second perspective, by examining the fundamental ontology involved, turns out not to present such a wide

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[12]For instance, see Fair (1979), Dowe (1995). Castañeda also gives a version of this view, although he maintains that the identity between causity (or that which 'is characteristically transferred from the causal network to the effectual network') and energy is contingent (1984, 22-3). If he can sustain this view, the relation he describes may not strictly count as reductive.

[13]See, for example, Anscombe (1971), Chakravartty (1999). Davidson also 'abjured the analysis of the causal relation', and treats 'causes' in 'c caused e' as a reporting a primitive two place relation when c and e refer to particular events, but he does not explicitly claim that there is in principle no satisfactory analysis of causation (1967a, 158).

range of options. Nor does pessimism arise about whether causation can be studied at all by this route; causal theorists are, at least, in agreement that there is an issue here to be addressed. Whatever their views on the proposed analyses of causation, most causal theorists accept that there are such entities as causes and effects and that we do predict and explain with general causal laws, confirmed by our observation of the world; the onus is on those who would deny these platitudes to provide principled reasons for their rejection. I will therefore opt to examine the causal ontology, the nature of the entities involved and the ways in which these are inter-connected.

1.2.2 The Causal Ontology

Initially, I shall be concerned with an account of the entities which constitute the causal ontology within the context of *singular* causation, where a particular entity C causes a particular entity E, if possible considered in isolation from comparison with similar cases. Discussion will follow as to how closely this notion of singular causation is tied to that of causation which obtains across generalised cases, where C-type entities cause E-type entities, as part of the examination of the subsumption of singular causal instances under causal laws.

The starting point will be to clarify which entities are causes and effects, and will take the form of a comparative study of the plausibility with which different species of entities may occupy this role. The net will be cast wide, taking as many kinds of entity into consideration as possible; an approach motivated not merely by the analytical desire to cover all possibilities exhaustively, nor merely to allow all suggestions as to the nature of causes and effects their due. It is also intended as a means by which the discussion may incorporate issues broader than that of the professed central concern as to the nature of causes and effects: unsuitable candidates may find a more comfortable and plausible position elsewhere in the account of causation, explanation and related concepts and this may be brought to light precisely because of their unsuitability to play the role of causes and effects. By discussing and evaluating accounts which take different species of entities as causes and effects, it is to be hoped that a foothold will be gained in the discussion of the ontology of causation and explanation in general and the implications of competing accounts for the analysis of other features of causation.

In the majority of theories of causation, the question as to the nature of causes and effects can be equally well framed as one enquiring which entities are the *relata* of singular causal relations. However, some philosophers deny that causation is a genuine relation, rejecting the existence of causal universals, such that when the singular causal statements 'c caused e' or 'E because C' are true, no causal *relation* obtains between the cause C and

the effect E, whichever entities they may be.[14] The truth of singular causal claims, and the appearance of a relation between individual causes and their respective effects, is regarded as being wholly dependent upon something else; for instance, on some views, these 'somethings' are nomic connections, whichever relations 'in the world' (so to speak) make laws or lawlike generalisations true.[15]

However, an additional argument would be required to reach this conclusion, which might only be convincing given some specific choice of entities as causes and effects. Some of the motivation for adopting this view, therefore, may partially depend upon the outcome of the matter presently under discussion. Due to this, I will temporarily overlook the differences of opinion here and treat the two questions – of the nature of causes and effects and what the relata of causal relations are – as if they are equivalent. Those who would prefer to deny the existence of singular causal relations are at liberty to take me as referring to 'apparent relations', for the moment at least: the presumptuousness of speaking of causal relations need not preclude the possibility that causation may not turn out to be a relation at all.

This question of which entities are causes and effects is of interest because ordinary language is liberal as to which grammatical forms may legitimately occupy the relata positions in sentences which report a singular sequence of cause and effect, making it far from clear whether these phrases pick out one category of entities or not. For example, we speak as if causation may relate things, 'The knife caused the wound', or 'The bomb caused the rubble'. Or events: 'The explosion of the bomb caused the collapse of the building'. Or, tropes, individual properties, or aspects of events or things: 'The force of the explosion caused the extent of the structural damage' or 'The sharpness of the knife caused depth of the wound', respectively. Or, perhaps the report of this instance of causation links facts or sentences, 'The building collapsed because the bomb exploded', sentences which are made true by the existence or non-existence of some state of affairs, or configuration of entities, in the world.

Potentially, all these entities and perhaps more are causes and effects. The motivation behind giving a unified account, where one category of entities plays the primary role as singular causal relata, arises from the worry that, if the nature of causes and effects remains unanalysed, the truth of singular causal statements relating events, facts, states of

[14]See Achinstein (1979, 369-86; 1983, ch. 6), also Mellor (1993; 1995, ch. 13, especially 163) who both maintain that singular causation is not a relation but for different reasons.

[15]Specifically, this viewpoint is to be found in Mellor (1993; 1995, 163). Causes and effects are facts for Mellor and he cites two circumstances in which 'E because C' is true where no causal relation obtains between facta, the entities denoted by the 'C' and 'E'. This, he claims, may either be because one or both of the facts 'C' or 'E' are not made true by facta, or because the facta which do make 'C' and 'E' true are not always related as cause to effect. Strictly speaking, therefore, the facts C and E cannot correctly be spoken of as the relata of the causal relation.

affairs, individual properties and so on, could point to *distinct* causal relations holding between each of these categories. In this case, the word 'caused' would be multiply ambiguous according to which category of entities it relates, meaning one thing when it relates events, another when it relates facts and so on. Furthermore, the situation could be even more complicated, since some causal claims *mix* the entities which they relate – 'The collapse of the building was because the bomb exploded suddenly', for example – so there could conceivably be yet more varieties of causal relations holding in these mixed cases.

Of course, ontological plurality of causal relata does not *entail* ambiguity in the meaning of the word 'caused' – it would still be quite coherent to maintain that the *same* relation holds between all these different kinds of entity alike – but it seems preferable to provide an account of causation which gives a clear characterisation of the entities c and e we are talking about when we assert that 'c caused e'. It appears to be simply an accident of the surface grammar in a singular causal statement 'c caused e' which entities are referred to by 'c' and 'e', and thus which entities are causally related. If the statements that 'The explosion caused the collapse of the building' and 'The building collapsed because there was an explosion' relate *different* kinds of entities, the former relates events and the latter states of affairs (say), thereby making different assertions about the causal relation with different ontological force, then a principled account is required of why this is the case.

The pressure to provide a unified account of which category of entities plays the role of causal relata, out of the variety which appear to be referred to by ordinary language, is quite different from another case of linguistic variety, which will not be my immediate concern and which stems from the large number of ways in which we may refer to singular causal *relations*. Aside from the obvious English examples, 'c caused e' and 'E because C' (which relate singular terms and sentences respectively), a host of other English locutions apparently relate entities in ways suggestive of causation, including the likes of 'c produced e', 'c brought about e', 'c determined e', 'c necessitated e' and perhaps also 'c affected e' and 'c influenced e'. Not all these locutions are exclusively causal, however, since 'because' appears as a general reason- or explanation-giving connective in a vast array of circumstances: from functional or teleological explanation, 'Baby zebras have stripes because they will act as camouflage from predators', for example; to stating mathematical proofs or definitions 'This prime number is odd because it is greater than two'. The answer to *any why*-question appears to be susceptible to including 'because' and, as such, this connective has an all-purpose, rather than exclusively causal usage. Similarly, 'A produced B', 'A brought about B', 'A influenced B' and 'A affected B' have connotations which are not exclusively causal, where their usage may imply some causation although not between the entities referred to by 'A' and 'B'.

Although it would be desirable to find criteria to distinguish between the causal and the non-causal usage of these terms, especially in the case of 'because', and to elucidate the relationship between A causing and A affecting B (say), the analysis of such relations has already been set aside for a future discussion. Furthermore, there is a disanalogy here between the two cases of linguistic variety: in the case of apparent variety of causal relata, it appears to be grammatical accident that different singular causal claims relate distinct kinds of entities; whereas, as should be clear from the previous section, the relationship between 'causing' and 'bringing about' or 'affecting' (say) may also be of some semantic and conceptual complexity. This disanalogy leaves space for stipulation, so for the sake of simplicity I will concentrate on cases of causal language which actually include the word (or the morpheme) 'cause', taking the paradigm cases of singular causal claims to be 'c caused e' and 'E because C'.[16] The former, following Mellor, could also be stated tenselessly as 'c causes e' (as long as this is not then accidentally conflated with the general causal claim that 'c-types cause e-types'), since we are concerned here with singular causation at all times, not only that which has already happened.[17] The acceptability of this equivalence depends on your view of time, but I will leave this question open, since the nature of time and the temporal implications of causation – such difficulties as whether 'c caused e' entails that 'c precedes e' – will not be a major concern.

Another potential source of confusion which must be removed as a preliminary to discussing the nature of causal relata arises from ambiguities in philosophical terminology, which bring with them a danger of equivocation. The usage of the terms, which pick out the entities proposed as candidates for causal relata, is often in conflict: terms such as 'event' and 'fact' have become gloriously ambiguous, with different philosophers using the same term to refer to different species of entity. An event according to Davidson's conception of events is a concrete particular which is causally or spatio-temporally individuated, whereas Kim characterises an event as a thing having a property at a time, and these entities play correspondingly distinct roles in any account

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[16]An aside on etymology and morphology: The ease of this stipulation is a luxury of English, in other languages (Slavonic Languages, French, Italian, Romani and Finnish, to name a few) it does not work so well, if at all. Some languages, such as Russian, already distinguish between a 'because' which cites *that* something was a cause and a 'because' which explains *how* or *in virtue of what* something was a cause, as well as distinguishing these cases of 'because' from those which give functional explanations in terms of ends, goals or future states. (There is also a corresponding variety of ways of asking 'why?' in order to deal with this.) Additionally, these versions of 'because' in Russian bear no morphological relationship to the verb 'to cause'. These linguistic variations suggest that ordinary language philosophers would be on extremely perilous ground in the study of causation and that drawing philosophical conclusions about causation from the morphological structure of English alone is more ill-advised than usual. The linguistic differences may be worthy of further survey, akin to that conducted by Kathy Wilkes on 'Consciousness' (1988), although I think this is unlikely to yield an conclusion parallel to that of Wilkes, that the study of causation is not intelligible as a unified area of study at all. Following Anscombe's suggestions that 'cause' is a general term which exists, or can be easily introduced, into any language which contains more specific causal concepts – burn, push, carry, scrape, squash and so on – and/or many substantives or natural kind terms (1971, 93), I think we may assume that this will include all natural languages.

[17]1991, 205.

of causation.[18] Davidsonian events are as ontologically fundamental as objects or things, in contrast to Kim's events which are derivative entities, constituted by the other, ontologically more fundamental entities: things, properties and times. This latter conception permits such events taken individually to make sentences true – those sentences which ascribe a property to an individual at a time – thus, Kim's events are not particulars, since making whole sentences true is precisely what particulars *cannot* do. Rather, due to this structural complexity, Kim's events appear to have much more in common with states of affairs, or 'facts' on Mellor's loose conception of facts, than they do with Davidsonian events. For brevity and to disambiguate these two very different kinds of entity from the start, therefore, I will distinguish Kim's events as 'K-events' and reserve 'event' for the Davidsonian variety, using the less elegant 'D-event' for these entities where there is a danger of confusion.

Similarly, the term 'fact' suffers from inconstant usage, from Mellor's 'Facts...make whole sentences, statements, thoughts or propositions true',[19] where the truthmakers of sentences are construed as occurrent features of the world such as states of affairs or real situations, to an alternative analysis of facts as a subclass of 'abstract situations', which may be characterised as ordered triples $\langle F_n, x_n, t \rangle$[20]. Although these conceptions both construe facts as the extra-linguistic correlates of true statements, they are dissimilar in other ways. The latter are abstract, set-theoretic entities which are neither occurrent features of the world – they have no determinate spatio-temporal location – nor are they dependent for their existence on physical objects. As such, they are unlikely candidates for the relata of singular causation, since all (I think) intuitive conceptions of causes and effects would explicitly *deny* that causes and effects are unlocated entities. Thus, an account of singular causal relata employing facts requires the conception of facts employed to be clarified, in order to ensure that the entities playing the role of cause and effect do not exhibit such intuitively incompatible features.[21] I will rule out the set-theoretic conception of facts, therefore, ahead of the following discussion of causal relata.

I shall postpone further discussion of the ontological differences which are concealed by common terminology until each of the various candidates for the role of causal relata are considered, and turn now to the question of how this is to be done. The possible candidates for this role mentioned so far include entities as diverse as D-events, objects, facts, states of affairs, K-events, property-instances, event aspects, tropes and modes.

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[18]Davidson (1980, passim); Kim (1973, passim).

[19]1991, 202.

[20]Where F_n is an n-adic relation, x_n is an n-tuple of objects and t is a period of time. See Taylor (1985, ch. 2), Martin (1967), Menzies (1989, 70). This entails that all facts are to be identified with ordered triples, but not all ordered triples are facts since an ordered triple exists whenever the constituent entities of the triple exist. I am not concerned here with evaluating this conception of facts, however; I merely wish to rule out these abstract entities as suitable causal relata.

[21]This point is also made by Menzies (1989, 71).

However, this diversity can be tamed somewhat since one important feature of the candidates has already become manifest in the context of the terminological discussion, namely that they may be distinguished as either complex or simple entities. On the one hand, causes and effects may be entities such as K-events, states of affairs or facts, on a conception of facts which is compatible with them having spatio-temporal location; entities which are *essentially* structured complexes of other entities such as events, properties or things. They are derivative entities, constituted by more fundamental components standing in a certain structure to each other. On the other hand, there are simple entities or particulars, a class which further subdivides into *'abstract'* and *concrete* particulars. Here 'particular' is meant in the sense that because such entities are simple they are unable to make sentences true, rather than the sense of 'particular' as it is used to classify unrepeatable entities in contrast to universals or repeatable entities.[22] Although this latter usage would include particulars in the former sense as a subset, as they too are unrepeatables, it does not exclusively capture the category of entities I want, since the conception of particulars as unrepeatable would also include individual instances of structured complexes, entities such as K-events and states of affairs.[23] Concrete particulars, including D-events and objects, are entities which are logically capable of independent existence, their existence is not dependent upon that of any other members of that category. Also, on condition that they may be individuated without recourse to any constituent parts they may have, it remains an open question whether a particular D-event or object has an internal structure or consists of any component parts at all. The class of abstract particulars includes the remaining candidates for the role of causal relata – property-instances, individual properties, tropes, event aspects and modes – which are 'abstract' *not* because unlocated, but because they are dependent for their existence on their occurrence in a bundle of properties or tropes, say, a bundle which would constitute a concrete particular.[24]

This division of the candidates into structured complexes on the one hand, and concrete and abstract particulars on the other, serves more than to just narrow down the cases to be considered in an *ad hoc* way. As will become apparent, discussions about the suitability of these entities as causal relata do not address the suitability of the individual candidates – K-events, say – but apply more generally to the entities as they fall into these three groups. It is the difference between these three groups of candidates, and not the

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[22]Armstrong (1978) contrasts particulars with universals in this latter sense.

[23]Structured complexes *can* be treated as particulars in the sense I am using the term, but this requires treating them as simple entities (see, for example, Bacon (1995)). Characterised in this way, they are members of the category of abstract particulars (see 2.1).

[24]This distinction of concrete and abstract particulars according to the possibility of their existing independently is not entirely uncontroversial, since some trope theorists have suggested that tropes are capable of independent existence, even if dissociated tropes never actually exist. I will not pursue this issue, since nothing turns upon it in the following discussion. See Williams (1953) and Campbell (1981, 127 - 128).

distinctions between the individual categories of entities themselves, that affects their coherence in a theory of causation. Therefore, nothing will be lost by considering a whole group of entities together, a technique which has the added advantage that the choice as to the general suitability of the individual candidates as entities to be employed in metaphysical theorising is not purely to be made on grounds of their suitability as causes and effects. Should it turn out, for example, that there are distinct species of structured complexes and that this group of entities are the only suitable candidates for causal relata, then the reader is at liberty to choose which category of structured complexes – facts, K-events, states of affairs, real situations and so on – she finds most plausible on other grounds.

1.3 Desiderata of a Theory of Causation

Having begun this chapter by examining the perspectives from which the study of causation can be approached, I shall finish by considering some of the pre-theoretical intuitions which we hold about causation, according to which a putative account of causation can be assessed to some extent, and from which it ought not to stray too greatly, if it is to be recognisable as an account of causation at all. Such intuitions are, at best, rather vague and ill-formed, representing an assorted collection of the general features of causation distilled from a lifetime of experience of the phenomenon embodied in innumerable common-or-garden causal instances: bricks breaking windows, unsupported objects falling towards earth, hurricanes devastating cities, stars forming, volcanoes erupting, thoughts causing actions, computers losing data, plants growing, food cooking, lifestyle and environmental factors causing disease, ethnic tension causing wars, negotiations averting wars, and so the list could go on. This being an intuitive survey, however, whichever features are taken pre-theoretically as attaching commonly to everyday cases of causation may well turn out to be inconsistent with each other, and yet more may be incompatible with the ensuing theoretical discussion. As Honderich remarks, the 'question of 'What do our beliefs about causation come to?', it can be supposed, has no clear and plain answer.'[25] I will not, therefore, treat consistency with any one of the following desiderata as being necessary to an acceptable account of causation, since conflict with some causal intuitions may well be unavoidable. However, should it transpire that commonly held beliefs about causation are incompatible with a proposed theory, the motivations behind including them in the first instance will have to be explained away.

The first feature of causation which seems worthy for inclusion on this list is the independence of the occurrence of causation from any sentient beings with the mental

[25] 1988, 14.

capacity to notice or to theorise about it. This, of course, excludes those cases of causation where such beings, and their thoughts, perceptual abilities and actions, are regarded as entering into the causal chain themselves, but it seems plausible to assume that the appearance of beings with such capacities was itself caused in some way and that many happenings in the world would still occur in the way that they do whether or not sentient beings such as ourselves had ever existed. This assumption does not merely make the almost truistic claim that causation is not mind-dependent, in some sense subjective or dependent on the existence of a particular mind, but also rules out weaker forms of dependence upon mental capacities when these are shared and communicated across people and societies, such as dependence on language or theory. It is desirable therefore, that within the theory of causation, the range of the entities permitted to occupy the role of causes and effects is not constrained by the boundaries of linguistic possibility, nor their existence tied to what can be said in an actual language. Similarly, it seems desirable to reject species of entities as singular causal relata, if their existence is dependent on their appearance in some actual or possible theory, unless there is some way to determine that *only* that theory is true.

Secondly, it would be desirable that the entities playing the role of singular causal relata be *occurrent* features of the world, rather than abstracta lacking spatio-temporal location. This location need not have definite, concrete boundaries – neither many macroscopic objects such as mountains, nor many entities countenanced by physics such as electromagnetic fields are exactly locatable, without this impinging on their having some presumed causal role – but there needs to be some sense in which cause and effect can at least be spatio-temporally located with respect to each other, and in relation to other entities in the world. This requirement is not so strong as to rule out entities which are dependent on abstracta for their existence, as long as the causes and effects are determinate, occurrent instances of such abstracta rather than being identical with them. Thus, it does not rule out the possibility that causes and effects are the determinate instances of repeatables, or universals, and that some kind of platonic theory of universals as transcendent, abstract forms is true.[26]

Thirdly, specificity or precision as to which entity is cause, or effect, of a particular causal sequence would be advantageous, recommending an ontology of entities as causes and effects which permits such specificity over one which does not. For instance, certain features of a concrete particular, an object or D-event (say) are intuitively more causally efficacious than others: it is the pharmaceutical properties of the paracetamol in the pills rather than their colour or shape which caused my headache to go away; or it is the force of the storm, rather than the volume of rainfall it precipitated or the height of the

[26]It would, however, rule out Plato's own thesis that the forms themselves, *qua abstracta*, enter into causal sequences (*Phaedo*, 95 - 106).

clouds, which caused the severity of the structural damage. Similarly, examples of singular causal statements where a change of emphasis from one aspect of an event to another apparently changes the truth value of the statement are cited to illustrate this. If 'Socrates *drinking hemlock* at dusk caused his death' is a true singular causal statement, it is not clear that when the emphasis is altered to make the statement 'Socrates drinking hemlock *at dusk* caused his death' that the truth value of the singular causal claim is preserved. That the D-event of Socrates' drinking was a drinking of hemlock seems to have causal relevance which the (same) D-event being a drinking at dusk lacks.[27] If this third desideratum is to be fulfilled then, it would not be events themselves, *qua* concrete particulars, which are the relata of singular causation, but their features or aspects, the abstract particular tropes or individual properties which they exemplify. Thus a more fine-grained ontology of what is contained within the spatio-temporal boundaries of a concrete particular would better serve to explicate what kinds of entities causes and effects are. I shall not, however, regard this intuition as being forceful enough to rule out accounts of causation between concrete particulars prior to further investigation.

A fourth recommendation for the acceptance of a theory of causation would be its illuminating the relationship between causation and explanation. One such intuitive relationship may be summed up by the maxim that 'causes always explain their effects', another, more philosophically sophisticated conjecture is that most, if not all, instances of singular causation are covered by some general law. The fulfilment of these expectations by a theory of causation need not result in explicit equivalencies between the relation of causation and those of explanation or nomic connection, of the kind suggested in the course of discussing possible direct analyses of the causal relation.[28] It may not be the case, for instance, that the intuition that causes explain their effects is correct simply because the former cause the latter; the relations of causation and explanation may be distinct, so long as the theory which accounts for them is rich enough to be able to provide an account of their seemingly constant inter-relationship.

The fifth desideratum of a theory of causation is that it provide a clear conception of the entities involved in the causal ontology. This can hardly be counted as a pre-theoretical intuition, however, except by those so absorbed in philosophy that they have entirely forgotten what common-sense involves, so it requires a little more justification than the other intuitive concerns. To ensure that the entities playing the role of causes and effects meet the earlier intuitive demands that causal relata be determinate and locatable, and that their existence be independent from the theories about them, a certain amount of clarity is required as to the nature of the different candidates proposed. A way in which this might be achieved is via the provision of *constitutive* criteria for the identity

[27]The examples come from Achinstein (1979) and Honderich (1984).
[28]See 1.2.1.

or individuation of a species of entity, which enable a minimal specification of how the members of distinct ontological categories of entity differ. If causes and effects are determinate entities, it would seem odd if there were no criterion to determine when causes are identical, the same entity picked out in different ways, or if there were nothing that determined when causes were distinct: without a notion of when causes are the same and when different in particular instances of causation, we do not seem to have captured the notion of when something is a cause at all. In addition to this, the demand for constitutive identity criteria can be motivated by the Quinean slogan 'No entity without identity', a plea to conform with a general standard of ontological parsimony, economy and general theoretical tidiness.[29] This is arguably not an issue about *identity*, however, which may be construed as a completely general relation[30], but one about narrower relations, such as 'is the same event as' or 'is the same property-instance as'; thus, having identity conditions for events, for example, helps to characterise the concept of eventhood with greater clarity.

The weight granted to the requirement for precise identity criteria is debatable, however, and so the inclination towards strictness on the matter of identity or individuation criteria may vary accordingly. The Quinean claim stems from the thesis that all and only the entities over which we existentially quantify exist and, since the existential quantifier '$\exists x$' can be cashed out as 'there is at least one x', there is a requirement to be able to ascertain when apparently distinct entities are identical in order that we may intelligibly quantify over them. This reading of the existential quantifier has been challenged, however, together with the slogan that follows it, on the grounds that the Quinean reading of the existential quantifier is overly strong; that is, there is an alternative reading which simply takes '$\exists x$' to be 'there is something x such that...' which does *not* require identity criteria to ensure intelligibility.[31] Thus, it is claimed, rigorous adherence to the Quinean maxim is not required in metaphysical theorising and there need be no general identity or individuation criteria for each category of entity – the class of objects, say – over and above the criteria available for individuating different kinds of object, such as tables, trees, protons and planets.

However, one may reply that the relaxation of this requirement overlooks some of the advantages of general identity and individuation conditions. If the criteria for individuating objects is nothing more than the collection of criteria for individuating specific *kinds* of objects – tables, trees, protons, planets and so on – then there seems to be no way to answer the question of how it is all these entities are *objects*, rather than being

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[29]1960, sections 42-3.

[30]The generality of the identity relation is such that 'one and the same relation that applies to things of kind K and to things of kind K*, no matter how utterly dissimilar such kinds may be'. See Jubien (1996) where this issue is discussed in greater depth.

[31]See Lowe (1989b).

entities of diverse ontological categories. On classification of a new kind of entity, it is usually a trivial issue whether that entity is an object, an event, a property, or whatever, but if there are no general constitutive identity criteria for each category to be had, then the basis of this triviality seems rather mysterious.[32] Also, if it turns out that co-existing categories of entities rely on the *same* criteria of identity and individuation, those of spatio-temporal location for instance, then it seems that we should be entitled to ask an additional question as to why it is that a certain entity spatio-temporally located is an object rather than an event, or an event rather than an individual property and so on. There must be something else about the respective natures of these entities which distinguishes them from each other, otherwise there seems to be no grounds to the claim that there is a genuine ontological difference between them.

Secondly, reliance on the collection of criteria by which specific *kinds* of an ontological category, kinds of objects for instance, are individuated leaves no room for a clear conception of *particulars* of that category except insofar as they are instances of kinds; there may be more to a particular entity, such as an event or object, than just that it belongs to this or that kind. The analysis of *singular* causation, singular causal sequences of a particular cause and particular effect, does not immediately call for consideration of types or kinds of entities rather than just of particular instances of the category itself, and there is no reason why particulars should be less fundamental or harder to individuate than types or kinds. Moreover, as the discussion of properties and laws will show, there is good reason to be suspicious of a taxonomy which claims to provide a determinate and exhaustive set of kinds, and still better reason for suspicion if it is maintained that this taxonomy into kinds is also the way in which the world divides itself.[33] Therefore, a metaphysical picture in which the individuation of particulars is parasitic on that of kinds, where there is a reliance on each particular essentially being the instance of a kind for which there *are* individuation conditions, seems presumptuous at best and, at worst, places a damaging constraint on the possibilities of metaphysical theorising. A realm of disparate particulars conceived of prior to, or regardless of, their belonging to kinds does not make sense in the absence of general identity and individuation conditions and, with no conception of unsorted or untaxonomised particulars, there can be no room for scepticism as to whether a taxonomy or system of classification as a whole may itself be incorrect.

General identity and individuation criteria for categories of entities are of interest to minimally capture the essence or nature of each category which it does not share with other ontological categories; they are constitutive of what it is to be a member of that

[32]I say 'usually' here since problems may arise in some cases as to which ontological category an entity belongs.
[33]See 3.6 - 3.11.

category. Not having suitable criteria need not rule out the existence of a category of entities, for this may be merely due to a lack of philosophical imagination, but it does give reason to be sceptical that theories which employ them will do so in clear and well-defined ways. Additionally, given the other desiderata of causal relata being located, determinate and fine-grained enough to fit our intuitions about causation, it seems to be particularly important in the case of the category of causes and effects that they be provided. In view of these considerations therefore, I will include a discussion of constitutive identity and individuation conditions as part of an assessment of the plausibility of the different categories of entities which are candidates for the role of singular causal relata.

Finally, as a matter of epistemological common sense, it seems advisable to require that there be some means by which we can know about the entities postulated within the proposed causal ontology. This constraint is required to defend proposed theories of causation against charges of obscurity and to conform with the intuition that we do know about causation, or about the entities which act as causes and effects. If an account of causation is plausible on a metaphysical level but the entities within it are isolated in principle from our epistemic perspective, then the confidence we have in our day-to-day judgments about causation is rendered mysterious. The alternative metaphysical accounts of causation will therefore be subjected to various sceptical arguments, to help ascertain the strength of our epistemic position with regard to the ontology they countenance.

1.4 Summary

In the course of this chapter, a methodological approach has been outlined for the study of causation and a suitable staring point determined. In addition to formulating this methodological strategy, I have also laid out six intuitive desiderata of a theory of causation to place some constraints upon what is to count as an acceptable account. It would be desirable to characterise causation as a phenomenon which occurs independently of sentient beings to think or theorise about it and that causes and effects are occurrent, spatio-temporally located features of the world. From a more theoretically oriented perspective, maximal precision is desirable as to which features of the world are causally efficacious and maximal explanatory power with regard to the relationship between singular causation and phenomena such as explanation and the apparently universal subsumption of singular causal instances under causal laws. Fifthly, it has been argued that our conception of such general ontological categories as are being considered as candidates for causal relata would be better clarified if constitutive identity and individuation criteria could be provided for the categories in question. Thus, discussion of such issues will also be included for each species of entity when their suitability as causal relata is considered. Finally, it has been suggested that our epistemic situation with

regard to entities in the metaphysical theories of causation to be considered should be as favourable as possible; there is little solace in a consistent and coherent account of the causal ontology if there is no way we can know about the entities it involves. It has been allowed that a successful theory may not meet all these constraints, but it is nevertheless desirable for most to be satisfied in order that the pre- and post-theoretical notions of causation do not diverge too greatly.

The scene has now been set to embark on the investigation of the possible categories of entities which are initially plausible as candidates for the role of causal relata.

CHAPTER TWO

COULD CAUSES AND EFFECTS BE ABSTRACT PARTICULARS?

2.1 Why start here? – The Intuitive Case in favour of Abstract Particulars.

At the close of the previous chapter, I suggested six key attributes which are intuitively desirable for a theory of causation. In light of these, abstract particulars are the most promising category of entities with which to begin the discussion of causes and effects, since they appear to fulfil at least three of these desiderata: they are spatio-temporally located entities, occurrent features of the world; they promise a high level of specificity within a qualitatively sensitive, finely-grained ontology; and the intuitively close interconnection between property-instances and the instantiation of causal laws, which appear to capture relations between general properties, offers a suggestion as to how the relationship between singular causation and causal explanation can be explicated. Moreover, if we can make sense of a strong realist conception of abstract particulars, of the world naturally taxonomised according to objective standards of similarity and difference, then these entities would also fulfil another requirement that causal relata exist as individuable entities independently of sentient beings to theorise about them. Only the issue of the identity and individuation of abstract particulars remains out of reach of an immediate intuitive grasp, and this is an issue to which much of this chapter will be devoted.

The ontological family of abstract particulars includes entities such as property-instances, particularised qualities, event-aspects, quality-bits, tropes, modes and individual properties but, for the present purpose of analysing causation, the differences between these are mainly terminological.[1] They are particular, unrepeatable occurrences of qualities or properties which will be initially considered as singular instances, isolated from any general properties or universals which they may be said to instantiate, or from any meta-relations of likeness or similarity which group individual tropes or modes into resemblance classes. The *sharpness of the knife, the weight of the fruit, the force of the storm, the pitch of the chord, the redness of the bus* and so on, are all abstract particulars; in Lowe's terminology, they are modes of objects or events, or 'ways of being'. Treated in this way as unrepeatable *particulars*, the redness of the bus, the redness of the tomato and the redness of the carpet are as unrelated to each other as they are to the sharpness of the knife or the

[1]Lowe, for instance, uses 'mode' in preference to 'trope', but stresses that the distinction is only a terminological one; similarly Honderich's 'individual properties' are also entities of the same species as tropes.

pitch of the chord; further details must be added to account for how or whether these property-instances are classified.

In addition to their intuitive plausibility, there is a second, more methodological, motivation for beginning the discussion of the metaphysics of causation with abstract particulars, since considering this category of entities before that of structured complexes makes for a more perspicuous route through the options available. If, following many supporters of an ontology of states of affairs, K-events or facts, these are construed as being *derivative* entities, constituted out of simpler components such as objects, properties and times, then it will be useful to have a clear conception of abstract particulars since they are constituents of states of affairs. Moreover, since many accounts of the identity and individuation of structured complexes rely upon the identity criteria of their constituents, these accounts will stand or fall according to how the individuation of both abstract particulars and objects fares.[2]

On the other hand, if whole facts are treated as unrepeatable particulars – as being simple entities, rather than complexes as I have previously characterised them – then consideration of such entities as causes and effects belongs with the discussion of abstract particulars. On this view, facts are construed as being trope-like: they are ontologically fundamental building blocks, unitary wholes which are unable to make sentences true, and from which the entities which appear to compose them are abstracted.[3] Only in special cases would such entities *not* count as abstract particulars, since the existence of a fact, a particular object O having a property P (say) construed as a unitary whole, would be dependent for its existence on the existence of other facts, those of the object O having other properties and other objects instantiating the property P. Only if the property P picks out *all* the features of the object O, specifying the *nature* of O, would the fact of O having P be a concrete particular, in that it could have independent existence, rather than being abstract.[4] Thus, the implications of whatever conclusion is reached about the suitability of abstract particulars as causal relata will go beyond this category of entities,

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[2]Kim (1973, 9), Menzies (1989, 69), Mellor (1995). Specific objections to structured complexes such as facts being the relata of causation will not be addressed in this thesis; in particular, I will omit discussion of the 'slingshot' argument. See Davidson (1967a) and discussions in Menzies (1989, 78 - 82), Mellor (1995, 113 - 9), Neale (1995). My evaluation of the plausibility of such entities as causal relata will be confined to consideration of the plausibility of the properties, or property-instances, which are partially constitutive of them.

[3]Armstrong (1978a, ch. 8), Bacon (1995).

[4]The reason that the fact of O having P is not automatically construed as a concrete particular – by its inclusion of the object O – is that within a state of affairs, or fact as we have been calling it, the object O cannot be construed as a particular in what Armstrong terms the 'thick' conception of a particular, as a particular including all its properties or the features which it has. (1978a, 114) Rather, such a particular must be taken as abstracted from its properties – the 'thin' conception – in order to make non-trivial sense of it having the property P, in which case O is not what I have been calling a concrete particular. If we took the thick conception, talk of O having P would be redundant, since O on the thick conception has P already.

also being relevant to the suitability of facts, whether these are construed as a species of particular or as structured complexes.

There are two main points at which the different accounts of abstract particulars diverge. Firstly, controversy surrounds how, or indeed whether, the leap from the particular to the general is made, the explication of the relationship between the unrepeatable and repeatable entities.[5] Secondly, there is little agreement about the order of ontological priority which is to be accorded to abstract particulars in relation to concrete particulars and general properties; that is, whether or not abstract particulars are to be construed as fundamental, being ontologically prior both to concrete particulars such as events and objects and to general properties or universals. However, neither of these issues will have much bearing here. When, later in the chapter, the discussion shifts from one about individual entities to one which considers these individuals as instantiating general properties, universals or kinds, it will be sufficient to accept *that* this leap can be made, without becoming involved in the details of how exactly it is to be done. If trope theorists (say) cannot provide an adequate account of qualitative recurrence or apparent sameness of kind, then it will certainly count against the tenability of their ontology, but my discussion of the plausibility of such entities as causes and effects will not stand or fall on this basis. Similarly, I shall not need to consider controversies about the direction of ontological priority between tropes on the one hand, and objects, events and properties on the other (although the conclusions drawn from the investigation into causes and effects may lend support towards a decision one way or the other).[6] The wider metaphysical picture is of interest only insofar as it impinges on the efficiency of an account of causation; there is no space to worry whether tropes, or objects and properties, are the ultimate furniture of the universe. Therefore, the reader is free to resolve these disputes for themselves in the way that they prefer, for I shall have little more to do with them from here.

2.2 The Individuation of Abstract Particulars

It is time to address the question of whether there are constitutive criteria of identity and individuation for abstract particulars, whether some feature can be found

[5]Trope theorists, who would prefer to dispense with repeatable entities, would deny that there is any relationship between the particular and general to be explicated, but are still required to account for how qualitative recurrence or apparent sameness of kind arises within their ontological schema (see 2.2).

[6]The more controversial direction for this ontological dependence is defended by those who argue that tropes, and fundamental 'meta-relations' which hold between them, are ontological primitives from which the more intuitive ontology of concrete particulars and properties (say) may be abstracted as derivative entities. Objects or events and their properties are no more than bundles or sequences of tropes, grouped together into objects on the one hand, and properties or universals on the other, by meta-relations of *concurrence* and *likeness* respectively. See Bacon (1995).

distinguishing members of this ontological category from those of other categories, as an exercise intended to help characterise the nature of such entities.[7]

Sameness of spatio-temporal location provides a necessary, but not sufficient, condition for the identity of property-instances, since indefinitely many may exist at a unique time and place.[8] Of course this is to be expected, given that the spatio-temporal distribution of general properties does not serve to individuate one general property from another: every living creature with a heart is also a creature with kidneys, yet the general properties of cordateness and renateness are distinct. The failing is more acute for property-instances however, since, unlike general properties, they are *unrepeatable* particulars and so the problem of co-location is not one reserved for special cases. The contents of my coffee mug are currently hot, black, bitter, Colombian and have a certain viscosity, density, mass and so on; these and many more property-instances are all co-located, they could be construed as non-spatiotemporal parts of the single spatio-temporal region. In addition to the quantitative, spatio-temporal criterion, a qualitative criterion is required to discern when co-located property-instances are the same or different; the qualitative nature of such entities is relevant, not merely their relative positions in space and time.

The criteria by which abstract particulars are individuated must be qualitatively sensitive, which is to say no more than that they must be sensitive to which property-instances there are at any one location. But the difficulties which this demand brings are more severe than even the obvious circularity which my formulation of it suggests. These property-instances are fundamental ontological particulars, each one is, by definition, a unique quality or feature which possesses no general, repeatable features by which it may be classified or sorted. In Armstrong's terms, these entities, *qua* particulars in abstraction from general properties or universals, are '*bare* particulars' lacking the ontological resources required for qualitative relations of similarity or difference to hold between them: property-instances are (ontologically) indistinguishable. There is nothing in common between the redness of the bus, the redness of the tomato and the redness of the carpet, for example, in virtue of which these property-instances are related to each other and which also groups them by degrees, according to the relationships between particular colours, or between exactly the same shades of colour and so on.[9]

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[7]The usual provisos apply; see 1.3.

[8]This criterion will, however, reappear in the discussion of concrete particulars (see 4.4).

[9]Armstrong also suggests that this view, which he calls 'particularism', is incoherent even when the problem of bare particulars is dealt with, since its characterisation of the *quantitative* features of tropes requires the *ad hoc* stipulation that like property-instances or tropes cannot occupy the same spatio-temporal location (1978a, 86-7). Otherwise, the coffee in my cup might instantiate three exactly resembling bitterness tropes, seven exactly resembling mass tropes and uncountably many exactly resembling heat tropes, making for a strange and extravagant ontology indeed.

There is, therefore, a more general problem with the ontology of abstract particulars at this stage in its development: not only does the trope theorist require an account of qualitative similarity and difference between tropes in order to formulate a sufficient condition for their constitutive criteria of identity and individuation, he also requires one to evade Armstrong's charge that the ontology of tropes (conceived of as bare particulars) has insufficient ontological resources to account for the Moorean fact that uncontroversially distinct individuals may nevertheless be of the same type or kind.[10] While the former issue might be evaded on the grounds that the requirement for constitutive identity criteria is an obscure philosophical concoction, peculiar to a distinctive philosophical position,[11] the latter demand to accommodate the Moorean fact of apparent sameness of type is one which cannot be dismissed in any account of fundamental ontology. It is, as Armstrong puts it, 'a compulsory question on the examination paper', since failure to answer it would mark the irrevocable divergence of philosophy from the path of common-sense.[12]

Trope theorists, being well aware of this potential obstacle to their account, supplement their fundamental ontology accordingly: tropes are 'bundled' in virtue of fundamental similarity meta-relations[13] of *concurrence* and *likeness*. Different trope theorists vary slightly in the account they give of these meta-relations in order that the theory accords with our ordinary ways of speaking about likeness admitting of degrees, but the details are not pertinent here. In a rough, circular formulation of these meta-relations, tropes *concur* when they both involve the same concrete particular, and *like* tropes involve the same property or relation. Tropes are thereby grouped together into 'bundles' and resemblance classes in virtue of the meta-relations of concurrence and likeness respectively, the limiting case of the latter being *exact* resemblance or likeness, an equivalence relation. Each equivalence class created by exact resemblance may, in Williams' words, 'be supposed to be, or at least to correspond formally to, the abstract universal... which it may be said to exemplify'.[14] The problem of tropes being bare particulars is thereby resolved as even Armstrong, the long-time champion of universals, admits: 'The friends of the tropes can say to the friends of the universals: 'Anything you can do, I can do better, or at least equally well."[15]

The worry for the friend of tropes, however, is that in admitting the meta-relations as ontologically fundamental, he has left no scope for any further explication of *why* an

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[10]Moore (1959), of which much is made by Armstrong (1978a; 1978b).
[11]See 1.3.
[12]1978a, 17.
[13]So called by Bacon (1995) since tropes themselves are characterised as *particularised relations* and *'meta-*relations' relate these. 'Likeness' is also called 'resemblance' (Campbell, (1990)), or 'exact similarity' (Williams (1953, 80)).
[14]1953, 80.
[15]1992, 170.

incidence of exact resemblance obtains. While we may explain the resemblance of two *concrete* particulars by saying that they exemplify the same property or contain exactly similar tropes, for instance, there is no possible further fact which can account for exact likeness between tropes. When two particular instances of redness exactly resemble each other, there is nothing more to be said in explanation of this fact; we cannot ask why, or in virtue of what, the exact resemblance obtains. The suspicion that trope theory is forced to treat this issue as brute fact, when it might otherwise admit to further explanation, is voiced by Campbell while developing his own version of trope theory: 'explanations must stop somewhere. But is this a satisfactory place to stop?'[16]

Despite this worry, Campbell is content enough not to postulate any additional entities which may alleviate this non-explanatory situation.[17] However, it leads many to expand their ontology to include general properties or universals, to supply a means of explaining why abstract particulars fall into the resemblance classes they do. On these ontological variants, a property-instance is literally just that: it instantiates a general property or kind. Or, following Armstrong, an abstract particular may be construed as instantiating a universal, a repeatable entity wholly present with each instantiation. Again, the nature of the relationship between the particular and the general is a substantial area of debate, which I will be forced to give no more than a cursory glance. The main issue hinges upon whether the range of property-instances which exist, or the relations of likeness holding between tropes, is due to the existence of repeatable entities, such as universals or general properties, or their membership of a resemblance class, or even their correspondence to independently existing universals or Platonic forms.[18] (The latter suggestion is not one I would be inclined to recommend on the grounds of the ontological mysteriousness of the entities, the Platonic forms, which are postulated, but the alternative suggestions are less easy to dismiss.) However, the details of these accounts are not important to this discussion, so I will simplify the relation between property-instances and general properties or universals at this point to talk of simple instantiation; that is, an individual property-instance of redness is the instantiation of a general property or universal redness.[19]

The additions to the ontology of bare abstract particulars, made in order to account for qualitative similarity and difference between them, appear to improve the chances of finding constitutive criteria for their identity and individuation. On the basis of each abstract particular being an instantiation of some general property (say), the individuation of co-located property-instances can be grounded in which general

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[16]1981, 135.

[17]It turns out that he and other trope theorists are none the worse for maintaining this position (see 2.8).

[18]See Armstrong (1978a) for the origin of much of the modern debate on this issue.

[19]If instantiation is taken to be a relation, then the instantiation account is regressive, but it won't harm to talk of instantiation in this way.

properties they instantiate. However, this does not provide immediate relief from the problem at hand; rather, the issue of what constitutes an individual abstract particular has been transposed into a question of which general properties, universals or resemblance classes there are. Moreover, at this point, it is far from clear how these general properties are themselves individuated: if this, in the end, is in virtue of something about the particulars which instantiate them, then the observations about the relationship between abstract particulars and general properties may all have been in vain. If this is the case, then the supporter of abstract particulars as the relata of singular causation may be forced to follow the lead of some trope theorists and accept that certain similarity and difference relations between abstract particulars hold as a matter of brute fact.[20]

2.3 Conceptions of Properties: Sparse and Abundant

Before investigating whether this conclusion can be avoided, however, another issue requires clarification, which may also help to narrow down the scope of the search for a constitutive criterion of property identity. Since properties are invoked in order to serve in the explanation of a variety of philosophical issues, including the philosophy of language and maths, in addition to their putative role of providing the basic ingredients of the causal ontology, the explanatory motivations which underlie their postulation inevitably affects what sort of entities these are and how densely populated the realm of properties is taken to be.[21] As Lewis explains:

> To deserve the name of 'property' is to be suited to play the right theoretical role; or better, to be one of a class of entities which together are suited to play the right role collectively. But it is wrong to speak of *the* role associated with the word 'property', as if it were fully and uncontroversially settled. The conception is in considerable disarray... The question worth asking is: which entities, if any, among those we should believe in, can occupy which versions of the property role?[22]

As a result, there are several competing conceptions of properties on the market, lying along a spectrum which ranges from the 'sparse', or minimalist, conception to the 'abundant', or maximalist, conception.[23] A typical view at the latter end of the spectrum maintains a principle of plenitude with respect to properties, such that *any property which could exist does exist.* Properties on this conception are necessary entities, their existence being governed by what is possible, and, in conjunction with a relaxed and unrestricted view about what is possible (which is by no means mandatory for those who maintain the principle of plenitude), the realm of abundant properties is extremely dense and fine-

[20]Bacon (1995), Williams (1953).
[21]See Swoyer (1996).
[22]Lewis (1986d, 176).
[23]Lewis (1986d, 178), Swoyer (1996).

grained; there is a property for every (non-contradictory) predicate, no matter how complex, and many more besides. In contrast to this, the population of sparse properties is limited, usually restricted to those properties which are instantiated in the actual world, and so it is contingent which sparse properties there are. 'Sparse' is a comparative term here, however, since the number of sparse properties may still be infinite or uncountably infinite.[24] Also, as Swoyer notes, there are other ways in which the sparse property ontology can be restricted still further, via the reduction of some property or families of properties to others.[25] However, the elimination of properties by this method is not a philosophically neutral procedure, since the nature of reduction is partially dependent upon what sort of entities properties are. I shall leave discussion of this option, therefore, until later chapters.[26]

For the purposes of attempting to provide an account of the causal ontology, it seems evident that the most suitable conception of properties lies somewhere at the sparse end of the spectrum. A fairly abundant conception, which presumes properties to serve as the semantic values for all predicates for instance (which is by no means as abundant as the 'every property which could exist does exist' view of properties as necessary entities), immediately falls foul of some of our intuitions about the redescribability of the entities which are causes and effects, and the prevalence (or lack thereof) of the overdetermination of effects by their causes. The ontology of abstract particulars is an attractive first choice as the causal ontology because it is fine-grained, but it must not be too fine-grained, and most proponents of abstract particulars, including those who rely on them as partially constitutive of structured complexes are aware of this danger. Kim, for instance, discusses this difficulty in relation to his own theory, since the structured complex K-event which is Brutus killing Caesar would be distinct from Brutus stabbing Caesar, Brutus assassinating Caesar and so on; and, not only is this true in the particular causal instance of Caesar's death, but it is true in general that 'no stabbings are killings and no killings assassinations'[27], nor is a killing with a knife identical to a killing even if these are performed by the same individual at the same time. The ontology, as it stands, is so extremely fine-grained that it appears that redescription of any cause is out of the question, since it would shift the reference to a different entity, and this seems absurd: if my finishing the previous sentence (at time t) caused me to do something, then surely my typing 't', 'i', 'm','e', '.' (at t) caused me to do that very same something, there do not appear to be two causes here but one, it seems irrelevant to the truth of the singular causal claim that the cause has been redescribed.

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[24]This will be true, for instance, if every value of a magnitude such as length or mass is a determinate property. The members of the class of distinct length magnitudes will be correlated one-to-one with the real numbers, so even if only lengths of finite magnitude exist, there will be uncountably many of them.

[25]1997, 245.

[26]See 3.13, 5.15.

[27]Kim (1993, 43) considering an objections from Davidson (1980, 129-137).

Moreover, although our intuitions about the rarity of causal overdetermination may be rather hazy, it does not seem wise to opt for a causal ontology in which it is generally the case that two or more distinct, but co-located, abstract particulars count as the causes of an effect. Not only does the occurrence of wide-spread causal overdetermination seem unlikely – the man who dies by being shot, stabbed and struck by lightning is generally considered to be the exception, rather than the rule – but co-located causal overdetermination would also overburden or endanger scientific method, since there would be no reason to halt the search for the causes of an effect in a certain place, even when one seemingly sufficient candidate had been isolated there. Thus, the abundance generated by reifying a property as the semantic value of every predicate does not appear to provide the kind of ontological schema that the causal theorist wants for two reasons: firstly because, on this conception, causes threaten to proliferate indefinitely even for what we would intuitively perceive as one, singular instance of causation; and secondly, because these properties are identical with semantic values of predicates by definition, the intuition that, to some extent, the cause and effect are redescribable in the context of a singular causal claim, without this redescription affecting truth value, would have to be rejected.

The proliferation problem described above for the semantic account of property identity is analogous to a difficulty, encountered when properties are identified with the sets or classes of their instances in this and other possible worlds[28], which Armstrong dubs 'the promiscuity problem'. Like predicates, 'sets abound and only a very few of them are of the slightest interest'[29]; sets simply do not provide the sparse ontology of properties that the causal theorist is after. Intuitions are strong that membership of the set of *beautiful green things*, or the set of *domesticated animals owned by the mothers of Shi'ite imams*, or of *hollow objects with a mass of over thirty-four kilograms situated within a twenty-four mile radius of a burning barn*, do not confer any causal power upon an entity. Moreover, the range of possible sets contains examples which seem far more obscure and gerrymandered than these. Even examples such as the set of all grue[30] things, or the set of all gricular[31] things are relatively staid, for these are sets for which we still have a comprehensible, even if gerrymandered, predicate. If, however, the property theorist maintains that *every* set is identical to a property, then set theory breeds a super-abundant ontology which far outruns the capacity of our language to generate predicates to describe it.[32]

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[28]See Lewis (for instance): (1986d, 173). I am, for the sake of this discussion, simply accepting the Lewisian modal realist formulation without argument.

[29]Armstrong (1992, 161).

[30]Where 'grue' is defined to mean 'observed before time t and green, otherwise blue'. (Goodman (1954, 74). I am assuming that observations take place before t.

[31]Defined by Hirsch to mean 'green or circular' (1993, 4).

[32]Lewis suggests that if the number of things (actual and otherwise) is beth-2, then the number of properties will be in the region of beth-3. Even for those who maintain that the stock of potential

The problem for causal theory with these abundant conceptions of properties is not their abundance *per se*, but what might be called their *'egalitarianism'* with respect to which predicates pick out properties, or which sets are to be identified with them.[33] Abundant or even super-abundant conceptions of properties may find useful employment somewhere in metaphysics but, as far as causal theory goes, too many causal properties make for an awful lot of observationally indistinguishable causes and effects. Egalitarianism in causal theory would leave it unclear whether the bull charged because he saw red, or gred, or another observationally indistinguishable property altogether[34]; alternatively, the singular causal instance may have occurred in virtue of causal relations between *all* of these properties and the effect at once. What is needed here are some inegalitarian restrictions: either an alternative constitutive criterion of identity, which would provide a characterisation of sparse properties as an independent alternative to the overly abundant semantic or set-theoretic proposals above; or some additional constraint is required which orders the abundant properties into a hierarchy, aligning them according to their causal importance.

These two approaches are not mutually exclusive[35], but they align quite neatly with the other metaphysical debate about the relationship between the particular and the general which I have been studiously attempting to avoid. On the one hand, the supporter of 'ontological inegalitarianism' claims that sparse properties are ontologically different from abundant ones, although they could, if the Lewisian set-theoretic account of abundant properties is correct, be characterised as sets of actual and possible things as well. The most popular modern version of such accounts is that following Armstrong, which maintains that instances of sparse properties instantiate genuine universals, abstract[36] entities which are wholly present with each of their instances. Abundant properties, on the other hand, are merely sets; they do not instantiate genuine universals. On the other hand there are 'elitists', who maintain that sparse properties are *not* ontologically distinct from the abundant ones – they are all either identical with sets, or resemblance classes, or instantiations of universals, or whatever – but each one of these has a second-order property according to which it is ordered relative to the multitudes of other properties. One version of this view, with which I will be chiefly concerned in what follows, is that of David Lewis who calls this second-order property of properties

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predicates in a language is transfinite, beth-3 is, as Lewis puts it, 'a very big infinity indeed' and I so will permit myself the liberty of doubting that language could in principle keep up with the proliferation of sets.

[33]I am appropriating Hirsch's terminology 'egalitarianism', 'ontological inegalitarianism' and 'elitism' in the following discussion, to slightly differing ends (1993, 55-6).

[34]Where 'gred' is defined as 'observed before time t and green, otherwise red'.

[35]One can, as we will see, adopt an alternative criterion of property identity *and* be an elitist about certain properties on that characterisation (see 2.8).

[36]In the other sense of 'abstract' to that in 'abstract particular' (see 1.2.2).

'naturalness'. Naturalness admits of degree: the majority of properties on the abundant conception have a negligible degree of naturalness; sparse, or 'natural' properties have a much higher degree of naturalness (hence the name); and the sparsest ontology of properties are the *'perfectly natural'* ones, those with the highest possible degree of naturalness have an objectively special status in relation to the others.

The differences between the elitist and ontological inegalitarian views are not particularly relevant to the consideration of properties as candidates for causal relata, since their differences arise when properties are considered according to the abundant conception, rather than the sparse one. The two sides agree that the sparse ontology of properties is required to account for causation (if properties can account for causation at all) and that such sparse properties possess some attribute which distinguishes them from abundant ones, whether this is grounded in ontological differences such as being an instance of a genuine universal (say), or being natural to a higher degree. Lewis is prepared to accept the naturalness of properties to be primitive and unanalysable, and it transpires that other property theorists will be forced to do the same.[37] However, before moving on to discuss the implications of this view, I shall look to what appears to be the only remaining alternative, that there is some constitutive condition by which sparse properties are individuated, independently of their also being members of the abundant property population characterised in terms of sets, or semantics, or the boundaries of possibility.

2.4 Relations between Properties

The preceding discussion has drawn a blank as far as the individuation of sparse property-instances or general properties is concerned, but one class of potential individuation conditions for sparse properties remains to be investigated. Quantitative criteria alone, such as spatio-temporal location, were found to be wanting, and additional qualitative conditions for individuating co-located properties cannot be formulated in terms of their intrinsic qualitative features, since each particular entity has only one such feature by definition. Other potential characterisations of properties in terms of semantics, sets, or possibility were found to breed properties in abundance, providing a dense population of properties, for which, in the main, the causal theorist has no use. But, the possibility remains that the nature of a sparse property is determined according to the relations in which it stands to other properties, or property-instances. The conditions for property identity may be inherently relational, so the question now becomes: which relations?

[37] 2.5, 2.7, 2.8.

Achinstein discusses and rejects two potential criteria, based on the relations of explanation and of confirmation, which he shows do not suffice to distinguish when properties are identical and when distinct.[38] A third relation, which Achinstein accepts, is one already familiar in the context of this thesis: the relation of causation may serve to individuate property-instances to supplement the quantitative spatio-temporal criterion, their qualitative nature may be determined on the basis of their respective causal roles. The spatio-temporal condition would ensure the particularity, in Armstrong's non-repeatable sense, of abstract particulars and the locatedness which is required of causes and effects.[39] The latter causal role criterion would provide the supplementary qualitative component to ensure an ontological taxonomy which is more fine-grained than the contents of regions of space-time, which constitute concrete particulars. This causal criterion does seem to capture the intuitive conception of what it is to be a property-instance; namely, to be an attribute of a particular which confers upon that particular a propensity, or capacity, or power, to stand, or appear to stand, in certain causal relations with other entities. A property-instance exemplified by a particular thing plays a role in determining what that thing does (both in relation to how it behaves with respect to other parts of itself and to other entities).

However, the acceptance of this amended criterion must be carefully qualified in the context of the discussion of causation, since it cannot just be taken to mean that every *abstract* particular is individuated from the others by having a particular cause and a particular effect; that is, by entering into distinct *singular* instances of causation. This singular causal condition, if true, will be trivially true, and is also unhelpfully circular, since it will be automatically satisfied by whichever entities serve as the relata of singular instances of causation, be they concrete or abstract particulars, or complex entities. If causes and effects *are* property-instances, then we would certainly expect them to be identifiable and individuable on the basis of their singular causal role. Also, since no sense can be made of this criterion without some prior notion of causal role, or what it is to have the same causes and effects, we are stuck in an unilluminating ontological circle in which different aspects of the concept of causation are defined directly in terms of each other. Outside the investigation of the causal ontology, the circularity of this criterion need not be regarded as problematic, although it does, as Shoemaker notes, 'preclude a reductive analysis of the notion of property in terms of the notion of causality'.[40] (And also, as he might have added, nor could the reduction run in the other direction.) But it may transpire that any such reductive analysis of the causal relation is out of the question anyway, so this implication need not be of special concern. A

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[38]1974.

[39]On the proviso that like property-instances may not be exemplified by the same individual, or that qualitatively similar tropes may not be co-located; that is, tropes may not simultaneously be related by the meta-relations of concurrence *and* likeness (see 2.2 and Bacon (1995)).

[40]1980, 243.

criterion based on singular causal role may serve to individuate property-instances as entities which play some *other* role in our ontology but, insofar as it is a criterion for the individuation of singular causal relata, the proposal for the individuation of such entities on the basis of singular causal role has taken us no further.[41]

2.5 Sparse Properties and Nomic Connections

Perhaps this judgement is too swift, however, for there is room for a more sophisticated account of individuation on the basis of causal role, which arises as a corollary of the requirement that any ontology of abstract particulars be able to account for the Moorean fact of apparent sameness of type, discussed earlier in this chapter.[42] The suggestion that sparse abstract particulars are identified on the basis of their respective causes and effects is unsatisfactory and so the individuation of each property-instance on the basis of the *singular* causal relations which they enter into is out of the question. However, given the essentially close connection between property-instances and the general properties they instantiate[43] (required to alleviate the danger of the ontology of abstract particulars being one of bare particulars), it seems reasonable to assume that, if abstract particulars are the relata of singular causal relations, then singular causal relations might bear the same kind of relationship to generalised lawlike or nomic connections, relations holding between general properties. To put the point more succinctly: a singular causal relation may be simply be the instantiation of a nomic connection or general causal law.

On a terminological note, I will now reserve the term 'law' to mean a *statement* of a law or regularity (which may or may not amount to the same thing), a claim concerning causation between *kinds* of entities, general properties or universals, usually expressed in terms of a universal generalisation. Confirmation of lawlike hypotheses is provided by their instances and their truth supports counterfactual claims.[44] Depending upon the analysis of counterfactuals and upon the availability of other criteria by which to distinguish lawlike from non-lawlike or accidental generalisations, these lawlike universal generalisations may be regarded as being stronger than non-lawlike ones, in being governed by a form of necessity (in some way yet to be elucidated). By 'nomic connections', in this context, I mean whatever in the world makes laws true. Depending again on the analysis of the strength of laws and the nature and ontological status of

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[41]In fairness to Shoemaker, I think his own account of property individuation (1980, 228-254) presupposes the nomologicality of causation which makes it more akin to the account of properties in terms of what I distinguish as 'nomic role' rather than singular causal instances. The same most probably also applies to Achinstein's causal criterion (1974).

[42]See 2.2.

[43]Or some similar account which invokes universals or resemblance classes of tropes instead.

[44]I shall leave open the question whether strict lawlikeness requires that laws be exceptionless.

their relata, the analysis of nomic connections themselves may be required to capture the necessitation with which certain entities, or kinds of entities, enter into relations with others.

It seems plausible to suggest that the causal role of abstract particulars is determined by the role they play, *qua* instances of general properties or universals, in instantiating nomic connections, or by their involvement in whatever in the world makes laws or lawlike generalisations true. If these nomic connections can be elucidated without recourse to a prior notion of causal role and whichever entities are causes and effects, then the difficulties surrounding the individuation of abstract particulars will have been dissipated. Nomic connections determine which sparse properties, and thus which particular causes and effects there are. Then there will be no obvious obstruction to regarding some species of abstract particular (according to your ontological taste) as the relata of singular causation.

Like the previous suggestion that abstract particulars are individuated by their role in singular causal relations, the proposal that sparse properties are individuated on the basis of their nomic role creates an ontological circle. However, unlike the former criterion which amounted to saying no more than the entities which play the role of particular causes and effects can be identified on the basis of their having the same particular causes and effects, the nomic role criterion for the identity and individuation of properties is not trivially circular. Rather than each abstract particular being related to just one particular cause and one particular effect, each sparse property is nomically connected with a variety of other properties in virtue of which its instances stand in causal relations to each other. The property of mass, for instance, consists in bearing certain relations to other sparse properties including density, volume, the capacity to be accelerated under certain applied forces, energy, certain properties of light and so on; each other these properties are nomically connected with still more properties. The picture is a holistic one of interdefined properties and nomic connections; a specific property inherits its constitutive nature from its place in this network of nomically connected properties, and its instances cause in the way that they do in virtue of the nomic connections it bears to the other property-instances with which it is instantiated.

2.6 The Nomological Model of Causation

The seemingly unavoidable shift from talk of abstract particulars as bare particulars to talk of abstract particulars as essentially being instances of general properties which figure in nomic connections affects the direction which the analysis of causation can take. In a recent proposal in support of this causal ontology, Chakravartty explains that causation between property-instances, 'ultimately, is a relation determined by capacities conferred by

properties on objects to behave in certain ways.'[45] Only if particular causes and effects can be characterised as unrepeatable entities, existing independently of their instantiating universals or general properties, would a truly *singularist* theory of causation be a possibility, and singular causal relations be analysable in isolation from consideration of universal regularities or laws. On this analysis of properties and of causes and effects, there is no longer an interesting notion of singular causation which is separable from that of causation in the general case: every case of singular causation holding between abstract particulars occurs in virtue of it being an instantiation of some general causal or nomic connection.

I will call the collection of views which maintain this close connection between singular causal instances and nomic connections '*the nomological model*' of causation, for within it every singular causal instance is either identical to, or an instance of, a nomic connection. It accords with what Mill described as the 'Law of Causation', the 'pillar of inductive science' that the same kinds of causes produce the same kinds of effects.[46] Many accounts of causation *begin* by asserting or assuming this view, although it has been justified here as a consequence of what appears to be the only way to give a plausible account of abstract particulars as causes and effects.[47] If the nomological model is ultimately found to be acceptable, then intuitions that an effect could be caused without being necessitated, or that causation could occur *without* being an instance of nomic connection, or that causation would still occur in an anomic world, would all have to be ignored. Sense can still be made, on this view, of a singular instance of causation as a relation between a particular cause and its particular effect, but these singular instances of causes and effects cannot be considered in isolation from the general case.[48]

On the other hand, the exclusion of the singularist option may be highlighted as an advantage of the nomological view by its supporters: the dependence of singular sequences of causation upon nomic connections promises an easy explication of the relationship between causation and related phenomena, such as causal explanation or prediction, through generalisation in terms of causal laws. Each case of singular causation

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[45]1999.

[46]1879, Bk III, Ch. 5, section 2.

[47]Some explicit proponents of nomological causation were mentioned in 1.2.1; however, its detractors often regard this as the received view about causation and emphasise its widespread support. See Russell (1912) and Anscombe (1971).

[48]There is still an uninteresting conception of singular causation to be had on the nomological model: property-instance F causing property-instance G may be unique in the sense that the property F was only ever actually instantiated once. However, the existence of such instances of causation which are *actually* unique does not pose any threat to the nomological model of causation. It is contingent that F occurred once, but the nomological model of causation still entails that there *is* a nomic connection between properties F and G which supports the truth of counterfactual claims: had F been instantiated again, it would have caused an instance of G. There would, of course be epistemic difficulties with formulating and confirming the law which covered this one-off instance of causation but that does not impinge on the existence of the nomic connection between F and G.

is covered by a general law because its relata instantiate the species of entities which figure in laws, universals or natural properties, and so no further account is required on the nomological model of how regularities between causal instances in nature occur.

Moreover, from an epistemological perspective, the task of our actually determining which natural kinds, properties or universals on the basis of their constitutive nomic role also appears hopeful. This is no *a priori* task if, against versions of Platonic realism about universals, it is denied that universals have independent existence as determinables over and above their determinate instantiations, or their occurrence as individual properties.[49] However, laws of nature may be discovered *a posteriori* and thus, which natural properties exist in the world is also determinable *a posteriori* on the basis of their roles in nomic connections; a complete set of laws would correspond with the set of nomic connections which determine the complete set of natural, causally relevant properties.

Of course, there are far too many cases of laws which were formerly taken to be true having been refuted or amended for us to be assured of the truth of our current science. The falsehood of the laws in such cases implies that we have simply been wrong about the existence of certain nomic connections and thus the nomic roles of the properties which figure within those laws are *not* the ones we want to individuate types of natural properties or genuine universals. However, it may be argued that the same is not true of the laws of some hypothetical, completed science: that would surely give us all the laws required to explain or predict all broadly 'physical' or spatio-temporal phenomena as well as any phenomena in causal or nomic connection with physical phenomena. Then, there would be no more room for refutation and we could be sure that each law of the complete set corresponded to some nomic connection in the world; so unpleasant discoveries, such as the nomic connections which we took to exist as the truthmakers of a law *not* existing because the law is false, would cease. Thus, in a complete science, natural properties may be discovered *a posteriori*, and ultimately lawlike and non-lawlike hypotheses distinguished.

There are infamous problems associated with the idealised conception of a complete science upon which this account of our epistemic perspective upon properties and nomic connections is based, but I will let this point go by.[50] I shall have more to say about the

[49]This account of universals is in keeping with Armstrong's claim that the existence of universals is governed by the 'principle of instantiation', a principle which is required to keep his theory of universals within the bounds of a naturalism which holds that nothing else exists except the single spatio-temporal world.

[50]For instance, Cartwright (1983; 1994) and Dupré (1993) have both criticised this conception of science. I will not dwell on their criticisms, however, since it is arguable that the nomological conception of properties under consideration can endure a certain amount of scientific disunity, such that a slightly more egalitarian, but not over-abundant conception of properties is compatible with Dupré's promiscuous

epistemological implications of this metaphysical account of causation in the next chapter, in addition to exploring some of the motivations which fuel the nomological model of causation. However, there is another metaphysical problem with the nomic account of sparse properties: as it stands, it promises a more efficient individuation of sparse properties than it delivers.

2.7 The Resurgence of the Promiscuity Problem

The reasoning behind accepting the roles which sparse properties play in the network of nomic connections as being constitutive of their identity and individuation was to provide an independent criterion by which sparse properties are marked out from the over-crowded population of abundant properties generated when properties are considered as Lewisian sets, the semantic values of predicates and so on. If the nomic criterion works, we have reason to adopt some sort of *ontological* inegalitarianism, should we wish to, since sparse properties have a distinct role in the ontology which cannot be occupied merely in virtue of membership of intuitively arbitrary and gerrymandered sets. The criterion appears to rule out seemingly causally irrelevant abundant properties which are nevertheless clearly instantiated in the actual world, such as the set of *hollow objects with a mass of over thirty-four kilograms situated within a twenty-four mile radius of a burning barn*, or *domesticated animals owned by the mothers of Shi'ite imams*, not to mention those which outrun our predicate formulating abilities entirely.

However, the nomic role criterion is still not as restrictive about which properties count as the sparse ones as its proponents would like. According to the characterisation of laws given above, a law of nature is confirmed by its instances and supports counterfactual and subjunctive claims. Considered in isolation, a gerrymandered predicate such as Goodman's 'grue' appears to be unprojectible and thereby ineligible to appear in lawlike hypotheses: although the hypothesis that 'All emeralds are grue' will be confirmed by the same observations of emeralds as 'All emeralds are green', the former will be falsified at time t, whereas the latter will not. Only the latter hypothesis is projectible, giving us licence to predict what unobserved instances will be like.[51] On an ontological level, this suggests that grueness is not nomically related in the way that greenness is to properties associated with being types of entities such as emeralds, trees, grass, chlorophyll, traffic-lights which signal 'go' and so on and so will be ruled out by the nomic criterion of sparse property identity as an arbitrary configuration which belongs only in the abundant collection of properties.

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realism (see 3.15). Further objections to this nomic account of properties and laws and their discovery via scientific theorising will be considered in the next chapter.

[51]Goodman (1954, Ch. III).

Unfortunately, the effectiveness of the nomic role criterion at ruling out gruesome properties is illusory, since it is easy enough to invent predicates which *do* go together with 'grue' to form hypotheses which are lawlike in the requisite sense, as Davidson points out.[52] He disagrees with Goodman that predicates such as 'grue' are *inherently* unprojectible; that is, he disagrees that the use of gruesome predicates can *never* give licence to make inductive inferences, nor appear in lawlike hypotheses. For instance, with a little more definition such that 'emerire' applies to all things which are observed before t and are emeralds and otherwise are sapphires, we have the lawlike hypothesis 'All emerires are grue'. Whereas the observation of emeralds will not support any grue-laws, the observation of a range of objects which includes emerires does do so: the examination of predicates or kinds, taken in isolation from the hypotheses in which they figure, is no indication of whether those hypotheses are lawlike.

Moreover, it is worth noting that the claim being made about our observations confirming gruesome laws, which are presumably made true by gruesome properties in nomic connection with each other, does not rely upon some form of relativism, according to which there can be distinct and incompatible true descriptions of the world, or incompatible, but empirically equivalent, theories; nor does it imply it.[53] Since the lawlike hypotheses 'All emeralds are green' and 'All emerires are grue' are not incompatible with each other, they can both be true at once and could be conjoined as part of the same theory. Should there be true lawlike hypotheses of a sufficiently high level of gruesomeness that they fail to be translatable, then they can just be conjoined with the theory we have. There is still one true description of the world, however heterogeneous in its vocabulary and promiscuous in its ontological commitments.[54]

At this point it would be simply begging the question to object that there simply isn't any grueness, nor are there any emerires to observe in the world, since the point at issue is how dense the population of sparse properties is and, at the moment, any predicate picking out an abundant property which looks as if it might be nomically connected to other such properties is as eligible to feature in the realm of predicates which pick out sparse properties as any other. However, one might object that the mistake in this promiscuous picture of 'sparse' properties lies in being an egalitarian about nomically related properties in the first place, since, from the point of view of theorising about causation, this restricted version of egalitarianism is still open to objections analogous to those which applied to the more obviously abundant conceptions of properties as sets of actual and other-worldly entities, or as the semantic values of predicates.[55] The

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[52]1980, 225-7.

[53]I note this simply because many arguments similar to the one in this chapter do appear to involve some such assumption and are criticised on this basis.

[54]See Haack (1996, 307-8).

[55]See 2.3.

multiplicity of properties and nomic connections, when these are all regarded as having equal ontological status, makes for an awful lot of natural necessitation in the world according to which causal sequences happen, of which, in the main, we are completely ignorant. Surely, the interactions of nature are not governed by a many cases of necessitation at once. Furthermore, as Hirsch points out, it is difficult to see on this view how the ontology of 'sparse' properties could permit an objective distinction between continuous and discontinuous change.[56] An object shifting in colour instantaneously from green to blue is a change in relation to our familiar colour properties, but not relative to gruesome colours. If the sky is bleen at the moment, and time t is *now*, then the sky just changed instantaneously to grue, yet it has remained blue all the time. Causal properties are still too abundant, even when limited to those which play a role in the network of nomic connections.

2.8 The Natural Properties Principle

What is required here is some additional constraint upon what counts as a sparse property. This need not be an all-or-nothing constraint, independent of the nomic criterion which we already have, it would be sufficient that the overly abundant ontology of nomically individuated properties were ordered into some hierarchy. However, even allowing this, any hierarchy requires some point at which to start. The difficulty with relying upon the nomic constraint alone, it is argued, is that most of the properties it admits do not mark objective similarities in nature, they do not carve nature at its joints. Just as Plato invoked a distinction between those predicates which mark the forms, such as 'pious' or 'beautiful' and those such as 'hair' which do not, the metaphysics of properties requires some distinction between those properties which mark out objective qualitative distinctions in the world and those which do not.[57] For properties to be of any use for the causal ontology, we must become elitists about which nomically individuated properties are permitted in the sparsest ontology of properties.

To this end, Lewis invokes the distinction between natural and non-natural properties: *perfectly natural* properties are the very elite minority of which the world is ultimately composed, 'whose boundaries are marked by objective sameness and difference in nature'. However, the sparse ontology of perfectly natural properties is *extremely* sparse – 'there are only just enough of them to characterise things completely and without redundancy'[58] – and we want to countenance more properties as natural than just those which govern the behaviour of superstrings (say). For this, Lewis proposes that the *simplicity* of the relationship between a putative property and the elite perfectly natural properties is

[56] 1993, 74.
[57] *Phaedo*, 265.
[58] Lewis (1986d, 178).

important. Thus, on the basis of the elite minority of perfectly natural properties, the naturalness of other nomically individuable properties may be regarded as a matter of degree.

This elitist picture facilitates the hierarchical ordering of properties we have been looking for, organising properties in a way which appears to roughly coincide with our intuitive rating of the importance of properties to the causal order. On this view, the lawlike properties of my examples – green and grue – are neither of them perfectly natural, but it can be presumed that green is natural to a greater degree than grue, being more simply derived, definitionally or otherwise, from the elite, perfectly natural minority. Unlike naturalness, perfect naturalness does not admit of degrees: a property is either perfectly natural or it is not; and if it is perfectly natural, it is necessarily so, it is a perfectly natural property in *any* world in which it is instantiated. Otherwise the contrast between natural properties and those which are merely arbitrary, disjunctive or gerrymandered is a contingent one: in counterfactual situations, a perfectly natural property, charge (say), might be arbitrary and disjunctive, while grue (or worse) might count as perfectly natural. A corollary of this is that a world which differed nomologically to ours, that is, differed fundamentally in the way in which causal sequences happen, must also diverge from ours in which perfectly natural properties are instantiated there. If we can imagine a world in which gravity does not affect massive objects in the way that it does in the actual world (assuming, for the moment, that gravity and mass count as perfectly natural properties), then there must be at least one perfectly natural property instantiated in that world and not ours which is nomically connected to mass and gravity and thereby makes this difference.[59]

Also, as I remarked above, property naturalness is treated by Lewis as a primitive, unanalysable notion and the existence of a unique, elite class of perfectly natural properties accepted as a matter of brute fact.[60] I will call the presupposition that a unique, elite class of perfectly natural properties exists the *Natural Properties Principle.* (One could make an equivalent primitive assumption about the existence of a unique class of elite nomic connections which exhaustively determine the causal interactions of the world and the range of perfectly natural properties, but I will frame the following discussion in

[59]I shall not broach the issue of whether it is better to think of such 'alien' perfectly natural properties in terms of their being *uninstantiated* properties existing in isolation from the spatio-temporal world, or as *merely possible* properties. For a discussion of this issue, see Swoyer (1996).

[60]Hirsch has suggested that the Natural Properties Principle could be conceptually analysed in terms of the *overall similarity* between entities (1993, 72-3), rather than being treated as primitive. I am not convinced the suggestion really improves matters, since all this gives us is a requirement for an assumption analogous to the Natural Properties Principle which asserts the existence of an objective standard of overall similarity and difference in the world. Since the Natural Properties Principle asserts the existence of objective joints in nature, I think it already has the connotation that there is some such objective standard of similarity.

terms of the Natural Properties Principle and not its nomic counterpart.) This account of sparse properties is also compatible with more elaborate ontological pictures which appeal to universals or resemblance classes of tropes, since Armstrong's 'genuine universals' or primitive resemblance classes could correspond to the perfectly natural properties, although Lewis himself prevaricates on the matter.[61] The (almost) exhaustive investigation in this chapter has failed to provide any kind of independent analysis of universals or tropes which does not rely on a primitive assumption about the existence of an objective standard of similarity and difference, in virtue of which tropes or universals are individuated, and so it does not appear that much will be gained by invoking these additional ontological underpinnings to the account of properties.[62] I shall leave the matter open and let more exacting metaphysicians fight this battle among themselves.

2.9 Causation and Property-Instances: A Summary of the Discussions of this Chapter

It is clear that any ontology of abstract particulars, such as property-instances, is highly implausible if it does not also include some apparatus to account for relations of qualitative similarity and difference between such entities. Without this, the ontology of abstract particulars is one of bare particulars, which has insufficient ontological resources to account for the Moorean fact that distinct entities may nevertheless be of the same type and, within the context of being the causal ontology, leaves the intuitively close relationship between singular causation and generality utterly mysterious. Abstract particulars are therefore best considered as essentially being instances of general properties, or universals, or as members of resemblance classes, and the constitutive criteria of identity and individuation of property-instances parasitic upon the individuation of the general properties.

Three constitutive characterisations of general properties were considered: in terms of possibility (that any property which could exist does exist), the semantic values of predicates, and sets of actual- and other-worldly entities. However, although these characterisations may be satisfactory for some philosophical employment, they were found to result in an ontology of properties far too abundant to meet the requirements of the causal theorist, since they counterintuitively implied that causes and effects can never be redescribed and that wide-spread causal overdetermination, or a multiplicity of

[61]Sometimes he appears to consider the postulation of additional ontological underpinnings as something of an ontological extravagance. For instance, immediately after pointing out the compatibility of natural properties with universals, he adds, 'Afterwards, the universals could retire if they liked, and leave their jobs to the natural properties' (1983, 192). Later, he remains undecided (1986a, 64-9).

[62]Given this, it also seems that the trope theorists who maintained the existence of primitive resemblance meta-relations between tropes in order to hold on to a particularist account have not conceded any more to brute fact than those who countenance either properties or universals, despite Campbell's worries (see 2.2).

observably indistinguishable singular causal relations, might be the norm. The most promising alternative constitutive criterion of property identity was found to be one based on their role in nomic connections, objective relations which obtain between properties, acting as truthmakers for laws of nature. On this view, the nature of a property is determined by its relations to other properties as part of a holistic system of ontologically interdependent properties and nomic connections. From this, a picture of causation emerges which is essentially nomological; every instance of singular causation between property-instances is an instance of a nomic connection.

However, despite the population of properties being restricted to those which enter into nomic connections, the ontology of properties which this characterisation provides is still not yet sparse enough to avoid conflict with the same intuitions about causation which prompted the rejection of the alternative abundant characterisations, and there being an objective distinction between continuous and discontinuous change. The only solution available, it seems, is to jettison the egalitarianism with regard to nomically individuated properties and assume the existence of a very sparse ontology of perfectly natural properties which have the objectively special status of cutting reality at its joints, and which provide the foundations for a hierarchical ordering of nomically connected properties according to their degree of naturalness, or simplicity with respect to perfectly natural properties. Most of the population of seemingly arbitrary and causally useless properties of the abundant conception are thus ruled out from the sparse causal ontology because of their negligible degree of naturalness.

It seems therefore that any account of causation in which causes and effects are conceived of as property-instances requires some primitive assumption about the existence of an elite class of perfectly natural properties, or of some other basis for an objective standard of similarity and difference, or primitive resemblance in the world. This accepted, a coherent, essentially nomological account of the metaphysics of causation may follow in its wake, framed in terms of properties and their instances, and the way that the former are related to each other in nomic connections.

However, the discussion of the plausibility of this ontology for the analysis of causation has so far been conducted in something of a metaphysical vacuum and, as was noted in Chapter One, it is unwise to accept any metaphysical story purely on the basis of its coherence alone. Coherence is, of course, a prerequisite for the plausibility of any metaphysical system but it is not strict enough a constraint to permit choices between the competing options. Rather, competing systems must be assessed according to the philosophical implications outside pure metaphysics and via the success of their application to specific philosophical problems. In the following chapter, therefore, I will

abandon the realm of pure metaphysics to investigate some of the broader implications of this account of natural properties and the nomological model of causation.

CHAPTER THREE

CAUSATION AND NATURAL PROPERTIES

3.1 The Property Theorist's Metaphysical Picture

In the previous chapter, I argued that any metaphysical account of causation which construes individual causes and effects to be some species of abstract particular, such as property-instances or tropes, requires an assumption about the existence of a sparse ontology of perfectly natural properties, resemblance classes or genuine universals, which must be treated as primitive. To put the point another way, we must presuppose the existence of an objective standard of similarity and difference, in order to formulate any coherent metaphysical account of sparse properties as mind-independent entities, and this presupposition is not open to further analysis. Even when the identity of causal properties is characterised as being constituted by their respective roles in nomic connections, the relations which hold between general properties or universals in virtue of which causal laws are true, the population of properties which may be nomically individuated is still too abundant to provide a suitable causal ontology unless these may be ordered according to some elitist hierarchy which rates them according to their causal or nomic importance; once again, a primitive assumption is required.[1]

For convenience, I will stick with a theory of properties framed in Lewis's terminology and continue to call the metaphysical presupposition in question the *Natural Properties Principle* although, as usual, there are alternatives here to be formulated according to ontological taste.[2] This asserts that there is an elite class of perfectly natural properties which have the ontologically special status of dividing nature at its joints. In Lewis's schema, all properties are identified with sets of actual- and other-worldly entities but, for the majority of such sets which are not perfectly natural, naturalness is a matter of degree, measured for each set according to its simplicity as a set-theoretical compound of perfectly natural properties. Thus the Natural Properties Principle, together with some objective simplicity metric which marks how naturalness grades off, excludes most of the transfinite collection of abundant properties available when properties are identified set-theoretically, in favour of an elite minority of sparse properties with a high degree of naturalness. When sparse properties are adopted as the causal ontology and spatio-temporally located causes and effects are conceived of as property-instances, or entities

[1] See 2.7, 2.8.

[2] Trope theorists require an analogous assumption asserting the existence of an elite class of primitive resemblance meta-relations between tropes (in virtue of which tropes fall into 'natural' resemblance classes); and the supporters of universals require a determinate set of genuine universals. The differences between these ontological variants are irrelevant to the following discussion.

partially constituted by properties or their instances, an essentially *nomological model* of causation results; that is, since every singular causal relation occurs in virtue of the general properties its relata instantiate, the natures of which are essentially derived from the roles they occupy in nomic connections with other properties, every singular causal sequence is an instance of some nomic connection.[3]

This metaphysical picture of natural properties and nomological causation is coherent, and accords well with five of the six attributes marked out as intuitively desirable in a account of causation:[4] nomological causation is a mind-independent phenomenon; property-instances are spatio-temporally located, as we presume causes and effects to be, and yet belong to an ontology which is qualitatively fine-grained; the link between causation and generality is almost transparent, since causation between property-instances is essentially nomological; and, given the Natural Properties Principle, there is a suitable constitutive criterion of identity and individuation distinguishing sparse natural properties from each other and from entities of other ontological categories. In short, the cosmic order of things is looking very tidy. But is this the time for supporters of alternative accounts of causation to concede defeat?

The aim of the arguments in this chapter will be to suggest that it is not; at the very least, that instances of properties should not be employed to play the leading role of causes and effects in an account of causation; and at the very most, that the account of objective sparse properties which relies on the Natural Properties Principle should be abandoned altogether, if a less dubious alternative can be formulated. These conclusions result, in the first instance, from a powerful brand of scepticism which questions the possibility of our having any more than coincidental and unconfirmable knowledge of the ontology of sparse properties; even if the Natural Properties Principle is true and nature does have joints, there is reason to be pessimistic that we could ever know where these are. Secondly, the property-based, nomological account of causation runs into difficulties when its proponents attempt to account for the causal efficacy of mental properties. Even if the sceptical objection can be countered successfully, it transpires that the property-theorist still faces significant problems with the explanation of the mind.

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[3]There is, of course, a parallel formulation of this primitive assumption which asserts the existence of a unique, elite set of perfectly natural laws (or nomic connections, as I have been calling them in order to avoid confusion between the statement of a law and the nomic connection, whatever in the world makes that law true). Perfectly natural properties, on this view, would be those which are instantiated by perfectly natural laws, and other properties would be natural to the degree to which the laws in which they appeared were derivable from the perfectly natural set.

[4]See 1.3.

3.2 The Importance of the Natural Properties Principle

The Natural Properties Principle has a more general application than the nomological account of causation alone, since it is presupposed by any account of properties which aims to employ them as part of an account of causation, whether they are treated to a central role as singular causal relata or only as the relata of nomic connections. In view of this, the assumption plays an important, although perhaps more surreptitious, role in those accounts of singular causation where properties or property-instances are construed as partially constitutive of individual causes and effects. These include all those which treat causes and effects as structured complex entities, which are derivative in the sense of being constituted by ontologically more fundamental components, such as an object having a property at a time, facts or states of affairs.[5] Since all these structured complexes are invariably partially constituted by properties or property-instances, their plausibility as singular causes and effects stands or falls with the provision of a coherent metaphysical account of properties.

In fact, the only metaphysical story about causes and effects which does not involve a theory of properties immediately is that which maintains that causation relates some species of concrete particulars, either events or objects (or both). However, in this instance the account of singular causation may have to be supplemented in order to accommodate the close relationship between causation and generality and necessity, at which point the need for some theory of properties may resurface. For instance, some event theorists might want to maintain that particular events cause each other in virtue of the properties that they exemplify. Unless one joins Anscombe in regarding the closeness of the link between causation and generality as merely apparent, as being philosophical dogma rather than being indicative of any interesting conceptual connections between singular causal sequences and general causal laws, then there appears to be no shirking the responsibility to provide some account of how individual causes and effects, objects or events, exemplify repeatable entities such as properties or universals, or are members of resemblance classes or kinds.[6] The disanalogy here, however, between accounts of causation which construe causes and effects to be objects or events, rather than entities which are, or in some way involve, the instantiation of properties, is that the event theorist may not be tied to the account of sparse properties outlined which relies on the Natural Properties Principle. But, as yet, all this amounts to wild speculation and, since the *prima facie* case in favour of event causation is weaker than that which involves a

[5]See, for example, Kim (1993), Armstrong (1978; 1983), Lewis (1973; 1986c), Mellor (1991; 1995), Papineau (1993), Bennett (1988), Menzies (1989).
[6]1971, 89.

more fine-grained ontology, a more detailed examination of event causation will be postponed until the next chapter.

3.3 Why believe in Natural Properties? – Support for the Natural Properties Principle

Despite the variety of metaphysical systems in which the Natural Properties Principle plays a fundamental role, very few of those philosophers whose theories of properties require it seem to be aware that they are making such a presupposition; or, at least, they have not made their awareness explicit. For example, when arguing the case for causes and effects being property-instances, Honderich glosses over the question of their existence and individuation with a swiftness which is not uncommon in the literature: 'Evidently such individuals can be said to exist... Evidently, secondly, they can be individuated.'[7] Evidently, I do not share the same standard of what counts as evident in this case, and the charge of the previous chapter was that the existence and individuation of properties, or their instances, and the causal theories which employ them are incoherent unless one resorts to the Natural Properties Principle. However, more usually than treating the matter as evident, it is merely assumed that there is some suitable metaphysical account of sparse properties to had, to which philosophers are entitled to help themselves on the way to more exciting conclusions about science or the nature of mind.[8] There is nothing wrong with this philosophical division of intellectual labour *per se* – it is the inevitable result of having too much to explain – however, it does involve the risk that support for those more exciting philosophical conclusions (whatever they may be) is constructed upon unsteady foundations.[9]

On a more positive note, however, theories of sparse properties are not always used rather than defended. Lewis, especially, is explicit that he cannot avoid presupposing the Natural Properties Principle and invokes the distinction between perfectly natural properties and the rest in a variety of tasks, throughout his metaphysical schema. Moreover, Lewis comes up with a few more features of sparse, perfectly natural properties to enrich the primitive – but rather minimal – presupposition that such entities exist. He quotes Bealer, who maintains that natural properties 'determine the logical, causal and phenomenal order of reality'[10], furthermore, 'sharing of them makes for qualitative similarity, they carve at the joints, they are intrinsic, they are highly specific, the sets of their instances are ipso facto not entirely miscellaneous, there are only just enough of

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[7]1988, 15.

[8]For instance, Kim (1993, 333-4 and *passim*) invokes the distinction between (sparse) properties, on the one hand, and (abundant) concepts on the other, to fuel his account of reduction, supervenience and events. However, he leaves the finer details of the distinction aside.

[9]This point was raised in 0.1.S

[10]1983b, 192 (fn 6).

them to characterise things completely and without redundancy'.[11] But these characteristics do not provide a window of opportunity for the further analysis of naturalness; rather, the direction of explanation runs the other way. As Lewis explains: 'Unless we are prepared to forgo some of the uses of the distinction between natural and unnatural properties, we shall have no easy way to define it without circularity.' It is the task of physics, as Lewis sees it, is to provide 'an inventory of the sparse properties of this-worldly things. Else the project makes no sense.' Although whether the project could succeed in principle depends upon whether the natural properties instantiated in the actual world are all physical.[12]

We should believe in the distinction between perfectly natural properties and the rest, he urges, for two related reasons: firstly, it provides the only method by which the common-sense Moorean facts concerning the apparent sameness of two uncontroversially distinct particulars can be accommodated[13]; and secondly, because the Natural Properties Principle is invaluable to systematic philosophy.[14] These reasons are related to each other since, as I mentioned earlier, a theory's being consistent with the Moorean facts of common-sense is to be treated as an adequacy-condition of any metaphysical analysis.[15] So the demand embodied by the former reason is in some sense subsumed by the latter project of producing a plausible philosophical system. *If* Lewis is correct, there are certainly extremely strong reasons for accepting the Natural Properties Principle as brute fact, since alternative metaphysical systems would fail to meet an important condition of their adequacy; doing without the Natural Properties Principle might irrevocably prejudice our chances of producing a plausible metaphysical system. The conclusions of those who presuppose the Natural Properties Principle implicitly, therefore, will not be in the slightest bit controversial in virtue of this.

Nothing in this defence of the Natural Properties Principle is intended to amount to a proof of its indispensability to systematic philosophy, however. Although metaphysical theories have sometimes been presented as if some such proof could be provided, it would be a tall order to demonstrate that some particular presupposition is so important that any philosophical system would be rendered incoherent without it.[16] The likely failure of this strategy comes as no surprise, however, as Swoyer points out: 'we can rarely be certain that we have arrived at the only feasible explanation of something since new

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[11]1986a, 60.
[12]1986a, 60.
[13]Lewis (1983, 197 - 201); also see 2.8.
[14]1986, 63. Lewis is really only talking in terms of his own philosophical system here, but a key point arising from the discussions of the previous chapter is that the Natural Properties Principle is required by any account of objectively existing sparse properties; thus, Lewis's comments have a broader application than merely sustaining his own metaphysics.
[15]See 2.2.
[16]This point is discussed by Swoyer (1983; 1996, 247 - 8).

positions (and hence new explanations) are discovered even in metaphysics'.[17] The Natural Properties Principle is no different in this respect: it is certainly uncontroversially indispensable to Lewis's system,[18] and is also required by the other theories of sparse properties discussed in the previous chapter, but it may still be possible to provide an alternative theory of properties, or to dispense with the ontology of properties completely.

Fortunately for the property theorist, the unavailability of demonstrative proof is a difficulty he shares with his opponents, since any alternative analysis will face the same difficulty. This permits the property theorist to rest content with a more modest approach and defend his account, together with the Natural Properties Principle it requires, on the grounds that it offers the best explanation. This strategy promises to be far more fruitful, although it requires some qualification which Swoyer goes on to provide:

> The mere fact that a theory affords the best explanation of some local phenomenon is not enough to justify the conclusion that it's true. Sometimes the best explanation is quite feeble. Furthermore, something might explain one thing only to render other, previously unproblematic, phenomena an utter mystery (e.g., sets might explain mathematical truth only to make mathematical knowledge inexplicable). In short, the issue is not whether properties alone provide the best explanation of some local phenomenon, but whether an *entire* account of properties provides a sufficiently good *overall* account of things that is sufficiently better than the accounts of its competitors.[19]

We can, of course, still debate the question of which explanation is the best, and when the explanation afforded by a theory is too feeble for it even to qualify for our consideration. But it is clear that this mode of defence sets a goal for the property theorist which is far more attainable than some form of argument which involves establishing that acceptance of the theory of sparse properties and the presuppositions it includes is somehow mandatory.

3.4 Opposition to the Natural Properties Principle

Having established that the Natural Properties Principle, and the theory of sparse properties which presupposes it, are attractive only on the promise of their being the best explanatory apparatus for a range of philosophical tasks, there are two points at which its detractors may find fault with this account of properties. Firstly, one can provide reason

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[17]1996, 248.

[18]See Taylor (1993, Section I) for a survey of the uses to which the Natural Properties Principle is put within Lewis's system.

[19]1996, 249.

for rejecting the theory's primitive presuppositions on intuitive grounds; and, secondly, one could object to the property-theorist's claim that his theory provides the best explanation.

The former strategy provides the more head-on approach: a theory which presupposes a wholly counterintuitive principle can at least be consigned to philosophical obscurity. The truth of astrology, for instance, presupposes the existence of objective lawlike connections between the movements of stars and constellations and the minutiae of the mental life and actions of individual humans, and this significantly reduces its appeal as a putative theoretical system (on, broadly speaking, rational grounds at least). Metaphysical systems are also open to rejection on similar grounds although, in comparison with astrology, the presupposition in question is not often so obviously counterintuitive.[20]

In the case of the Natural Properties Principle, intuitions conflict about whether nature has objective joints, and seem to have done since the earliest recorded philosophical debates. Even the remaining fragments of the work of the Pre-Socratic philosophers suggest that some, such as Empedocles, maintained the objective division of the world into distinct elements; while others, such as Anaximander, Anaxagoras, Parmenides and Melissus denied this division in one way or another. Empedocles declared 'Hear first the four roots of all things: bright Zeus [fire], life-giving Hera [air], and Aidoneus [earth], and Nestis [water]' and argued that all other things (including the soul[21]) are generated by the combination of these fundamental elements.[22] He elaborates that '...each [element] has its own character; and in turn they come to power as time revolves. And in addition to them, nothing comes into being or ceases'; and appears to have associated specific causal powers with each element, 'In general, fire divides and separates, water is adhesive and retentive, holding and gluing by its moisture.'[23] On the other hand, Parmenides wrote that 'there are signs in plenty that being ...is ungenerated and indestructible, whole, *of one kind* and unwavering, and complete'[24], while Anaxagoras

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[20]An example of this might be objections to Leibniz's metaphysics which directly dispute the truth of his Principle of Sufficient Reason.

[21]See Aristotle, quoted in Barnes (1987, 189).

[22]*On Nature*. See Atchity (1996, 120). Unlike their modern descendants, the Pre-Socratic philosophers who maintained that Nature is objectively divided tended also to maintain that it is possible to know *a priori* (or after very little scientific enquiry) what these fundamental elements are. Since Empedocles' claim is about 'all things' (including man and the soul), I will interpret him as asserting the existence of an *objective* division in nature, the four elements being the way nature divides itself.

[23]In Barnes (1987, 166 and 176).

[24]The Way of Truth. See Barnes (1987, 134) (my italics). One might wonder how Parmenides is entitled to make this claim, since he professes that we cannot say anything true about the One except that 'It is.' However, I am not concerned here with the consistency of the Pre-Socratic views cited, nor the soundness of their arguments; rather, these views are included for illustrative purposes within the current discussion concerning the intuitions which guide different metaphysical accounts of causation. I take the liberty to

maintained that 'all things will be in everything; nor can they be separate, but all things possess a share of everything.'[25] The interpretation of such ancient fragments of philosophical thought presents well-known difficulties, but it seems fairly clear that the latter two claims about the ultimate nature of Nature are incompatible with it having objective qualitative joints, unlike the former fragments from Empedocles and the Aristotelian tradition from which Armstrong draws his modern theory of genuine universals.[26] The debate survives in contemporary philosophy, and two and a half millennia of principled reasoning seems to have done little or nothing to resolve the conflicting intuitions; while property theorists such as Lewis are happy to treat the Natural Properties Principle as primitive, Barry Taylor confesses to 'finding these joints utterly mysterious, the manner of carving entirely arcane'[27] Elgin gives up on trying to comprehend perfectly natural properties, exclaiming 'Doubtless there are more things in heaven and earth than are dreamt of in my philosophy'.[28] And Putnam resorts to calling Lewis 'spooky' and 'medieval-sounding' for saying that reality sorts things into kinds.[29]

Intuitions conflict about the truth of the Natural Properties Principle, and the sheer longevity of this intuitive clash suggests that there is no prospect of a knock-down argument against the principle itself. Moreover, whatever the charges brought against this principle, some claims in metaphysics must be treated as primitive and if property theorists persist in claiming that the Natural Properties Principle is one of these, a philosophical stalemate will be reached. The more fruitful strategy for its detractors to take is to investigate the implications of accepting the Natural Properties Principle; that is, the implications of the theory which requires it. This theory, it is claimed, offers the best explanation of causation and much more besides and the question of whether or not it does so must be addressed even by those committed to the Natural Properties Principle. The most promising route by which to evaluate the property-based account of causation, therefore, is to proceed from this common ground.

3.5 The Threat of Classificatory Scepticism: How do we know which Natural Properties there are?

I will now move on to look at some consequences of accepting the theory of sparse properties, and the Natural Properties Principle, and consider a serious difficulty with the account as a whole.

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do this because one of the predominant concerns in the Pre-Socratic works cited is the explanation of generation and change, a topic which is not so dissimilar to that of causation.

[25]*Physics*. See Barnes (1987, 229).

[26]See Armstrong (1978, xiv-xv).

[27]1993, 88.

[28]1995, 291. (The comment is a paraphrase of Goodman (1954, 34).)

[29]Quoted by Lewis (1984, 229).

The problem in question is that the theory of sparse properties is open to a form of scepticism, which I will call *Classificatory Scepticism*, and which concerns our epistemic position with regard to the metaphysical theory of sparse properties: what relationship does the latter bear to the theory of the world we have, or the theory which we could have? On an ontological level, perfectly natural properties are interdependent with the fundamental nomic connections which ultimately govern all the causal interactions in the world. Whether one opts for the Natural Properties Principle, which takes the existence of an elite class of perfectly natural properties to be primitive, or one opts for the nomic parallel of that principle which assumes the existence of a elite, primitive class of nomic connections, the system is holistic, since nomic connections are immediately defined in terms of perfectly natural properties, or perfectly natural properties immediately defined in terms of fundamental nomic connections. The question then is whether we could ever be in an epistemic position to break into this holistic ontology; whether there is any possibility of our gaining epistemic access to perfectly natural properties and perfectly natural nomic connections. We are faced with the question of how we know which natural properties there are. If discovering perfectly (or, very highly) natural properties is in principle impossible, then there will be no reason to regard our scientific theories as true, however comprehensive and successful they may be, since the whole truth of the actual world is determined, by definition, by which perfectly natural properties and nomic connections exist.

Moreover, since this result would severely damage the eligibility of property theory to be considered as the best explanation of the causal ontology, the attraction of the whole metaphysical picture of sparse properties is beginning to wane. The Natural Properties Principle was presupposed as a primitive and unanalysable assumption in order to get the ontology of sparse properties up and running which, in metaphysical isolation, it does quite coherently. But, once accepted, it creates a rift between epistemology and metaphysics: on the one hand, there are the entities and laws which figure fundamentally in our scientific theories; on the other, metaphysics tells us that there is an elite causal ontology of perfectly natural properties and fundamental nomic connections. The causal ontology of sparse, perfectly natural properties is the worst kind of irrefutable theory – not that it, *qua meta*physical theory, should be *empirically* verifiable, or refutable as Popper would have liked – but if the entities it postulates are inaccessible from our epistemic perspective, the case for accepting this account of the metaphysics of causation seems irrevocably weakened, and it becomes harder to take seriously any untoward consequences that its acceptance would have (should it entail problems in the philosophy of mind, such as accounting for mental causation, for example).

I will initially present the argument in a form which, for convenience, does not take into account rejoinders which different property theorists have already made to remedy their predicament, treating the matter only as an issue about sparse properties and nomic connections. Most property theorists acknowledge that this argument reveals a serious *prima facie* difficulty with the metaphysical theory as it stands,[30] and that something must be added to ensure that some relation (preferably identity) holds between sparse properties and the entities which the predicates of our most simple and comprehensive theory pick out. The issue where they diverge enormously concerns what that additional something is, which comes down to a debate about which of the premises in the argument below to reject. I will therefore not confuse the issue further by investigating the possible responses while presenting the argument, and turn to consider those in the next part of the discussion.[31]

3.6 The Argument for Classificatory Scepticism

The metaphysical picture of sparse properties presupposes the Natural Properties Principle, the existence of an elite minority of perfectly natural properties and an objective standard of simplicity-with-respect-to-perfectly-natural-properties which determines a hierarchy of other (non-perfectly natural) properties, ordering them according to their degree of naturalness. The real metaphysical divide is between the perfectly natural properties and the rest, for the range of perfectly natural properties includes precisely the minimum range of fundamental qualities required to determine all the causal interactions in the world; that is, to exhaustively fix the causal ontology. This class of properties is, as Elgin puts it, the 'metaphysical aristocracy' (although perhaps these social metaphors will soon break down, since, if the property theorist is right, the perfectly natural members of the aristocracy do all the causal work).[32]

This is the ontological story; but what are its implications for our epistemic position with respect to perfectly natural properties? For a start, it seems extremely unlikely that perfectly natural properties will be among those which we could unproblematically be said to observe. Our everyday predicates with which we describe ordinary middle-sized objects, such as 'green', 'round', 'heavy' and so on, do not pick out entities which are likely to be counted as *perfectly* natural properties, although they presumably have a high degree of naturalness; more so than the less intuitively simple gruesome predicates, which outside James Joyce's novels,[33] tend to be saved for special philosophical occasions, but

[30]Lewis (1983b, 218 - 227; 1984), for instance, provides a characteristically explicit response to a similar objection.
[31]See 3.7 - 3.11.
[32]Elgin (1995, 299).
[33]Goodman's 'grue' and 'bleen' are appropriated from an earlier descriptive usage in Joyce's *Finnegans Wake* (1939); the explicit definitions of these terms are due to Goodman.

which we can, nevertheless, learn to recognise by their instances.[34] In contrast to these more or less natural properties which we refer to with the predicates of our pre-scientific vocabulary, it appears that we must discover the *perfectly* natural properties via the confirmation of a theory. In accordance with this, Lewis's paradigmatic examples of perfectly natural properties include the usual suspects for someone of his physicalist persuasions: quark colour and flavour, charge, mass and so on, the properties which, at the moment, look as if they might figure in the fundamental laws of physics. Together the ontological and epistemological accounts combine into a variant of what Armstrong calls '*a posteriori* realism'[35] and he adds that 'such a doctrine makes possible the reconciliation of an empiricist epistemology... with ontological realism about [genuine] universals', or perfectly natural properties.[36]

It will be useful here to distinguish the notion of a *fundamental* theory, which includes all and only the fundamental laws of physics[37] and predicates picking out perfectly natural properties, from that of a (plain) theory, which includes the fundamental theory and all the predicates and laws subsuming the causal behaviour of natural properties. Call the predicates of the fundamental theory *primitive* predicates; the predicates of the theory are ordered according to their degree of primitiveness, or simplicity with respect to the primitive predicates and fundamental laws, in what I will call the *theoretical* hierarchy. We can allow that both the objective hierarchy of naturalness of properties and of primitiveness of predicates are quite complicated and multi-dimensional, such that, in the former case for instance, two properties could be natural to an equal degree and yet figure in subsystems of nomic connections which are unrelated to each other except via the fundamental nomic connections and perfectly natural properties. (The properties of being a thoroughbred (horse) and being a spiral galaxy might be contenders here: both might be equally closely related to perfectly natural properties, and yet thoroughbreds and spiral galaxies are unlikely to be closely associated in any system of nomic connections.) However, simplifying the matter for the moment into a linear hierarchy, one can imagine that the objective ordering of natural properties might look something like the paradigmatic ordering of scientific disciplines as presented in discussions of the unity of

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[34]Since 'green' and 'grue' are observationally indistinguishable, we can, ex hypothesi, recognise the latter by its instances, if we can recognise instances of the former. (See Elgin 1995, 290).

[35]I am using this term more broadly than Armstrong does, since he is specifically concerned that the 'realism' be realism about objectively existing *universals* rather than perfectly natural properties. However, since these finer ontological disagreements are not at issue here (see 2.1), the name will serve as well for realism about the existence of an elite set of perfectly natural properties, or resemblance classes of tropes, which can be discovered via scientific enquiry.

[36]1978, xv.

[37]To simplify the discussion, I shall assume physicalism here; that is, that the perfectly natural properties of the actual world are all physical ones. An adherent of the Natural Properties Principle need not agree with this physicalist claim, but nothing in the following argument depends upon its truth, and non-physicalist alternatives will be considered later in the chapter. See 3.15.

science.[38] Thus, an *ad hoc* selection of properties and families of properties might roughly be ordered along the following lines (in order of increasing naturalness): grue*... grue... green... biological properties... chemical properties... physical properties... micro-physical properties (which are perfectly natural).[39] Moreover, if Lewis is correct, the theoretical hierarchy of predicates should be isomorphic to the objective ordering of property naturalness, from 'grue*' which our theories can well do without including altogether, to 'strangeness', 'charm' and so on which are primitive predicates featuring in the fundamental theory.

The property theorist does allow that our methods of scientific confirmation produce theories which are modestly underdetermined by observation in the way that Pierre Duhem famously pointed out.[40] A hypothesis or theory is not entailed by the evidence for it, since when confronted with a recalcitrant observation in the course of the confirmation of some hypothesis, the conflict between theory and evidence may be due to the falsity of the hypothesis itself, or to the falsity of one, or some, of the auxiliary assumptions of the wider theoretical background. This much is an uncontroversial feature of the scientific method and it is usually presumed that the matter can be resolved to some extent by further observation. A current example of this is to be found in neuro-pharmacology, where electro-physiological experiments into the behaviour of NMDA receptors have given different results depending upon whether these are located in the brain or the spinal cord. At the time of writing, the experimenters are unsure whether this discrepancy in the results is due to there being a difference in the behaviour of receptors depending upon their location in the body, or whether it can be attributed to incorrect assumptions about the workings of the intricate experimental equipment.[41] But, this variety of Duhemian underdetermination is par for the course in science and it is presumed that a principled choice between which assumptions should be rejected can be guided by further observations. So *a posteriori* property realists need not be troubled by these difficulties any more than their opponents and they do not, in general, expect that the project of discovering which perfectly natural properties there are via the confirmation of a fundamental theory will guarantee that the primitive predicates refer to perfectly natural properties with absolute determinacy. It is enough for the *a posteriori* property realist that primitive predicates refer to properties which have a high degree of naturalness; as Lewis says, 'there is a trade-off' and 'the terms of the trade are vague',[42] the

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[38]See, for instance, Oppenheim and Putnam (1958).

[39]'grue*' is a highly disjunctive property invented by Elgin, defined to have thirty-seven disjuncts and be equivalent to 'examined before 2000 and found to be green, or examined between 2000 and 2005 and found to be blue, or examined between 2005 and 2010 and found to be yellow, or...' (1995, 292).

[40]Duhem (1906).

[41]I am grateful to Dr G M Green and Dr A Gibb of University College London for bringing this example from their own work to my attention. (The discrepancy is not thought to be due to experimental error, so I will ignore that option.)

[42]See Lewis (1984, 228); also, see 3.9.

inevitability of modest theoretical underdetermination does not make for a serious deficiency in the property theorist's account of how we know which natural properties there are.

However, the classificatory sceptic objects that this account of our discovery of perfectly natural properties is afflicted by a more serious form of the Duhemian problem: the confirmation of a theoretical hypothesis by observation does not only assume the truth of the auxiliary background assumptions, as Duhem noted, but it also assumes that the system of classificatory predicates in which both hypothesis and assumptions are formulated is one which marks out (more-or-less) objective similarity and difference in nature. This may be thought to be merely yet another theoretical background assumption, and hence just another variant of the Duhemian underdetermination discussed above, but it is crucially different in that it cannot itself be empirically confirmed or disconfirmed. Observation cannot tell us whether our system of theoretical classification is, as a whole, correct or incorrect.

The difficulty at hand is one closely related to that for which the nomic constraint upon property identity was rejected in the previous chapter.[43] This failed as a constitutive criterion of sparse property identity precisely because the population of nomically individuable properties is far too abundant to serve as the causal ontology; we can formulate and confirm a huge number of laws (on the basis of the same observations) but we are not intuitively disposed to maintain that the predicates of within *all* of them pick out sparse, causal properties. Many theories explain the same data. The problem for *a posteriori* realism is that when we have a theory which apparently refers to perfectly natural properties, it is a simple enough matter to create a 'strange' theory which would be confirmed by the same observations and yet its primitive predicates would carve up the world differently from the original theory. Take Hirsch's example of a strange language of chemistry where our chemical vocabulary is replaced on a wide scale with terms which divide the world in a different way.[44] Thus, words such as 'oxygen', 'radium' and 'carbon' are replaced by words such as 'oxium' and 'rabon' which are equivalent to 'oxygen or radium' and 'radium or carbon' respectively. 'Oxygen' is then equivalent to 'oxium and not rabon', 'carbon' to 'rabon and not oxium' and 'radium' to 'oxium and rabon', assuming that the English terms are mutually incompatible. Then, for each of the chemical laws we can formulate and confirm in our vocabulary, there is an equivalent in the strange chemical theory.

For instance, the hypothesis that:

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[43]Namely the proposal that the realm of sparse properties be restricted to those which play a role in nomic connections, the objective relations in the world which make laws of nature true (see 2.7).
[44]1993, 80.

The conjunction of heat and oxygen (nomically) necessitates combustion.

would be confirmed by the observation of instances of the presence of heat and oxygen and the occurrence of combustion. But, assuming 'combustion' and 'heat' to be terms common to both chemical languages,[45] a strange chemist would construe these instances as the presence of heat, oxium and combustion, thereby confirming her own hypothesis:

> The conjunction of heat and oxium which is not rabon (nomically) necessitates combustion.

The instances by which we confirm chemistry serve to confirm strange chemistry, and many stranger theoretical permutations should we wish to construct them. Moreover, although the strange chemical hypothesis above is less simple than the English one, strange chemistry involves fewer predicates and thus is more parsimonious, apparently picking out a sparser ontology of chemical properties.[46] Thus, it is not immediately obvious that strange chemistry would be any less predictive, explanatory, or comprehensive for the speakers of strange languages, than our best English chemical theory is for English speakers. Although the terms of the English and strange theories are translatable into each other, the terms of the two theories are not just terminological variants of each other for the purposes of the discovery of highly natural properties, since the property theorist's claim that the primitive predicates of a theory directly refer to the most natural properties implies that English chemistry and strange Chemistry carve up the world in different ways. The worry which the *a posteriori* property realist must address is that, with our talk of oxygen and other English chemical properties, we might be talking about something strange and have no way of knowing whether this is the case.

The theoretical hierarchy of kinds in strange chemistry presumably favours a strange fundamental physical theory, which contains primitive predicates not found in our own physics and therefore carves the world up in a different way. Since the truth of the Natural Properties Principle is being assumed, only one of these fundamental theories carves nature at its joints, its predicates picking out the perfectly natural properties; the primitive predicates of the others refer to strange, gruesome entities. The empirical observations, by which we were supposed to discover (at least in principle) which perfectly natural properties exist, are not fine-grained enough to confirm our scientific theory rather than a strange one, and so they cannot help us determine whether our fundamental physical theory is the one which picks out the perfectly natural properties.

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[45]This assumption is not necessary to the example, it merely simplifies it.

[46]Whether this would remain so as strange chemistry is expanded is not clear, but neither is it clear that chemistry would retain the advantage of having simpler hypotheses compared to strange chemistry.

As Putnam observes, the problem is 'that Nature, or "physical reality" in the post-Newtonian understanding of the physical, has no semantic preferences. The idea that some physical parameter, or some relation definable in terms of the fundamental parameters of physics, simply cries out for the role of mapping our signs onto things has no content at all.'[47]

The property theorist cannot appeal to the objective hierarchy of property naturalness in order to support the kinds of our science over those of strange science, for then his epistemological account about how we know about perfectly natural properties becomes circular. On the objective ordering, the naturalness of a property is measured according to simplicity-with-respect-to-perfectly-natural-properties, but from the perspective of our theorising, we do not know what the perfectly natural properties are, nor how naturalness of properties is determined in terms of them.[48] Therefore, as Elgin points out, 'they cannot figure in our assessments of simplicity' and so '[t]he objective simplicity Lewis recognises may be a legitimate end of science, but it cannot be a means of achieving science's ends.[49] Even if we regard the pre-scientific predicates of our everyday discourse as picking out properties which have a relatively high degree of naturalness, we do not know, objectively speaking, to what degree. There seems to be no reason to suppose that the internal simplicity of the theoretical hierarchy of predicates would be isomorphic to the naturalness ordering of objective sparse properties, because the actual world about which the Natural Properties Principle is true might be, ontologically speaking, exceedingly gruesome and disorderly (relative to the properties picked out by the primitive predicates of our fundamental theory). The same applies to other theoretical virtues, such as parsimony, which the property theorist might want to objectively ground by appealing to the Natural Properties Principle: the ontology of perfectly natural properties is presumed to be sparse, but we could not know how sparse until we know how many perfectly natural properties there are.

Moreover, *a posteriori* realists of the physicalist persuasion under discussion also admit that, since the primitive predicates which refer to perfectly natural properties are not among those of pre-theoretical ordinary language, there is no likelihood of a naive realist account of how we get to know about which perfectly natural properties there are; rather, they maintain that we discover perfectly natural properties via the confirmation of our theories. But, it seems that empirical observation is insufficient to guarantee that our fundamental physical theory will ultimately carve nature at its joints, rather than its primitive predicates referring to strange entities. Nor will assiduous application of

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[47]1984, 5.

[48]Lewis's objective standard of simplicity for theories consists in simplicity of formulation in a language which has primitive predicates that pick out perfectly natural properties, but such a language is not available to working scientists.

[49]1995, 295.

theoretical virtues help the matter, since judgements of naturalness, simplicity or parsimony cannot be evaluated with respect to their accordance with objective naturalness, simplicity or parsimony. Since reference to perfectly natural properties is supposed to be the ultimate goal of science, we cannot use the objective hierarchy of property naturalness to guide theory-choice, or choice of theoretical terms; we could only measure the *objective* naturalness of the properties our predicates refer to *if* we knew which perfectly natural properties existed.

In view of these observations, the empiricist epistemology favoured by the *a posteriori* realists does not appear to do all the work required of it: while it permits us to confirm hypotheses about the happenings we observe in the world, and consequently allows generalisation, prediction and explanation, it falls short of providing some method by which to determine whether our fundamental theory carves nature at its joints. Even if the Natural Properties Principle is true and there is, ontologically speaking, an elite set of perfectly natural properties which causally govern the actual world, we have no grounds whatsoever upon which to justifiably claim that our primitive predicates refer to perfectly natural properties. There are many strange fundamental theories and only one which fits the structure of the perfectly natural world, so our chances of just hitting on the latter by accident are extremely slim (and even if we did, we wouldn't know that we had). A consequence of assuming the Natural Properties Principle appears to be that the ontology of sparse perfectly natural properties and fundamental nomic connections is an ontology which is inaccessible in principle from our epistemic position.

Furthermore, as Elgin remarks, since the supporters of objective natural properties maintain that 'only a theory that restricts itself to natural properties has what it takes to be true', they have contrived a new form of scepticism.[50] If we cannot find out which perfectly natural properties there are, then we do not know whether any of our current theories are true, no matter how useful they may be for prediction and explanation. The Classificatory Scepticism which doubts the correspondence between the predicates of our fundamental theories and perfectly natural properties has led to doubt about the truth of our science.

3.7 Responses to Classificatory Scepticism

As I mentioned above, this untoward result that the causal ontology of natural properties exists in isolation, perpetually beyond our epistemic grasp, is one of which more sophisticated sparse property theorists are all too painfully aware. There are several responses to it, some more satisfying than others, but none of them, I think, are

[50] 1995, 296.

conclusive and thoroughly convincing. Having said that, this is not a claim I will be able to demonstrate conclusively, since this would involve careful examination of the larger part of the project of defending industrial strength[51] scientific realism in the philosophy of science; and even then, it is still an on-going project. The best I will be able to do is to try to shift the burden of proof onto those *a posteriori* realist philosophers of science and sparse property metaphysicians who maintain that perfectly natural properties are not *in principle* inaccessible from our epistemic perspective.

Having done so, I will go on to suggest that the proof in question may not be worth chasing: the industrial strength realist is trying to explain how the predicates of our fundamental theory hook onto perfectly natural properties, but the metaphysician has only got his objective ontological picture of property causation off the ground by presupposing the Natural Properties Principle, which asserts the existence of the entire ontology of sparse properties. The main support for the Natural Properties Principle, however, was by inference to best explanation, based upon its utility within systematic philosophy, and it cannot have much utility in explaining anything outside metaphysics if the entire sparse property ontology is epistemologically sterile. Although the Natural Properties Principle may be an indispensable assumption of certain metaphysical theories, it has created an huge epistemological problem for the philosophy of science. At this point I begin to get misgivings about the metaphysical theory of objective sparse properties, the magnitude of which Hume might have been proud: what if the project of industrial strength scientific realism is a project of trying to find a fit between science and some coherent, consistent and yet 'false and adulterate' metaphysics? We do not, after all, worry too much that our scientific account of the world's causal interactions does not fit in with an ontology of Leibnizian monads. Perhaps, with Hume, it is time to 'subvert that abstruse philosophy and metaphysical jargon, which, being mixed up with popular superstition, ...gives it an air of science and wisdom'.[52] To put the point less grandly, I will suggest acceptance of the metaphysical account of sparse properties, especially as it is applied to account for the metaphysics of causation, should be withheld until alternative options have been thoroughly explored.

The responses to the argument for Classificatory Scepticism adopt one of two strategies: they either aim to resolve the problem by defending some strong version of scientific realism about the terms in our theories (a project which I have been calling 'industrial strength realism'); or they get rid of the problem by fiat, by making further assumptions about our having favourable epistemic access to the objective ontology of

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[51]Following Fodor I will call the brand of scientific realism 'industrial strength' realism to contrast it with less stringent realist accounts of the relationship between our theories and the world than their primitive predicates referring to an elite set of perfectly natural properties (see 5.13 - 5.16).
[52]1777, 12.

sparse natural properties, to the effect that our primitive predicates do pick out highly natural properties.

3.8 The Industrial Strength Realist Project

There is little collective agreement among those who choose to adopt the former strategy and so I will merely mention directions in which the property-theorist-cum-philosopher-of-science may take. Firstly, one can object to the suggestion that there could be competing fundamental theories by attempting to show that there would be no conflict between our fundamental theory and that of the strange scientists, because ultimately the two competing theories will merge.[53] The idea here is that our theory, and all the various strange theories, will *converge* towards one true fundamental theory; despite the high level conflicts, there is only one way of explaining the world, a way which has few enough primitive predicates which pick out a sufficiently sparse population of perfectly natural properties. One might argue, for example, that ourselves and the strange scientists will all have to resort to the superstring theory (say) in order to provide an account of the behaviour of quarks, or strange quarks (respectively) and that, at this point, our fundamental theory will not diverge from the strange one in its ontological commitments. This would be a happy result for the property theorist, but I don't have much clue how one might begin to defend this position.

A second direction for the scientific realist project would be to deny that there is *no* internal feature by which our fundamental physics and strange fundamental physics would be distinguishable, in terms of their theoretical virtues and explanatory power, and thus deny the classificatory sceptic's claim that there is nothing inherently better about a theory which cuts nature at the joints than one which does not. There is a close connection here with a much more general philosophical problem, explicitly formulated by Hirsch as 'The Division Problem', which is to explain the normative intuitions 'that it would be in some sense incorrect or irrational for us to employ a language that divides reality in some way significantly different from our ordinary way'.[54] The realist about the entities our scientific predicates pick out would have to argue for some biconditional claim: that a theory would have a certain feature (being successful at explanation, say) *if and only if* its primitive predicates referred to perfectly natural properties. The problem here is that it would be very difficult both to support the claim that the imbalance of some theoretical virtue or other between our theory and strange physics was not merely an imbalance as viewed from our theoretical perspective, *and* that the fact that the theory

[53]Although not 'merge' merely in the sense of it being possible to conjoin them, as an egalitarian about properties could maintain. This was rejected in the previous chapter as a suitable conception of properties for the causal ontology.
[54]Hirsch (1993, 3).

had that particular theoretical virtue was due to the predicates of the theory referring to perfectly natural properties; that is, was determined by the theory carving nature at its joints.[55] Hirsch suggests that there being objective joints in reality – that is, the Natural Properties Principle being true – does not obviously entail any principle which maintains that a language which divides reality at its joints is any better than one that does not[56] (although he speculates that 'it has often been tacitly assumed...since Plato that the division problem is immediately solved (or at least substantially diminished) for someone who believes in the objectivity of reality's joints').[57] But the failure to find some distinguishing feature between natural and unnatural theoretical systems does not demonstrate the negative existential claim required by the classificatory sceptic that *there is no such feature.* This is perhaps the weakest point of the classificatory sceptic's argument, and those of a realist persuasion need not stop searching for some feature or other which could play this role. Personally, I am pessimistic about the prospect of there being some theoretical feature which fits into the biconditional, although I cannot hope to dismiss this entire strategy here. I will not involve myself in the intricacies of the debate, therefore, but accord it the status of an on-going project to bridge the gap, pointed out by the classificatory sceptic, between science and the objective ontology of sparse properties and fundamental nomic connections.

The final response which employs the first strategy is to object to the first premise of the argument, by denying that the only primitive predicates are those which occur in the fundamental theory as the product of our scientific endeavours. This amounts to finding another point at which our theoretical vocabulary directly refers to objective entities and, upon this foundation, explicating a new way in which the predicates of our theories pick out increasingly natural properties the more fundamental the theory they appear in, or at least that there is some way in which our fundamental theory can be said to represent the world and considered to be approximately true. This latter option is included because a realist who took this line could resort to some Russellian, descriptivist account of the predicates of the fundamental theory, such that these terms do not refer directly to objective entities but are introduced by a process of Ramseyfication.[58] As such, primitive theoretical terms are denoting definite descriptions which are contextually defined by other terms in the theory with the 'higher-level' predicates being those which directly

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[55]This difficulty harks back to Elgin's discussion of Lewis's account of simplicity (1995, 289-302) mentioned in 3.6. The danger here is that the industrial strength realist will also have to evade Putnam's result (from the model theoretic proof based on the Löwenheim-Skolem theorem) that *any* ideal theory, one satisfying all our evidential and theoretical desiderata, has a mapping onto the world which makes it come out true (Putnam (1978, 125-6) and (1981, Chapter 2 and Appendix)). Some of the implications of Putnam's argument are similar to the conclusions which I will reach, albeit by a different route, and against some criticisms, such as that from Lewis, my argument and Putnam's would stand or fall together.

[56]1993, ch. 3.

[57]1993, 52

[58] See Lewis (1970).

refer. One might argue, for example, that some objective properties are directly accessible from our epistemic perspective, on the grounds of their being 'response-dependent' or 'response-privileging' properties, that there is a class of concepts which hook us on to objective, mind-independent natural properties in an *a priori* fashion.[59]

This strategy might be successful, but it faces three distinct challenges. Firstly, to find a class of 'primitive' referring predicates, or response-privileging concepts which pick out objective, 'cosmocentric' properties, rather than features of the world which would be counted as 'anthropocentric', or defined by their ability to affect human minds in certain ways.[60] Otherwise, there is no guarantee that fundamental theories formulated on the basis of such predicates will involve properties of a high degree of naturalness. Secondly, those who adopt the strategy of treating the predicates of the fundamental theory in the manner of Russellian definite descriptions have to justify their claim to have an account of the introduction of theoretical terms by a process of Ramseyfication which will not result in wildly diverging fundamental theories.[61] Thirdly, they need to make sense of the notion of theories being 'approximately true' without circularity; that is, without recourse to saying that the terms in such theories refer to perfectly natural properties, or something similar. In addition to this, they need to defend their account against the charge that giving a Russellian characterisation of the predicates of fundamental physics is really a defence of industrial strength realism at all, rather than some weaker, more environmentally friendly realism: in what sense can our fundamental theory be said to represent the objective ontology of perfectly natural properties, if the predicates within it do not directly refer to the properties in question, but only denote? It seems to me that someone who opts for this response against the sceptical argument would do well combine it with the second strategy and defend the claim that a theory which carves nature at its joints is more empirically successful in some respect than one which does not.[62] Otherwise, they may be forced to admit that their version of realism does not have the strength to maintain the epistemic link between the terms of our theory and the objective ontology of sparse perfectly natural properties, which the Natural Properties Principle asserts the world contains.

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[59]See Pettit (1998).

[60]For a discussion of this see Mišcevic (1997, 115-22) on Pettit's account.

[61]This problem is raised by Winnie (1967), and mentioned by Lewis (1970, 84) who evades the problem by stipulation.

[62]This, as Laudan points out, includes defending the claim which is central to this defence that the more approximately true a theory is, the better it will predict and explain (1984, 230 - 4). This difficulty is also discussed by Fine (1984, 264 - 6).

3.9 The Anti-Sceptical Stance

The second strategy for circumventing the result of the sceptical argument is to bite the bullet and simply make further assumptions to alleviate the rather dire epistemological problems which afflict the ontology of sparse properties and nomological causation. This, most famously, is Lewis's way out, but his suggestion is probably tacitly accepted by many of those who subscribe to the metaphysical picture of perfectly natural properties and fundamental nomic connections, and the *a posteriori* nature of our discovery of them.

Lewis attempts to back up his realist convictions by revealing a 'saving constraint' in the world which ensures that the referents of the property terms of our fundamental theory are perfectly natural properties. These are *'eligible'* to be the *bona fide* referents of our fundamental theory in virtue of factors which are independent of us, whereas gruesome predicates (or worse) do not pick out such eligible entities. Eligibility, like the Natural Properties Principle itself, is an objective standard of similarity and difference that you have to be a realist to understand: 'realism needs realism', as Lewis admits.[63] It is also a matter of degree, proportional to a property's naturalness. As Elgin describes Lewis's account:

> Like eligibility of bachelors, eligibility of properties wanes when entanglements become too complicated. And even if we are not sure exactly where the boundary lies, eventually it is obvious that we are on the other side.[64]

So, from the perspective of our theory, there is a trade off between simplicity and the objective truth which would come from referring only to the elite set of perfectly natural properties, but, as Lewis allows, 'The terms of trade are vague; that will make for moderate indeterminacy of reference; but the sensible realist won't demand perfect determinacy'.[65]

But this objective saving constraint alone will not alleviate the epistemological problems; eligibility is an objective feature of the world, an attribute of perfectly natural properties, which 'in no way turns upon our having any special – or indeed any – access to the properties that possess it'.[66] (If it were not, it would fall foul of Putnam's Proof, as being 'just more theory'.[67]) For this, Lewis invokes yet another assumption: natural properties are not only more eligible to be the referents of our theories, they are also more eligible to figure in the contents of our propositional attitudes. According to Lewis, it is not only essential that 'we have an independent, objective distinction among properties',

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[63]1984, 228.
[64]1995, 292.
[65]1984, 228.
[66]Elgin (1995, 293)
[67]That any ideal theory will have a mapping onto the world upon which it will turn out true. See Putnam (1981).

we must also 'impose the presumption in favour of eligible content *a priori* as a constitutive constraint'; that is, natural properties feature in the contents of our attitudes because 'naturalness is part of what it is to feature therein.'[68] With this, Lewis has effectively freed himself from the whole sceptical argument by fiat, and is quite entitled to challenge those who persist in opposing him to a battle of incredulous stares.

This strategy is a metaphysician's approach to the problem; as Elgin remarks of Lewis, 'the character and fate of empirical science are not among his central concerns'.[69] As was argued above[70], the Natural Properties Principle has to be presupposed by the sparse property theorist, but then the sceptical argument shows that accepting this principle precludes the causal ontology from doing any epistemological work. This is bad news for the property metaphysicians, since the main recommendation for their metaphysical picture, and the acceptance of the Natural Properties Principle as primitive, was by inference to best explanation, based on the utility for systematic philosophy in general of accepting this presupposition. On the basis of the sceptical argument, therefore, someone who was prone to take their ontological commitments to natural properties less seriously might well argue that the metaphysical theory of sparse properties that the Natural Properties Principle facilitates has far less claim to be the best explanation than any account of the metaphysics of causation which attempts to do without it, at least in the formulation which sparse property theory demands. To have the epistemological problem resolved by a further assumption might leave all but the pure metaphysicians slightly dissatisfied: just how much must be accepted as primitive in order to render their metaphysical story plausible?

To be fair, however, Lewis regards this second epistemological assumption as being a perfectly plausible response to the sceptical conclusion which the Natural Properties Principle implies. Classificatory Scepticism is, after all, just another form of scepticism and a simple lack of certainty does not usually drive us to reject much of what we believe. The radical scepticism which denies the existence of the external world, or other minds, for example, is kept firmly in its place in philosophical discourse and not permitted to infect all the reasoning we do. So why not reject Classificatory Scepticism, by rejecting the possibility that our theoretical terms do not refer to natural properties? In response to Putnam's Proof, Lewis gives the following assessment:

> We are in the presence of a paradox here, as surely as when we meet the man who offers us a proof that there are no people, and in particular that he himself does not exist. It is out of the question to follow the argument where it leads.[71]

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[68]1983, 226-7.
[69]1995, 291.
[70]In 3.6.
[71]Lewis (1984, 211). The proof to which he refers is Peter Unger's 'Why there are no people' (1979).

So, by implication, we shouldn't be troubled by the Classificatory Sceptic's worry that our taxonomy of our theories is globally incorrect, and thus that none of the terms of our theories divide the world up in the way it is divided,[72] and people who persist in being worried about this deserve to end up in the same asylum as those people who have become seriously convinced that they don't exist.

3.10 A Fly in the Anti-Sceptic Ointment

I accept Lewis's point about the correct response to radical scepticism; however, I do not think that the Classificatory Scepticism implied by accepting the Natural Properties Principle is of the same order, since it differs from those common kinds of sceptical argument we feel perfectly entitled to reject. There is a marked disanalogy between radical scepticism and the sceptical problem of classification discussed in this chapter, which is to be found in the implications of accepting the respective sceptical arguments. The claims that the traditional, radical sceptic aims to undermine are highly intuitive, and their acceptance forms the basis for much of our practical, everyday knowledge, to the extent that revising them infringes directly on our entire world-view. Accept radical scepticism about the external world, for example, and all of our beliefs about entities external to ourselves, and the purpose of many of our philosophical endeavours, would have to be revised. Likewise, the committed sceptic about other minds does not function well in the ordinary world. But, if the classificatory sceptic is right, then there is, *ex hypothesi*, no problem with our ordinary practices of prediction, explanation and the means by which we get around the world, since we can use the structure our theory imposes on the world to do all that. The classificatory sceptic is no solipsist, relativist or idealist; the implications of her thesis are far less insidious from a common-sense perspective.

The urgency to dismiss radical scepticism arises because its conclusions fly in the face of common sense; scepticism about the external world or other minds, for example, cannot be taken seriously as philosophical positions but must play some other role in the debate. In such circumstances, it is not at all tendentious to dismiss radical scepticism by assumption, which is backed up by strong intuition; indeed the onus would be on those who wished to sustain the sceptical position to explain away the conflict between their view and common sense. However, Classificatory Scepticism does not share this radical character and is much more limited in scope, so there is not the same urgency to reject it. The only target of Classificatory Scepticism is a certain kind of metaphysical framework, which is facilitated by the acceptance of the Natural Properties Principle. Rather than launching a counterintuitive attack on vast tracts of knowledge, the classificatory sceptic

[72]One can, of course, still take local worries seriously that the taxonomy of a part of the theory is incorrect.

is simply urging a form of epistemic caution about adopting a controversial philosophical doctrine that nature has objective joints, which has itself been accepted as an unanalysable existential assumption.

Moreover, the assumptions with which radical scepticism is rejected, such as that nature has objective joints for instance, are far more highly intuitive, I think, than the assumption that we can know and say where these joints are. The former, the Natural Properties Principle, may not be a Moorean common-sense truth, but at least it has the promise of explaining a Moorean fact in its favour. On the other hand, when it comes to us knowing or saying where reality's joints are, there are intuitions on both sides. After all, it is uncontroversially accepted that different human languages vary to some extent in the ways in which they divide up the world, their vocabularies having evolved to account for local circumstances; what the classificatory sceptic does is present an argument which extends this thought about language. That the predicates of our scientific language refer to the objective joints in nature, I would suggest, is not an incontrovertible pre-philosophical or pre-scientific intuition.

Aside from the intuitive attraction of assumptions rejecting radical scepticism, which does not appear to be shared by Lewis's presupposition about our favoured epistemic position with respect to perfectly natural properties, the greater plausibility of the former also seems to depend upon their being very non-specific about the entity or entities which they postulate. For instance, Johnston argues that an anti-sceptical proclamation against those who deny that we can know that the world contains objects which persist over time should be as minimal in its metaphysical and empirical commitments as possible. In effect, we affirm our knowledge of the existence of a highly *determinable* process against the radical sceptic, in order that a substantive account of persistence can get off the ground.[73] The point is here that the more specific the presupposition, the more likely it is (intuitively speaking) that the presupposition in question will turn out to be false, and this may be difficult to ascertain once we are working within a philosophical system which requires its truth as a primitive background assumption, and therefore does not leave it open to question any more.

I think that Johnston's caution about how far we may safely extend our anti-sceptical stance is well-placed. The least contentious anti-sceptical assumptions are remarkable for their lack of informativeness: assuming, against the radical sceptic, that we know there is a mind-independent external world, or that others have minds, need not involve saying anything about these entities in any more than a minimal sense and, with Johnston, I would urge that they *ought* not to do so. In disarming the radical sceptic, we should

[73]1987, 134.

choose the assumption which embodies the least commitment to specific world-hypotheses, in order to constrain the range of available analyses as little as possible. The Natural Properties Principle is reasonably uncontentious in this sense, since it assumes there are qualitative joints in Nature, but does not mention what kind of things these joints are. In contrast, the assumption with which Lewis answers the classificatory sceptic goes much further in its commitments about the nature of natural properties, the nature of human thought, and the close relationship between the two.[74] I am inclined to think that Lewis thereby excludes from the debate much that might be worthy of philosophical or empirical enquiry.

Furthermore, the consequences of accepting the anti-sceptical assumption create internal conflict within the property realist's account. Firstly, the fact that the property realist must make a Lewisian assumption about natural properties being constitutive of the content of our thought, in order to bring his account of the causal ontology out of metaphysical isolation, creates tension with one of the original motivations behind *a posteriori* property realism that, as Armstrong says, the account should be 'based upon natural science' and inspired by our *actual* methods of knowing about the world and understanding it.[75] The causal ontology of sparse properties only has something to do with our scientific enquiries if we presuppose that empirical investigation can yield a theory which contains primitive predicates referring to perfectly natural properties (to a reasonably high degree of determinacy), but this substantial, unanalysable presupposition is surely at odds with good scientific practice. In accepting it, the property realist is in danger of poaching on empirical preserves, and his causal theory no longer sits comfortably with science but in opposition to it. Secondly, the view that our best theory of the world might turn out to be incorrect is widely accepted as a central tenet of the realist programme.[76] Smart suggests that 'it is coherent [for the metaphysical realist] to suppose that an ideal scientific theory which satisfied all possible operational and theoretical constraints could nevertheless be false'[77], but Lewis's assumption binds thought so tightly to the causal properties of the objective world that error in our scientific beliefs is in danger of becoming inexplicable. It is difficult both to see how mistakes could have been made so often throughout the history of science, and to make sense of the idea that our best theory might turn out to be incorrect, since if the natural properties of the world impact directly upon the content of our thoughts there seems to be no room for human conceptual apparatus to get things wrong.[78]

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[74]See 3.9.

[75]1978a, xiv.

[76]Although the realists who hold this do not wish to allow that our scientific theories may be incorrect to the extent that the classificatory sceptic suggests. See Smart (1982).

[77]1982, 3.

[78]This point is discussed by Baghramian (1998, 302) and C I Lewis (1929, 39).

The property realist's main support for the Natural Properties Principle is that it is an extremely useful presupposition for philosophers to accept. The classificatory sceptic questions whether, once we have accepted that nature has objective joints, we could ever say or know where those joints are. If the classificatory sceptic is correct, then the sparse properties of the world are unlikely to be the entities to which the primitive terms of our causal theories refer, which limits the explanatory utility of the Natural Properties Principle to theories considered in metaphysical isolation. In view of this, it seems to be a mistake to throw out Classificatory Scepticism with the same abandon with which we dismiss difficulties of a more radically sceptical variety, by means of another primitive assumption. Recall Swoyer's example of why inference to the best explanation might fail:

> [S]omething might explain one thing only to render other, previously unproblematic, phenomena an utter mystery (e.g., sets might explain mathematical truth only to make mathematical knowledge inexplicable).[79]

I suggest that Lewis's anti-sceptic solution is no remedy for Classificatory Scepticism and has the air of being entirely *ad hoc.* In response to an argument which says that, outside pure metaphysics, the grounds for accepting another presupposition, the Natural Properties Principle, by inference to the best explanation are very shaky (since the ontology of sparse natural properties can do no epistemological work), Lewis just assumes that the mechanism by which natural properties connect with our thought content and theories is *also* a primitive and unanalysable feature of the objective world. The general philosophical rule seems to be: if the basis for making an inference to the best explanation doesn't look like it will be forthcoming, just assume that it's already there. On what basis? Surely not also on the grounds of inference to best explanation?

I conclude that, unless one of the scientific realist projects sketched above is successful (or at least plausible),[80] the argument for Classificatory Scepticism stands and that its conclusion should be heeded. The upshot of this should be that, while the acceptance of the Natural Properties Principle may do some good in pure metaphysics, the implications of the mind-independent world being governed by a fundamental set of nomic connections relating perfectly natural properties should be kept in metaphysical isolation also, rather than being seen to conflict with what we or science ordinarily claim about the world.

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[79]1996, 249.
[80]See 3.8.

3.11 The Future of Natural Properties and Nomological Causation

As far as our world view is concerned, the causal ontology of sparse natural properties is akin to a theory of noumena, entirely isolated from our epistemic perspective: we have no idea whether our fundamental theory carves nature at its joints. Should this prompt philosophers to jump onto the scientific realist bandwagon and join in with the project to refute one of the premises of the sceptical argument? After all, my claim is not quite that the problem of Classificatory Scepticism cannot *in principle* be overcome, just that there is good reason for thinking that this is so. I worry, however, that the search for some mechanism whereby our the predicates of our theories link to objective joints of nature may be fruitless. In particular, if nature has no objective nomological structure – that is, if the Natural Properties Principle is false – then no amount of ingenuity on the part of the scientific realists will help their case. One cannot show that the Natural Properties Principle is false, of course, just as the property theorist cannot show it to be true; and, as long as both sides remain faithful to their respective intuitions on the matter, the philosophical stories we tell about the ontology of causation will be irrevocably divided into two opposing schools of thought.

Having considered this matter at some length, I must confess to suffering from vacillating intuitions about the truth of the Natural Properties Principle; nevertheless, I am inclined to be extremely suspicious of the utility of the objective causal ontology which the property theorist offers on the grounds of Classificatory Scepticism. There is reason enough, I think, to investigate other options, and I think there are two, the attraction of which depends upon where your intuitions lie: Either, we can accept the metaphysical account facilitated by presupposing the Natural Properties Principle, live with the fact of Classificatory Scepticism, and look for alternative ways to account for the way in which our scientific theories, and the terms within them, work. Or, we can keep much of our account of theoretical terms intact, by rejecting the Natural Properties Principle and the mind-independent causal ontology of sparse natural properties which presupposes it, which in turn gave rise to the problem of Classificatory Scepticism in the first place.[81] These would require a different account of causation from the one based on objective properties sketched in Chapter Two, and an alternative account of Moorean facts of sameness and difference and so, most probably, an alternative (elitist) account of properties also.[82] If this cannot be done then Lewis wins by default: his primitive presuppositions *are* indispensable to systematic philosophy.

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[81]See for example some time-slices of Putnam (1981) and van Fraassen (1997). One could hold this view and accept the metaphysical account facilitated by the Natural Properties Principle also, however (although I'm sure that Putnam and van Fraassen don't).

[82]See 5.13 for an attempt to formulate such an account.

I will postpone the investigation of an alternative account of causation until the next chapter, however, since many philosophers do not share my sceptical reservations about our epistemic access to the ontology of sparse natural properties and my pessimism about the success of the scientific realist project which could disarm the argument for Classificatory Scepticism. The nomological picture of causation linking sparse, perfectly natural properties, or variants upon this in which causes and effects are presumed to be complex entities partially constituted by instances of natural properties, is commonly accepted in the philosophical world and plays a central role – either implicitly or explicitly – in much discussion in the philosophy of mind.[83] For the remainder of this chapter I will examine how well nomological causation fares when applied to the explication of mental causation, and the relationship between the mind and the physical world.

3.12 Nomological Causation and the Mind

The nomological account of causation alone does not create difficulties for the explanation of mental causation: mental properties can cause and be caused by physical properties in virtue of their entering into nomic connections with them. The difficulties arise, however, when this account of causation is combined with certain other assumptions about the nature of the world, the most important of which is the *Completeness Thesis*.[84] According to this thesis, all physical effects are determined (or have their chances determined) by prior physical causes, the physical is causally and nomologically closed. If mental properties are excluded from the physical domain, then this thesis entails that all our physical behaviour is determined by prior physical properties, presumably those associated with the physical matter of our brains and central nervous systems, and perhaps also those of our environment. On the plausible assumption that causal overdetermination is not widespread – such that human physical actions are not caused by physical *and* mental properties simultaneously – then mental properties seem to have no causal role to play in the production of our behaviour.[85] But this result is in direction conflict with a common-sense intuition which I will call the *Principle of Causal Interaction*, that what we think causes what we do; or, in terms of the property theorist's nomological causation, that mental properties have a causal role to play in the production of behaviour. The intuitive force of this principle is passionately defended by Fodor:

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[83]See, for example, Papineau (1993), Lewis (1966 and *passim*), Kim (1993), Honderich (1988).
[84]The term is borrowed from Spurrett (1999), the formulation from Papineau (1993, 16).
[85]This assumption also played an important role in the rejection of properties on the abundant conception as being suitable for employment in the causal ontology, and the development of the theory of sparse properties (see 2.3).

> ...if it isn't literally true that my wanting is causally responsible for my reaching, and my itching is causally responsible for my scratching, and my believing is causally responsible for my saying, ...if none of that is literally true, then practically everything I believe about anything is false and it's the end of the world.[86]

But, if the Completeness Thesis is accepted and widespread overdetermination rejected, then this seems to entail the end of Fodor's world; the problem of mental causation has been generated.

If he refuses to embrace epiphenomenalism about the mental, the challenge that the property theorist faces is to explicate the relationship between mental and physical properties in such a way as to alleviate the conflict between these principles. If he unable to do this, then one of them will have to be rejected and it is not immediately apparent which one should go. The truth of this last remark is perhaps best attested to by the enormous volume of philosophical literature which the problem of mental causation has inspired, and it seems that, at one time or another in the recent debate, every available option has been proposed. I will not attempt to exhaustively examine the detailed proposals in the literature, therefore, since I think the viable options available to the property theorist are very limited.

The most promising option, I think, is the recent proposal[87] for a return to the materialist doctrine of identifying mental properties with physical ones, originally suggested by Place and Smart,[88] or the causal-role identity theory suggested by Armstrong and Lewis.[89] These are usually presented as distinct alternatives to each other, so it may seem peculiar to treat them as one; but, given the preceding discussion of the metaphysics of properties, I do not think there is any more than a verbal distinction between them. The latter causal-role identity theory is usually distinguished from the original type-identity theory on the grounds of its giving a causal-functional analysis of mental properties; that is, defining them in terms of their causal roles. The mental property of pain, for instance, just is the occupant of a certain causal role and the same goes for all other mental properties. If the discussion of the individuation of sparse properties in Chapter Two is correct however, this causal-functional analysis of properties is not peculiar to the mental realm. The most plausible characterisation of sparse properties is as essentially causal entities, constitutively identified by their causal or nomic role. So, for the materialists who maintain the type-identity of mental and physical properties, the properties of the mental realm had better be amenable to the causal-functional analysis suggested by Lewis and Armstrong, or Leibniz's Law of the Indiscernibility of Identicals will be broken. Whereas, if the analysis of physical properties had not shown them to be

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[86]1989, 77.
[87]See Kim (1998).
[88]Smart (1959), Place (1969).
[89] Armstrong (1968); Lewis (1966; 1980).

essentially causal entities, then the identities suggested by Armstrong and Lewis would be in trouble.[90] The type identity theory of Smart and Place and the causal-role identity theory collapse into each other on this account of the causal ontology. Since the causal-functional analysis of properties is common to both mental and physical properties, I will drop talk of 'causal-role identity theory' in favour of plain 'Type Identity'.

3.13 Supervenience and other Dependency Relations

I will move on to evaluate the Type Identity account of the relationship between the mental and the physical presently, but it may not yet be obvious that this is the only option available to the property theorist to solve the problem of mental causation, if they do not wish to reject one of the principles which generated it. After all, many attempts have been made to forge a weaker relation than Type Identity between mental and physical properties since Type Identity, its detractors claim, is far too strong.[91] These suggest that mental properties are related to physical properties by some atemporal determination relation analogous to causation: mental properties are supervenient upon physical properties,[92] or the former are determined, or realised by the latter.[93] The intuitions underlying these variations are that there is no mental change without physical change, and that if two individuals are indiscernible in physical respects then they will be indiscernible in mental respects. Like causal-nomic connections, these atemporal determination relations are assumed to have some modal force such that they support counterfactual and subjunctive expressions: If the serotonin levels in my brain hadn't been high, I would not have been euphoric (for instance).[94] The determination of the mental by the physical is governed by a species of 'physical' or nomological necessity, of the same strength as that which governs causal nomic connections between physical properties. This characterisation of the relationship between the mental and the physical is, its supporters claim[95], able to solve the problem of mental causation within a minimally physicalist framework.

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[90]This is discussed by MacDonald (1989, 49 - 60). Since her discussion is not prefaced by a lengthy examination of the metaphysics of properties, she treats causal-role identity theory as distinct from the type identity of the central state materialists and recognises more options than I do. She does, however, reach the same conclusion.

[91]Objections to Type Identity are raised in 3.14.

[92]Kim (1993), Papineau (1990; 1991).

[93]Papineau (1993).

[94]I will omit the exact details of different formulations of supervenience here, since they are not pertinent to the debate at hand. See Kim (1993, ch. 5 and *passim*). I will take Kim's strong psychophysical supervenience as a paradigmatic such that: *Necessarily*, for any individual x and mental property M, if x has M then there exists a physical property P such that x has P, and *necessarily*, if any individual y has P then it has M. (1993, 80). I will also leave open the question of the breadth of the supervenience base; that is, whether the mental properties of an individual are dependent upon the relations that individual bears to the environment in addition to their intrinsic physical properties.

[95]Or, in the case of Kim, 'claimed', since his views have now changed. See Kim (1998).

The main problem for supervenience theorists, however, is that their formulation of the relation between the mental and the physical still does not seem to leave any room for mental properties to be causally efficacious in the way that the Principle of Causal Interaction requires. The mental properties of an individual cause action only in virtue of their supervening upon physical properties which stand in causal relations to each other. This notion has been termed 'supervenient causation', such that, in general: M superveniently causes M* iff M supervenes on P and M* supervenes on P* and P causes P*.[96] The difficulty is, if we retain the ban on prevalent causal overdetermination, that the physical causes seem to be doing the real causal work, rather than the mental properties which supervene upon them. Moreover, as Crane points out, accepting that mental properties can superveniently cause each other denies a background assumption implicit in our intuitive affirmation of the Principle of Causal Interaction. He calls this the *Homogeneity of Causation*; namely, that when mental properties enter into causal relations -- either with other mental properties, or with physical properties – they do so in exactly the same manner as causation occurs between physical properties alone.[97] The word 'cause' is not multiply ambiguous according to the family of properties to which its relata belong, or, at least, that seems to be a plausible intuition.[98] The supervenience theorists appear to be vacillating between outright epiphenomenalism about mental properties and the denial of the Homogeneity of Causation which is implicit in our acceptance of the Principle of Causal Interaction.

Even if we ignore the problem of mental causation, supervenience also presents difficulties for the explication of the relationship between the mental and the physical. As Kim points out, in his early work, the formulation of strong supervenience entails the existence of necessary co-extensions between mental and physical properties, co-extensions which look suspiciously like bridge laws of the type which would enable the reduction of mental properties to physical ones.[99] Within the objective ontology of sparse properties, the conception of reduction in play is that of *ontological* reduction, rather than reduction being regarded as some theoretical device according to which our theories may be made neater and explanation more perspicuous; the reduction of one family of properties to another really does amount to saying that only the latter entities exist as *bona fide* natural properties.[100] Once reduced, the properties of the reduced science are effectively identified with those of the reducing science. For instance, in the paradigmatic case of the reduction of thermodynamics to statistical mechanics, the relationship between temperature and the mean kinetic energy of molecules is one of type identity; ontologically speaking, a body's

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[96]See Kim (1984a, 106).
[97]1995, 229.
[98]This intuition also motivated the initial investigation into the nature of causal relata in 1.2.2.
[99]Kim (1978; 1984b). Also, see Kim (1990, 151 - 2) for a revised version of this derivation.
[100]The distinction between theoretical and ontological conceptions of reduction is taken from Fodor (1974).

having a certain temperature really is just its constituent particles having a certain mean kinetic energy.[101] When ontological reduction is the order of the day, there is, as Kim suggests, a fine line separating reductionism about a class of entities and eliminitivism which may turn out to be a distinction in name only.[102]

Whether the necessary psycho-physical co-extensions entailed by supervenience are a suitable reductive device is a contentious issue, however, with many philosophers claiming to find *a priori* reasons that mental properties are irreducible to physical ones. These are either grounded in disanalogies between the form of the necessary co-extensions entailed by supervenience and reductive bridge principles,[103] or upon essential differences between the mental and physical properties which the co-extensions relate.[104] However, the success of arguments for the irreducibility of mental properties to physical ones, despite the former supervening on the latter, brings with it a harder problem for the theorists for whom supervenience is central to the characterisation of the relationship between the mental and the physical. The nature of the asymmetric determination of the mental by the physical can no longer be treated as an atemporal relation analogous to the causal determination which obtains between sparse physical properties. This determination promised to be hard enough to characterise when the analogy with causation held, but the combination of supervenience and irreducibility requires an explanation of how can physical properties determine or realise properties with which they are essentially dissimilar, phenomenal properties (for instance). Both the origin of conscious minds, and their continued dependency upon the physical properties of the world become inherently mysterious. While the non-reductive supervenience theorist lacks a suitable account of the nature of this determination relation, his account of the relationship between the mind and the physical world is compatible with some forms of dualism; in particular with Leibnizian parallelism which insists that the mental and physical are distinct substances, the properties of which co-vary in pre-established harmony.[105]

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[101]The example is from Ernest Nagel (1961, ch. 10), whose concern was the theoretical conception of reduction, rather than that of the ontological variety. The present conclusions apply only to the latter.

[102]1993, 360.

[103]For instance, to allow for the variable realisability of the mental by the physical, the physical base properties upon which mental properties supervene may be highly disjunctive; they may, indeed, be infinite disjunctions. This would present insurmountable epistemological difficulties concerning the confirmation of such bridge laws (see Seager (1991)), but its implications for the ontological status of mental properties is not clear. Anti-reductionist arguments stemming from Fodor (1974) conclude that reduction is disbarred since highly disjunctive properties are not, in the terms of this thesis, natural enough for mental properties to be reduced to (see Teller (1984); Charles (1992)). However, Kim has objected that these disjunctions are natural to the same degree as the mental properties with which they co-vary, and this strategy will not help to preserve the causal efficacy of mental properties.

[104]This issue arises again in the discussion of Type Identity in 3.14.

[105]See, for example, 1695 - 6, 122 - 3.

It seems, therefore, that the introduction of a relation between mental and physical properties which is weaker than identity does not help the property theorist's account accommodate mental causation, nor does it help with his explication of the relationship between the two domains. The property theorist is faced with a choice between accepting the causal inefficacy of mental properties, or maintaining that mental properties are type-identical with physical properties.

3.14 Type Identity (Again)

The physicalist property theorist can only maintain the view that mental properties have anything, ontologically speaking, to do with the causation of our physical behaviour if he accepts that mental properties just are physical entities; by giving a mental and a physical causal explanation of an action we are citing the same cause in different vocabulary. The mental has no causal autonomy with respect to the physical, and the causation of action is as deterministic as physical causation (however deterministic that is); the behaviour of human beings is not free from the physical nomological net.

The property theorist may be able to defend the *explanatory* autonomy of our psychological theories, however, for pragmatic reasons. The mentalistic causal explanation that I stretched out my arm because I wanted to reach my coffee is far simpler than one which cites a complex causal history in neurophysiological terms, or the one in terms of fundamental physical properties which is available in principle. Moreover, once we begin to make interpersonal generalisations about behaviour, and perhaps even inter-species ones, the complexity of the physical explanation will greatly increase. However, this preference for psychological explanations can only be a pragmatic consideration for the sparse property theorist, since the simplicity in play here must be distinct from the objective simplicity – simplicity-with-respect-to-perfectly-natural-properties – which was used to ground the notion of property naturalness.[106] If mental property M is identical with physical property P, then M and P must have the same degree of naturalness and objective simplicity; objectively speaking, they are equally as simple since 'they' are one. So the fact that we find an explanans simpler in mental terms, than in terms which pick out the objective physical structure of the world, must be due to something about us and our human starting point for the investigation of the world we live in. If the property theorist wishes to defend the greater intelligibility or simplicity of explanations in terms of mental predicates, and thus weaken the blow of this return to the strong thesis of type identity between mental and physical causes, he must admit that the objective simplicity of the world is not always simplicity for us.

[106]See 2.8.

The cost of preserving the explanatory autonomy of mental properties in this way for the sparse property theorist, however, is that it amounts to conceding that the worries which fuelled the classificatory sceptic's argument were well-founded. How much of our theorising is governed by pragmatic considerations which have nothing to do with the objective structure of the world, rather than the pull of the objective simplicity of perfectly natural properties? The greater the force of pragmatic considerations, the more likely it seems that our fundamental theory will not carve nature at its joints, but at whichever points are explanatorily useful for us and seem the most simple. If we cannot distinguish between these conflicting constraints, the epistemological difficulties concerning our knowledge of perfectly natural properties would seem to be reinforced.

Moreover, there is tension here between the pragmatic conception of simplicity required to preserve the explanatory autonomy of the mental (and perhaps all other 'higher-level' explanations not framed in terms of predicates referring to perfectly natural properties), and the anti-sceptical response to Classificatory Scepticism. The latter assumes that we have epistemic access to progressively more natural (and ultimately perfectly natural) properties because a property is objectively more eligible to be the referent of a predicate, or constitutive of the content of our thought, the more objectively natural it is. But the former asserts that the world is sometimes more intelligible to us in terms which refer to *less* natural properties. Unless the anti-sceptical property theorist can cash out the 'sometimes', and delineate when pragmatic constraints are trumped by objective eligibility or property naturalness, and vice versa, he cannot maintain both these claims. Thus, taking an anti-sceptical stance to the Classificatory Sceptic makes it harder to defend the explanatory importance of mental properties and our intuitions that higher level psychological explanations of behaviour are so much easier to understand than those involving fundamental physical properties.

Of course, the Type Identity theorist does not have to defend that claim, but then he would be bound to explain away the intuition that a psychological generalisation about behaviour in terms of belief and desire seems simpler and more homogeneous than one which picks out the neurophysiological (and other physical) properties with which each instance of the belief and the desire is identical, when, objectively considered, the properties are as simple as each other. But, if this can be done, there seems no reason to countenance the extra vocabulary of the mental in our explanatory discourse: eliminative materialism beckons, since our causal stories about the mind are as intelligible when told in purely physical terms. Not many physicalists are prepared to endorse this account, however[107]; most would prefer a weaker version of physicalism as an ontological thesis,

[107]Those who do endorse it include Stich (1983), P M Churchland (1981; 1984) and P S Churchland (1986), although in contrast to their views, the Type Identity theory under discussion does not entail that Folk Psychology is false, just that it is superfluous.

rather than one which asserts the primacy of physics in all our causal explanatory endeavours to the exclusion of all other vocabulary.

Moreover, in addition to this difficulty of maintaining any explanatory place for mental properties, the Type Identity thesis is also subject to another set of well known objections against identifying mental and physical types, which focus upon essential differences between mental and physical entities. The causal-functional analysis of the mental required by this account leaves out essential features of some species of mental properties, it is argued.[108] For instance, phenomenal properties or qualia have an irreducible intrinsic, qualitative aspect which causally identified properties might lack and which could not be brought out in a functional analysis of the mind. The metaphysical possibility of the existence of zombies – beings which are functionally equivalent to conscious human subjects, but which lack phenomenal experience, or a conscious point of view – seems intuitively plausible. The causal-functional analysis of mental properties does not appear to exhaust their analysis – conscious properties are intrinsically qualitative while physical properties are not – and so, it seems, that the Type Identity theory must be false. The Type Identity theorist is bound to defend his theory against these objections which maintain that *only* mental properties have this intrinsic nature essentially or, once again, Leibniz's Law of the Indiscernibility of Identicals would be broken. On the one hand, he could do so by denying that mental properties have a distinct phenomenal feel, or that we can have a coherent conception of qualia[109]; on the other, he could slide towards panpsychism and admit qualia into the physical ontology, maintaining that there are properties in the physical realm with intrinsic phenomenal feel.[110] The former option defends the traditional materialist or physicalist motivation behind Type Identity; the latter presents a new and rather surprising conception of the physicalist ontology which might be difficult to comprehend, since having qualia may no longer be the exclusive preserve of the animate, but of inanimate matter as well.[111]

3.15 Alternatives to Type Identity

If Type Identity is the only plausible account of the relationship between mental and physical properties and it yields such a strong physicalist thesis (or an odd and

[108]There are a large number of objections of this variety to Type Identity and/or the causal-functional analysis of the mental. See, for instance, Block (1980b), Nagel (1974), Jackson (1982; 1986), McGinn (1995), Chalmers (1995).

[109]This strategy is adopted by Papineau (1993), Dennett (1988; 1996), P S Churchland (1996), Clark (1996), Lycan (1987), Hardcastle (1996) and others.

[110]This strategy is most famously proposed by Chalmers (1995), but a similar suggestion appears in early work by Russell (1914, 1915).

[111]Despite its intuitive oddness, this solution is less so given that the best characterisation of physical properties is an extrinsic one, in terms of the nomic or causal relations they bear to other properties (see 2.5 - 2.9). Thus, the idea that these properties may also involve an intrinsic qualitative 'feel' or nature is compatible with account of physical properties under discussion.

speculative panpsychic one), there may be reason for the property theorist to give up one of the conflicting assumptions which made it seem attractive in the first place. Some are prepared to give up on the Completeness Thesis, or the exclusion of the mental from the physical realm, in favour of a more encompassing functionalist naturalism which includes mental properties as causes alongside physical ones and does not try to characterise the synchronic relations between the mental and the physical. This has the advantage that the apparent simplicity of our folk psychological explanations in comparison with our attempts at explaining thought in neurophysiological, or more fundamental physical, terms can be reconciled with the natural order. Mental properties may be highly natural, and therefore objectively simple, and the same need not be said of attempted redescriptions of these properties in physical terms. Once mental and physical properties are not regarded as identical, our intuitions that an explanation of behaviour in psychological terms is simpler than that in terms of fundamental physics do not conflict with what Leibniz's law tells us about their equal objective simplicity; and the denial of the causal closure of the physical resolves difficulties about the causal and explanatory efficacy of the mental.[112] On the other hand, as a version of functionalism, this it still susceptible to the objections that causal-functional analysis does not exhaust the analysis of the mental. However, the denial of physicalism permits the inclusion of free-standing phenomenal properties to enter the causal picture, should these objections be taken seriously. This may make it very difficult to explain how physical and phenomenal properties enter into causal relations, but does not sustain the ontological problem that the causal ontology leaves something out which is essential to mentality.

This proposal to permit mental properties into the causal order, and deny the causal closure of physics, does not sit happily with one of the original desiderata of a theory of causation which motivated the objective causal ontology of sparse properties. This sought to characterise the ontology of an objective, mind-independent relation of causation, such that its being 'instantiated does not entail anything about the existence or non-existence of any intentional psychological states – in particular, an epistemological or doxastic state – except, of course, when it is instantiated by such states.'[113] To do this, while preventing prevalent overdetermination and maintaining the notion of discontinuous change, the most plausible ontology of properties is a sparse one.[114] But this naturalistic ontology is far from sparse and so, as its proponents happily admit, the present proposal introduces a different conception of causation as an explanatory concept.[115] The suggestion is, as Baker puts it:

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[112]See Crane (1995).
[113]Kim (1988).
[114]See 2.3.
[115]Some causal theorists take this conception of causation as their starting point. See Owens (1992), for instance.

> to take as our philosophical starting point, not a metaphysical doctrine about the nature of causation or of reality, but a range of explanations that have been found worthy of acceptance... to begin with explanations that earn their keep, rather than with the metaphysics, which seems to me a freeloader that interferes with the real work.[116]

The theme of taking explanatory practice as a guide, and disavowing interest in the nature of synchronic relations between mental and physical properties is echoed by Burge:

> One cannot understand mentalistic causation (causation involving mentalistic or intentional properties) and mental causal powers by concentrating on properties characterised in the physical sciences. Our understanding of mental causation derives primarily from our understanding of mentalistic explanation, independently of our knowledge – or, better, despite our ignorance – of the underlying processes.[117]

This approach has advantages over sparse property theory and the realist conception of causation relating such properties in that it does not require the presuppositions which were needed in order to support the metaphysics of sparse properties and our epistemic access to them and so its supporters can afford to be agnostic about the truth of the Natural Properties Principle. If explanatory practice is the key to causation then it doesn't matter whether nature has joints, nor whether our theories carve nature at those joints; even if they happen to do so, they will carve nature many other ways as well, depending upon our explanatory interests. The strong realist approach of the sparse property theorist which maintained that all the causation in the world takes place in virtue of a few fundamental, perfectly natural properties has been replaced by a less ontologically committed 'promiscuous realism'.[118] Since the classificatory sceptic is happy to allow that many of the properties which we recognise are more-or-less natural, it would not fall victim to the argument for Classificatory Scepticism; despite the 'realist' tag, causally efficacious properties are now treated as explanatory postulates, which are not necessarily entities which exist in virtue of the objective causal structure of the world.

3.16 Conclusions about Natural Properties, Causation and the Mind

This chapter has tracked the fortunes of sparse property theory, both as an account of the ontology of causation and when it is adopted as an ontology of mind, and thereby attempted to test the explanatory utility of accepting the Natural Properties Principle as a primitive ontological assumption. The argument for Classificatory Scepticism examined

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[116]1993, 92 - 3.

[117]1993, 103. Depending on the nature of these 'underlying processes' Burge may have to give up on the ban on causal overdetermination (since this position is agnostic about the truth of the Completeness Thesis). But, given the explanatory conception of causation in play, I suspect he would be happy with this.

[118]The term is Dupré's (1993).

our epistemic position with respect to the sparse causal ontology which the Natural Properties Principle assumes and found that our claim to have knowledge about which perfectly (or highly) natural properties there are is questionable. I suggested that it is a mistake to merely ignore the sceptic here and make a further assumption about our favourable epistemic position with respect to objective sparse properties, since Classificatory Scepticism is disanalogous to radical scepticism. The acceptance of Classificatory Scepticism does not have the counterintuitive implications which make radical scepticism impossible to take seriously and is rather a form of epistemic caution about whether our scientific endeavours could ever lead us to discover the ultimate objective qualitative divisions of the world. The on-going scientific realist project which attempts to tie the terms of our theories to sparse, causal properties may yet disarm the classificatory sceptic's argument, but it is uncertain whether this project will succeed without circularity, or initiating a regress of assumptions which are accepted by inference to the best explanation.

Although I think these sceptical problems counsel against the adoption of sparse properties as the ontology of causation, the discussion then turned to the application of this account to the explanation of the mind. The physicalist claim that the physical is causally closed, and thus that all perfectly natural properties are physical, brings with it the problem of mental causation (when prevalent causal overdetermination is rejected and causation conceived as a homogeneous mind-independent relation). I suggested that property theorists who want to maintain the causal efficacy of mental properties have no option but to accept the Type Identity of mental and physical properties. However, they may then run into problems defending the explanatory importance of mental properties, especially because this is often grounded in the greater intuitive simplicity of psychological explanations compared to explanations of the same effects in fundamental physical terms. If the Type Identity theory is true, this pragmatic conception of the simplicity of an explanation conflicts with the objective conception of simplicity which the property theorist has invoked as a measure of property naturalness. This reinforces the classificatory sceptic's position and may contradict the anti-sceptical epistemological assumption about the naturalness of thought content which has been invoked against it.

The version of Type Identity theory on offer is therefore very strong, since the property theorist may find it hard to maintain the explanatory relevance of the mental against outright eliminitivism about mentalistic explanation once he admits that mental properties are identical with physical ones. There are also objections to the strength of Type Identity on the ground that the causal-functional analysis of the mental leaves out an essential feature of mentality. The Type Identity theorist might find responses to these objections but, if he cannot, it seems that one or more of the other principles which generated the problem of mental causation must be rejected. Identity of mental and

physical properties could be rejected, and the mental treated as causally epiphenomenal; or the causal efficacy of the mental could be preserved and either the Completeness Thesis or the ban on overdetermination of the mental by the physical rejected. This nominally realist account begins to diverge from the theory of objective sparse causal properties, however, since it no longer seeks to characterise causation as a homogeneous, mind-independent relation but as an explanatory concept, nor does it require the Natural Properties Principle to be presupposed.

It seems that the sparse property theorist can fit the mind into his causal ontology only by accepting a very strong version of reductionist physicalism in which mental predicates could in principle be eliminated from our vocabulary. Alternatively, he can maintain some causal autonomy for the mind by breaking with the physicalist tendencies which motivated the account of sparse properties in the first place. In particular, this engenders a change in the conception of causation in play; such accounts do not characterise causation as a mind-independent phenomenon. For those who favour the sparse property theory discussed in this chapter and the last, however, this change in the conception of causation may be regarded as changing the subject; the realist suspicion persists that there is something more to causation, that there are objective processes occurring in the world independently of there being any sentient beings to predict and explain them.

I share this suspicion, but I do not think that sparse property theory has provided a very convincing account of mind-independent causation; to my mind it requires taking too much unanalysable metaphysical speculation on board, and it also appears to seriously constrain what we are able to say about the nature of mind. I think, therefore, it is time to look to an alternative account of causation and explanation to see if it can do better. The next two chapters will consider the plausibility of a realist account of causation holding between events.

CHAPTER FOUR

EVENTS AND OBJECTS AS CAUSES AND EFFECTS

4.1 Intuitions in Favour of Concrete Particulars

The view that causes and effects are concrete particulars has some dedicated and long-standing philosophical support. In ordinary language too, singular causal statements frequently appear to report causal relations holding between events or objects: both 'The knife caused the wound' and 'The stabbing caused the bleeding' may serve as a true report of a certain incident of singular causation. David Hume, the honorary grandfather of much modern theorising about causation, defined causes in terms of objects, such that a cause is 'an object precedant and contiguous to another, and where all the objects resembling the former are plac'd in like relations... to those objects that resemble the latter'.[1] More recently, Davidson has argued extensively that causes and effects are particular events[2], and in the literature on causation and mental causation, it is often unreflectively assumed that such entities are the relata of singular causation.[3]

However, the initial case in favour of concrete particulars being the sole category of entities acting as the relata of singular causation is not nearly so strong as that which favours abstract particulars as causes and effects.[4] Accommodating such a claim within a workable metaphysical picture requires far more explication of the relationship between instances of singular causation and causal explanation: unlike abstract particulars, which may readily be regarded as the relata *both* of singular causal instances and of instances of the causal laws in which we frame at least some causal explanations, the ontology of concrete particulars is too coarse-grained to permit a similar strategy.[5] In virtue of the very feature by which concrete particulars are distinguished from abstract particulars – namely, their potential to exist independently of any other individual member of that category (and, if these entities are ontologically primitive, independently of the existence of individuals of any other category either) – each particular event or object and causal sequences which obtain between them may be qualitatively unique, making these entities strictly unrepeatable entities that are not essentially tokens of some type or kind (over and above the ontological category to which they belong). If this is the case, then singular

[1]1748, 170. However, Hume's definitions are often equally well interpreted as concerning events.
[2]1967a and *passim*.
[3]See, for instance, Brand, ed. (1976, Introduction). Also, the acceptance of token physicalism in the philosophy of mind requires at least implicit assent to an account of causation in which causes and effects are concrete particulars. See Steward (1997, 28 - 40).
[4]See 2.1.
[5]See 2.6.

causation bears no obvious relationship to generalised causal explanation and, although that may be due to there being *no* such relationship as a singularist characterisation of causation would maintain, the singularists must at least face up to the challenge of explaining away the appearance of a connection between singular causal instances and generality, in order to give some credence to their view that so many of their eminent philosophical forbears were hopelessly mistaken.

In addition to accounting for this *prima facie* problem, the category of concrete particulars must also be individuable from other ontological categories without reference to any qualitative features that particular objects and events may have, in order to be considered as superior candidates to abstract particulars, and structured complex entities partially constituted by them, discussed in the previous two chapters. If this cannot be done, concrete particulars will inherit the difficulties encountered with the individuation of abstract particulars and, since the latter category of entities is far more suited to making the relationship between causation and explanation manifest, concrete particulars will be on the whole less suitable than them as candidates for singular causal relata.

4.2 Events and Objects

I shall move on to the issue of identity and individuation criteria shortly, but at this stage in the discussion, it is not yet clear whether I am entitled to consider the suitability of objects and D-events together, or if an additional issue, concerning some kind of ontological or causal priority of one of these categories of entities over the other, must be addressed. Until now, the claim that there is no additional issue has been accepted as an implicit assumption, but folk ontology clearly distinguishes between objects and events, so some justification for permitting this assumption is in order.

As far as their causal interest goes, there are good reasons, arising from very diverse philosophical standpoints, to maintain that, if singular causal relations obtain between concrete particulars at all, they hold between D-events, rather than objects. Firstly, one may support this claim on the grounds that all singular causal statements apparently relating terms referring to objects are *elliptical* for more complex causal claims: *either* that the object behaved in a certain way, *or* that it instantiated a certain property.[6] Such object-relating singular causal statements are comparatively rare, especially those where the term in the effect position picks out an object; in such cases, as Steward notes, it is usually the *creation* of the object, rather than the object itself, which is taken to be caused.[7] As causes too, objects appear to be less plausible candidates than other entities. The singular causal statement that 'The knife caused the wound' implies that the knife was cutting or

[6]See, for example, Honderich (1988, 16) who opts for the second horn of this dilemma.
[7]1997, 142.

stabbing at the time, or that it was sharp: the knife appears to require more than just its presence or existence as a particular object to be a cause. If this is the case, then objects are only to be regarded as causes either in virtue of their presence in the same region of space-time as that in which some particular event is occurring, *or* by their having a certain structure, which at least includes their having *some* individual property. Both of these options suggest that objects do *not* act as primary causal relata: the former because the particular event – the knife's cutting, or a stabbing with the knife – appears to take causal precedence over the knife, *qua* object, as a cause; and the latter because there is something about the knife, some individual property that it has – its sharpness, say – which is either required for the knife to be the cause, or indeed *is* the cause (the knife being left out of the causal picture completely). These latter suggestions, which respectively involve complex entities and abstract particulars as causes, have already been considered in the Chapters Two and Three. So, if the argument from ellipsis is granted some sway, there seems to be a strong case to maintain that events are more plausibly counted as causes than objects.

However, the difficulty with maintaining that certain segments or structures of language are elliptical is that the plausibility of the argument relies on our intuitions about the 'real meaning' of statements in ordinary language, a supposition that what we actually say is sometimes, in its surface form, inherently incomplete. Although this is undoubtedly the case, and frequently so, the weakness of this type of argument is that it may as efficiently be invoked to support a conflicting conclusion. The determined supporter of objects as primary causal relata could as easily maintain that singular causal statements relating events or property-instances elliptically report a relation connecting objects: the argument from ellipsis is inconclusive either way around.

A second, less tenuous way in which the question of the relative causal importance of objects and events could be settled arises from more substantial ontological claims that events take ontological precedence over objects, or vice versa.[8] On certain identity conditions, those based on sameness of spatio-temporal location for instance, either ontological category could provide a complete taxonomy of space-time – 'complete' in the sense of not leaving any region of space-time uncovered, definitely *not* in the sense of being conceptually complete for the purposes of theorising – and thus, it might be the case that one category is conceptually dependent upon, or ontologically prior to the

[8]As in the discussion of abstract particulars and structured complexes (2.1), this is not to suggest that one category of entities being ontologically more fundamental than another entails that the former are causally more important than the latter. One could maintain that individual causes and effects are states of affairs rather than property-instances (say), although the former entities are partially constituted by properties or property-instances and hence ultimately dependent upon them for their existence. However, questions concerning the ontological dependence of one category upon another are relevant insofar as the plausibility of a derived (or wholly dependent) category of entities is ultimately parasitic upon the plausibility of the more fundamental ontology.

other.[9] The problem which then arises is to figure out and justify in which direction the dependency runs, and this is a debate which rapidly results in stalemate.

This stalemate might be the product of inadequate or ineffectual theorising on the part of one side or the other. But, equally, the limitations of arguments that focus purely upon fundamental ontology leave it open for each faction to remain steadfastly unconvinced by the arguments of the opposition. Perhaps the failure to reach any settlement or compromise on this issue recommends a third alternative: that the distinction between D-events and objects is a grammatical or merely taxonomic one, rather than a distinction which is grounded in reality. This view would gain additional support should it transpire that objects and events are constitutively identified and individuated by the same criteria, such as spatio-temporal location, and thus that it makes no sense to enquire whether a particular region of space-time and its contents thus individuated is really an object or an event. This is not an epistemological point but a constitutive one; that is, that *there is nothing* by which individual D-events and objects are distinguishable, however perfect our epistemic abilities and situation.

However, this third option might initially be resisted on the grounds that there are essential differences between those particulars which are objects and those which are D-events that have yet to be discussed: firstly, that objects and events can be distinguished from each other on the basis of their essential qualities of persistence[10] and change, respectively[11]; or secondly, because events have temporal parts while objects do not, and thus that the manner of their persistence through time is essentially dissimilar.[12]

The first suggestion rules out the possibility that either category alone could provide a complete taxonomy of space-time, and thus of all concrete particulars, which allows the question of ontological priority (or equality) to arise, by preventing 'unchanges' (regions of space-time in which nothing is happening) from being counted as events. This additional criterion seems intuitively plausible, but a little further investigation suggests that persistence and change provide no more than a rough guide to distinguishing between objects and events. In the first instance, it is not obvious that all and only particular events essentially involve change, as Ducasse points out.[13] Actual world

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[9]Strawson, for example, argues that objects are ontologically prior to events; that is, events are conceptually dependent on the existence of objects but a similar conceptual dependence does not run the other way (1959).

[10]For convenience, I will adopt the terminology standardised by Lewis: '...something *persists* iff, somehow, it exists at various times; this is the neutral word. Something *perdures* iff it persists by having different temporal stages at different times... it *endures* iff it persists by being wholly present at more than one time' (1986a, 202).

[11]See, for example, Lombard, who defines events as changes (1986, chs. 4, 5, 6 and *passim*).

[12]Mellor (1981, chs. 7, 8).

[13]1926, 126. This point is also used as an objection by Steward to reject Lombard's characterisation of events as changes (1997, 69-72).

examples are difficult to come by, but one might conjure up counterfactual situations in which periods of time elapse and yet no change whatsoever occurs throughout certain spatio-temporal regions, although we would still be intuitively inclined to call such occurrences events. For example, consider Shoemaker's example of a possible world divided into three regions A, B and C, each of which are subject to periodic 'local freezes', such that nothing occurs in that region for a certain duration, although life in the others continues as normal. Despite the complete lack of change in a region during such a local freeze, we may still be inclined to class such local freezes as events although everything within the region endures throughout the freeze.[14] Moreover, even those with conflicting intuitions who refuse to class any unchanging particulars as events would most probably wish to consider some of these entities as causes or effects. In the context of the discussion of causation, the proposed distinction between objects and events in which the latter are essentially characterised as changes does little to restrict the species of entity which count as causes and effects.

In addition to such counterexamples which suggest that the proposed distinction between particular objects and events on the basis of persistence and change is counterintuitive, the proposal also founders if, as appears to be the case, persistence is a feature which cannot be conceptually characterised except against a background of change, nor change except against a background of persistence. The notion of change, it is suggested, is inconceivable without the notion of something enduring through that change, while the endurance of an entity is defined immediately in terms of that entity's not changing over time. This creates a symmetrical inter-dependence between the categories of objects and D-events; neither category is dispensable nor derived from the other. In such a situation the status of object-hood or event-hood is a matter of degree and the distinction between these categories ontologically insignificant, dependent on our conceptual and linguistic habits rather than on the existence of anything by which to individuate one category of entities from the other. This view of the ontological equality of the categories of objects and events, as opposed to the ontological priority, or conceptual dependence, of one category over the other, is echoed by Davidson: although 'the concept of an event depends in every case on the idea of a change in a substance'[15], there is a symmetrical conceptual dependence of objects on events such that 'neither the category of substance nor the category of change is conceivable apart from the other'.[16]

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[14]1969, 68-69. It is worth noting here that acceptance of this as an example of an event involving no change does not require the acceptance of the central thesis in Shoemaker's paper that there can be time without any change occurring anywhere (that is, of the conceptual possibility of freeze occurring in all three regions of his possible world at once).

[15]1969, 174.

[16]1969, 175. Davidson does not make the claim that the difference between the ontological categories is merely a grammatical one until later (1985, 175-6) where he rejects his earlier view that events and things have different constitutive criteria of identity and individuation, causal role and spatio-temporal location respectively, in favour of them sharing the latter. Had they different criteria, this would give some

The second proposal to distinguish the category of objects from that of events – that particular events have temporal parts while objects do not – also runs into difficulties. Supporters of this criterion maintain that particular objects persist through time by *enduring*; that is, they are extended in time[17] *and* are *wholly present* at all times of their existence. In contrast to this, particular events *perdure*, they have different temporal stages at different times, and the manner in which they persist through time is analogous to the way that a road persists through space where 'part of it is here and part of it is there, and no part is wholly present at two different places.'[18] However, as Lewis argues, this contrast cannot be maintained, since, he claims, the phenomenon of endurance is inconsistent with the uncontroversial phenomenon of intrinsic change in objects, such as change in shape. If we say that a particular object is wholly present at two different times, and yet is straight at one time and bent at another (say), then it seems that we have a contradiction: the very same concrete particular is both straight and not straight. The only viable solution, Lewis concludes, is to treat the different shapes as belonging to different things and accept that particular objects perdure, rather than endure.[19] If this is the case, then objects and events both persist by perduring; there is no distinction to be found between objects and events on the basis that the latter have temporal stages, while the former do not.[20] Lewis's extreme conclusion that objects perdure rather than endure has been

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substance to the question of whether a region of space-time was an event or a thing and there would be more than a grammatical difference between them; without this difference, however, the question no longer seems to make sense.

[17]See Mellor (1995, 124). He recognises that this necessary condition that objects are temporally extended precludes treating instantaneous particulars (certain species of sub-atomic particles, perhaps) as objects, rather than events.

[18]The contrast is Lewis's (1986, 202).

[19]Lewis rejects two other solutions as 'incredible': firstly, that shapes (and other intrinsic properties) are disguised relations which an enduring thing bears to times; secondly, that persistence be rejected altogether by saying that there are no other times, and hence that the only intrinsic properties that a thing has are those it has at this moment (1986, 204).

[20]Some terminological caution is advisable here, since there are *two* conceptions of temporal parts in play, which might raise worries about whether the success of this argument relies on their being conflated. As Lewis notes (1983a, 77), by 'part' he just means 'subdivision', but there is a richer conception such as that employed by Mellor (1981, ch. 8; 1995, 123) which takes 'part' to mean 'well-demarcated subdivision that figures as a unit in causal explanation'. Could it be that I have shown that objects have temporal parts only in the former sense, whereas the proposed distinction between objects and events relies on objects not having temporal parts in the rich sense? Even if concrete particulars persist by perduring, it does not follow that any of the Lewisian temporal subdivisions in which a persisting object consists is a 'well-demarcated subdivision', it may be argued. I do not think this turns out to be a legitimate worry, however, since Lewis's argument for perdurance is intended as an account of significant intrinsic changes in persisting objects. It seems that some of the Lewisian temporal subdivisions of a persisting object will count as temporal parts in the richer sense also, as well-demarcated subdivisions which may figure in causal explanations (although it seems clear that not all of them will). For instance, a particular key which is bent will not open the lock for which it was made for the entire time that it bent (although it might open some other locks), whereas the straight Lewisian temporal parts of the key will open the lock; it seems that at least some of the temporal stages of a persisting object can figure as units in causal explanations. If particular objects have temporal parts in the weak Lewisian sense, it seems inevitable that some will have temporal stages in the richer sense also. In addition to this, the examples of unchanging events cited earlier would also serve as counterexamples to Mellor's thesis that temporally extended events

resisted, or weakened,[21] but the claim that particular objects always endure and events always perdure seems equally contentious, as Mellor admits.[22] This does not seem to be a solid criterion upon which the ontological distinction between particular objects and events might be founded. Perhaps whatever the analysis given of the persistence of objects, it will be equally applicable to the persistence of events. This much will have to remain as conjecture, however, since space does not allow a thorough examination of the alternative accounts of the persistence of objects and events on offer.

The search for essential features of objects or of events, in virtue of which the category of concrete particulars divides into two, does not appear to have uncovered any strong candidates. Failure in this search may lend some support to the third alternative mentioned above that events and objects do not, strictly speaking, constitute distinct ontological categories, being distinguishable as such only relative to each other, according to the extent of their persisting or changing relative to other concrete particulars, perhaps. Furthermore, additional positive support for the conceptual interdependence of the category of objects with that of events is provided by the objections to the proposed criteria, that either events are changes, or that they have temporal parts. In each case, the proposed distinguishing feature had by *either* objects *or* events turned out to be a feature of *both*; if the responses are correct, objects and events turn out to have a surprising collection of characteristics in common. Such a view has its advantages: if the distinction between objects and events is not grounded in reality, then 'borderline' cases such as changeless events or sub-atomic entities which at once behave like particles (objects) *and* like waves (events) are no longer problematic, since there is no ontologically interesting line for them to be categorised on the wrong side of[23]; and there would be little reason to be worried by apparent cases of causation involving objects rather than events.

All this does not entail that there is *no* such ontologically grounded distinction, of course; but, while it remains undiscovered, such an essential difference can be of no help in bringing questions of the ontological dependence between objects and events (or vice versa) into sharper focus, nor create tangible worries for an account of causation which investigates both species of concrete particular together. For present purposes, it seems reasonable to treat what might be two ontological categories as if they were one; although I shall, for the most part, conform to the most common usage in everyday causal language and conduct the discussion in terms of particular events.

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are 'never wholly present at any instant' (1995, 123), although Mellor would object to any use of 'fantasy' examples such as that from Shoemaker (1969). See Mellor (1982, 66).

[21]See, for example Johnston (1987), Forbes (1987).

[22]1995, 123.

[23]In the latter case of wave-particle duality, such entities can be treated as events *and* objects, whereas they turn out to be problematic on views which maintain that the two ontological categories are essentially distinct and mutually exclusive.

4.3 Singular Causal Statements Reporting Event Causation

Events, as I have characterised them so far, roughly conform to the Davidsonian conception of such entities: they are concrete, dated particulars which are analogous to, but not dependent on, the class of things or objects.[24] They may be picked out by singular referring terms (names, and definite descriptions if these, against Russell, are treated as referring terms), by ostension, or referred to demonstratively, as are objects; we may as easily speak of 'that marriage' or 'that shouting' as we do of 'that table'. When talking about events we appear to have, as Davidson puts it, 'all the machinery of reference' at our disposal.[25] Also, since such particulars exist independently of language, the description which picks out an event may be incomplete, and several *different* descriptions may pick out the *same* particular event. Appropriating Davidson's example: the flicking of the switch, the turning on of the light and the alerting of the burglar may all be descriptions picking out the same event.[26]

Since it is incoherent to suppose that any entity can at once be and not be the cause of a particular effect, singular causal statements relating events are transparent: substitution of co-referring expressions in either the cause or effect position preserves the truth value of singular causal claims. If it is true that 'The collision with the iceberg caused the sinking of the Titanic', and these events are reported on page six of Wednesday's newspaper and page four of Thursday's newspaper respectively, then 'The event referred to in the report on page six of Wednesday's newspaper caused the event referred to in the report on page four of Thursday's newspaper' is also true. Singular causation relates events independently of our ability to describe or explain them and to specify their structure with regard to picking out the causally relevant properties they instantiate. This makes the ontology of D-events very coarse-grained, in comparison with that of abstract particulars, and the resulting range of redescription available for any particular cause or effect is correspondingly so broad that singular causal claims can only be relied upon to be minimally explanatory. A true singular causal statement 'c caused e' is only guaranteed to provide a minimal explanation of *what* caused a particular event, and need give us no information as to *why* c caused e, citing no interesting information except for the (unanalysed) fact of the causal relation holding between them.[27]

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[24]1980, chs. 8, 9 and *passim*.
[25]1970b, 181.
[26]1967a.
[27]Davidson maintains that there is (for him, at least) an important distinction between 'explaining that an explosion occurred in the broom closet and explaining the occurrence of the explosion of the broom closet' where the former is explanation of a type of event and the latter of the *particular* event which occurred. 'Explanation of the second sort touches the particular event as closely as language can ever touch any particular' (1967a, 162).

However, before the claim that singular causation relates particular events can be accepted, some account is required of how such entities are to be individuated as wholes, rather than in terms of the features or internal structure they may have, or the descriptions under which they fall. The conclusion that singular causal relations are extensional when co-referring terms are substituted for the whole cause or whole effect holds whichever category of entities are accepted as being singular causal relata, and so, as in the case of abstract particulars, some characterisation of what is meant by 'same event', and hence when terms co-refer, is desirable. If an event cannot be individuated except as according to certain of its features or the kind to which it belongs, making certain of its properties essential to the event, it seems that the claim that singular causation relates *particular events* simpliciter would be significantly weakened, in favour of accounts in which singular causation relates particular events in virtue of their instantiating a property or universal, or their being partially constituted by certain property-instances.[28] An account is called for of what counts as the same event and when particular events are distinct: some criteria of individuation and identity are required.

4.4 The Identity and Individuation of Events

There have been two main proposals for identity and individuation criteria for D-events which do not involve reference to any other categories of entities – objects or property-instances – with which events may be associated.[29] The provision of such 'free-standing' conditions is economical from a methodological point of view, in that it does not require individuation criteria to be formulated for other categories of entities *prior* to the formulation of criteria for events, nor does it make the success of the individuation of events dependent on the success of these other criteria. Moreover, it shields the advocate of events from the accusation that the ontological category of events is derived from other categories – objects and properties, say – and therefore that events are ultimately reducible to these in either a definitional, or a stronger ontological, sense.

The first proposal is that events may be individuated by their causal roles, such that events are identical if and only if their causes and effects are identical.[30] However, this is unsatisfactory, especially in the context of the present discussion about the nature of causes and effects, for similar reasons to those which prompted the rejection of such a criterion in the case of abstract particulars.[31] Firstly, we cannot talk as if a particular event may not have had the cause or the effect which it actually did; or, to put the point

[28]In which case, the account of event causation would be threatened by collapse into those involving abstract particulars discussed in Chapters Two and Three.
[29]Given the earlier discussion of the relationship between objects and events (4.2), the criteria to be considered may well serve to individuate both species of concrete particular equally well.
[30]For example, Davidson's initial proposal in 'The Individuation of Events' (1969, 179).
[31]See 2.4.

slightly more tendentiously, it makes the causal sequence to which an event belongs essential to that event.[32] Secondly, this criterion requires some prior notion of causal role, or 'having the same causes and effects' making it quickly run into a definitional circle. Although circularity of constitutive identity conditions is far more acceptable than epistemological circularity, since it may be regarded as a fundamental case of ontological interdefinition, the individuation of events as causes and effects on the basis of their causal role seems trivial and unilluminating. The circle does not encompass enough conceptual diversity to mark out any interesting cases of conceptual interdefinition: it immediately characterises causes in terms of other causal concepts. Moreover, should causes and effects transpire to be entities other than D-events, we would expect the causal role criterion of individuation to apply to these entities and not to D-events as well. For these reasons, individuation by causal role is not a particularly useful proposal.

The second proposal is that events may be individuated according to their spatio-temporal locations, such that two events are the same if they spatio-temporally coincide exactly. This provides a strict criterion for the identity of particular events, although in everyday talk of events which picks particular events out by descriptions and hence in terms of types, an element of vagueness enters. We may want to say that two spatio-temporal regions which do not coincide exactly are both the token instance of a type, both are the same wedding, or the same explosion, but this vagueness, or failure of our ordinary classification to match with spatio-temporal criteria, is not problematic. Quine remarks that the difficulties are no different to those encountered in applying the spatio-temporal criterion to the individuation of particular objects, such as desks or mountains, and this problem with vagueness 'attests only to the vagueness of the term 'desk', or 'my desk' [say], and not to that of 'physical object''.[33] With this, I concur. Purely for the purposes of making existential claims, that such-and-such an event exists, the way in which the event is picked out is not important; the important thing is that the event is picked out. The importance which attaches to the way in which an event is described does so when we are interested not merely in asserting the existence of the event but in asserting something about it, placing it in some causal pattern or classifying it in relation to other particulars. The current aim was to provide identity criteria generally for the class of particular, *unrepeatable* events, and although questions of vagueness may arise as to the ways these will fall under types, this is not an issue to be included in the consideration of singular causation.

Some philosophers have argued that events can only be identified if they are *necessarily* spatio-temporally co-located; that is, co-located in every possible world in which they

[32]Those, like Davidson, who would deny that individuation involves essences would reject this way of speaking.
[33]1985, 167-8.

occur.[34] This added constraint arises from the view that, unlike objects, events are not impenetrable, that it is possible for two events to occur in the same place at the same time. A frequently cited example is that of a sphere which is simultaneously heating and rotating. However, although co-location is certainly true of *types* of events, since each particular event may fall under any number of types, it seems that particular events cannot be co-located. To conceive of the heating and rotating sphere as two events requires a prior taxonomy of properties or property-instances or tropes. The conception of D-events so far advanced, at this rather arbitrary stage of individuating particulars at least, is silent on what might be contained within the region of space-time (there *might* be nothing, but the event would still have dimensions as long as other, 'non-empty' events existed) and the objects or properties a region of space-time might contain are, just from the point of view of arbitrarily picking out particular events, irrelevant. In the case of the sphere, it is not yet clear what the properties of heating and rotating are; it may turn out that the heating-and-rotating are *one* individual property of the sphere, conferring very different causal powers on the sphere than that which heating, or rotating, would do alone. There is not a clear enough conception of what the qualitative features of events are to be able to get the example of co-located events off the ground. Moreover, this extra modal constraint is also dubious if it is regarded as a means of distinguishing events from objects since, as Wiggins has suggested, distinct things or objects might also be able to occupy the same spatio-temporal region.[35] If one agrees with Brand and Lewis about events, then it seems advisable to take seriously the possibility of distinct co-located objects also, so once again the categories of events and objects display common features. However, in the case of objects, it seems all the more clear that the possibility of co-location is only conceivable for *types* of objects; I shall therefore treat actual spatio-temporal co-location as sufficient for the individuation of concrete particulars.

In view of the problems encountered with the individuation of abstract particulars, two worries must be allayed about the proposed spatio-temporal criterion for the individuation of events: firstly, that this criterion may, like the causal role criterion, turn out to be problematically circular; and secondly, that individuation on spatio-temporal grounds makes the causal ontology of concrete particulars susceptible to objections from the classificatory sceptic, analogous to those which present serious difficulties for an account of causation in terms of properties and nomic connections.[36] If either of these are the case, then concrete particulars fare no better as a suitable causal ontology than some variety of abstract particulars.

[34]For example, by Brand (1977); Lewis (1986c).
[35]1967; 1981.
[36]See 3.5 - 3.11.

It remains a possibility that the concept of spatio-temporal location will, when analysed, require some recourse to matter and what happens to it, and thus, ultimately recourse to objects and events, and to causality. Unlike the suggestion to individuate entities according their roles in singular causation however, this circularity is not conceptually trivial since it links causes and effects with other concepts apart from just that of causation. Also, although it may be impossible to break out of the circle, the individuation criteria we are concerned with are to be regarded as *constitutive* of D-events and objects rather than epistemic individuation criteria, so this is not vicious circularity; rather, it is akin to the inter-dependence of properties and nomic connections.[37] Thus, it seems acceptable to treat the circle which includes objects and D-events, space and time and then, perhaps, matter and causation, as a fundamental piece of metaphysical interdefinition or conceptual inter-dependence which, at the level of fundamental ontology, can probably not be avoided. Fundamental ontology appears to be awash with such circles of inter-definition, perhaps this is a mark that these entities *are* fundamental, there being no other way to individuate fundamental entities except by a regressive postulation of ever more dubious entities which themselves require justification as to their ontological status.

The second worry is that the metaphysical picture of causation in which concrete particulars play the role of primary causal relata is open to criticisms similar to those made against the property theorists' essentially nomological account of causation. The arguments of the last two chapters suggested that the fine-grained ontology of sparse properties required both an ontological assumption as to their existence – the Natural Properties Principle – and an additional presumption concerning our favoured epistemic position with regard to such entities. Otherwise, the properties which we think there are seems to be ultimately dependent upon their having roles within a *particular* system of classification and generalisation, and there seems to be nothing about our theory or the world to favour the system of classification we have over a multitude of other possible ones, aside from the fact that *we* are using it already. Pending the settlement of the dispute about scientific realism, there is reason to be sceptical that there is a fact of the matter about which system of classification is correct. In the absence of the additional assumptions therefore, the range of properties or 'genuine' universals which our best theory says the world contains is in some sense arbitrary: even if the world does divide into sparse properties, there is no guarantee that the taxonomy of our best causal theory is not 'strange' with respect to these objective perfectly natural properties.[38] The discussion of concrete particulars as the relata of causation is in part intended to provide a causal ontology which is not susceptible to analogous difficulties; so, if this is not true of

[37]See 2.4. Lombard reaches a similar conclusion about when circularity counts as a serious objection to proposed constitutive identity criteria (1986, 43 - 6).
[38]See 3.6.

concrete particulars, then they will have little to recommend them as favoured candidates for singular causal relata. In this case, even the most determined classificatory sceptic would be well-advised to look upon the ontological and epistemic assumptions required by the property-theorist in a more favourable light.

However, this kind of scepticism appears to be avoidable with a coarse-grained ontology of spatio-temporally individuated concrete particulars, since there appears to be no way in which our account of which concrete particular is at which place can be globally mistaken, when these particulars are *not* being considered with respect to which type or kind they are. Moreover, although we may have to analyse time in terms of sequences of events, these particular events need not be associated with any single system of classification, so the analysis of time is not dependent on the theory we happen to be using. If we were we to attempt to sort these particular events into types, they may be ones which would fall under many systems of classification rather than one particular system; a sequence of completely anomic events permits an analysis of time or, at least, of relative temporal location. Likewise, the spatial criteria, for which matter is most probably a prerequisite, involve a taxonomy of matter into particular objects regardless of their fitting into one particular system of classification rather than many different ones. This shared ontological status of particular events and particular objects is especially unsurprising if, as was suggested earlier, there is no substantive ontological distinction between these species of entities, *qua* spatio-temporal particulars, there being no way to differentiate the features of persistence and change in a region of space-time except in contrast to each other. From this, it would be expected that *both* events and objects exist (albeit undifferentiated into 'two' categories of entities) independently of any *specific* system of classification and generalisation, if it is the case that one of these categories does.[39]

There does seem to be some promise of a suitable individuation criterion for events and objects, then, in terms of their spatio-temporal co-ordinates, which does not imply that additional presuppositions are required in order to ensure that the entities which we think exist in the causal ontology are those which there actually are. Objects and events can be treated as existing independently from their place in a particular theory.[40] Because spatio-temporal criteria do not rely on the identification of entities within a region of space-time – neither particular objects, nor properties, nor the relations between them – they are quantitative criteria rather than qualitative ones. Singular causation may relate spatio-temporally individuated concrete particulars, the contents of spatio-temporal

[39]I will discuss whether some form of classificatory scepticism, or Putnam's model theoretic argument, can be extended to singular causation itself (which has hitherto been presumed to be a theory-independent phenomenon) in Chapter Five (5.2 - 5.4).

[40]The strength of this conclusion that events are mind- and theory-independent depends upon the extent to which space and time (or space-time) can be treated as objective phenomena.

regions, in extension, no matter the description used to pick them out and regardless of the determination of any components or internal structure they may have.

4.5 Are all singular causes and effects events?

If the relata of singular causation are always D-events, then any true singular causal statement should report a causal relation holding between particular events. The canonical form of a singular causal statement on this view is a sentence containing two singular terms referring to event, connected by the term 'caused': 'c caused e'. But many singular causal statements do not conform to this model, appearing to relate very different entities such as facts, states of affairs, or property-instances. So how do these non-canonical statements fit into the story? If this account is to be successful, the apparently singular causal claims found in everyday language which do not conform to the thesis that causation relates concrete particulars must either be accounted for, or else explained away: the former by illustrating how these claims do, despite appearances, report a relation holding between concrete particulars; the latter by denying that they are reports of singular causation at all.

Supporters of the latter option maintain that sentences such as 'The building collapsed because the bomb went off' or 'The force of the storm caused the severity of the structural damage' are not reports of singular causation, but *causal explanations*. In cases such as the former, the sentential connective 'because' asserts an explanatory connection rather than a causal one and, in cases in which 'caused' relates terms that denote entities other than particulars, the context of its employment makes it a species of causal explanation also. Sentences such as 'The force of the storm caused the severity of the structural damage' quantify over events, but do not contain singular terms referring to particular events[41]; the meaning of the apparently causal connective here is best given as 'causally explains'. In contrast to the transparency of the causal relation, the relation of explanation – in statements such as 'C explains E' – is opaque: the relation between explanans and explanandum does not persist with the substitution of co-referring expressions for 'C' or 'E', nor would it for the substitution of co-referring singular terms which appear within 'C' or 'E', the truth value of the sentence may be altered by such substitution.[42]

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[41]It is usual to treat 'the' as a quantifier in this sentence. If 'the' is not treated as a quantifier here, 'the force of the storm' could be treated as a singular term referring to an aspect of an event, or a property that it has, but in no case can 'the storm' be treated as a singular referring term picking out a *concrete* particular; to avoid the redundancy incurred by referring to the force of the storm twice, 'the storm' must refer to a particular on the 'thin conception', abstracted from any properties it has. See Armstrong (1978a, 114 - 6).

[42]This strategy is sometimes attributed to Davidson (for instance by Menzies (1987, 64-5), who takes some of the arguments against this strategy from Mellor (1986)). However, a closer reading of 'Causal Relations' (1967a, 161) suggests that Davidson wishes to maintain that non-canonical forms of singular causal

The distinction between causation and explanation may provide a successful account of the apparent counterexamples in ordinary language to the thesis that causation obtains between events and only events, but the onus is on the event theorist to supply some justification for it, over and above its utility in blocking these counterexamples. Without such justification, invoking the distinction appears, as Mellor puts it, to be rather an *ad hoc* manoeuvre, in addition to conflicting with the common-sense connotation of causation that causes somehow explain their effects.[43]

In some sense, there is a trivial and uncontentious distinction between causation and explanation, since the former is a relation which obtains between entities in the world and the latter relates sentences (or facts, or propositions, if you wish to countenance such entities within your preferred metaphysical picture). It has so far been a working assumption of this thesis that causation is a phenomenon which would occur in the absence of any sentient beings with the ability or inclination to explain[44], whereas the activity of explanation is reliant on the existence of such beings. The concept of explanation is bound up with the assertion of truths and provision of reasons for the way things are, with causal explanations being one species of such reason-giving, an answer to questions concerning the occurrence of entities in the world. As such, causal explanation is a linguistic activity (one linguistic activity among many), whereas causation is not; but merely stated thus, the distinction between causation and explanation is unable to carry any metaphysical weight.

One could argue, on the basis of this distinction, that the intensionality of causal-explanatory statements arises because they are mind-dependent, that asserting truths in the course of the linguistic activity of explaining is dependent on the background beliefs of the audience.[45] If the substitution of singular co-referring terms fails to preserve the truth value of explanatory statements, then this intensionality would originate from the same source as substitution failure in propositional attitude contexts, failures of substitution being dependent upon the presence or absence of other beliefs (and other propositional attitudes) or the requisite inferential connections holding between them. It may be true that I believe that Kurt Gödel is dead, while not true that I believe that the man who proved the incompletability of arithmetic is dead; co-referential substitution in this propositional attitude context will only preserve the truth value of the propositional

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statements relate explanans and explananda, *as well as* (in some cases) reporting, or entailing, the existence of a singular causal relation holding between events. This seems to bring Davidson's view closer to the entailment account discussed later in this section. However, objections to the strategy currently under discussion will apply if *any* apparent non-canonical singular causal statement must be treated as purely being a causal explanation.

[43]1995, 130-1. See 1.3.

[44]See 1.3. For a defence of this claim in the case of event causation, see 5.2 - 5.4.

[45]A view defended by Rosenberg and Martin (1979), for example.

attitude ascription on condition that I have a further belief or beliefs. Most simply, it requires that I believe that Gödel and the man who proved the incompletability of arithmetic are the same person, that the terms co-refer to a single entity and that I have the same attitudes to this entity under either of these descriptions. Whether or not truth is preserved depends upon the other propositional attitudes of the subject and the way these are connected with each other.

However, the suggestion that explanatory statements are intensional as a result of the mind-dependence of the explanatory relation is not particularly convincing, since the beliefs of the audience appear somewhat irrelevant in determining whether or not an explanatory relation holds. If 'The force of the storm explains the severity of the structural damage', this does not just rely on the beliefs of the audience about the connections between severe storms and structural damage, it also seems to depend on there *being* such connections. Moreover, one could argue that the argument that explanation owes its intensionality to mind-dependence relies upon conflating the truth of an explanatory claim with its explanatory success. This latter feature *does* depend upon the background beliefs of the audience, it is an aspect of the general problem of information-giving, and so is mind dependent; but, that should not lead us to conclude that the truth of an explanatory claim is similarly afflicted.[46] The supporter of the extensionality of explanation can accept that some explanatory claims appear to cease to be explanatory on the substitution of co-referring terms and yet deny that explanation is intensional; in such cases, the explanatory relation still holds, even though the explanation fails to be effective due to the beliefs or interests of the audience.

Once the distinction between the truth of an explanation and its explanatory success is suggested, a successful defence of the distinction between causation and causal explanation based on the mind-dependence of the latter appears unlikely. However, there is space enough for alternative strategies by which the distinction may be defended. I think there are some good reasons arising from the discussion of properties and laws in the previous chapter[47] to believe that the distinction between causation and explanation may turn out to be well-founded, and thus that sentences reporting causal relations and those reporting explanatory relations will diverge in their logical properties accordingly. However, such a defence of the distinction would rely on the rather controversial conclusions about the ontological status of properties and laws suggested in Chapter Three[48] and these are unlikely to be acceptable to opponents of the thesis that the relata

[46]See for example Bromberger (1965), Lewis (1986b, 218 - 221), Lombard (1979).
[47]See 3.5 - 3.11.
[48]This alternative defence of the distinction between causation and causal-explanation will be expanded in Chapter Five when an alternative to the realist account of properties is considered (5.13).

of singular causal relations are concrete particulars. It would strengthen the event theorist's case if she is not forced to rely upon the previous failure of alternative options.

Moreover, even those who concur with the distinction between causation and causal explanation may be troubled by it being used in this way to uphold the thesis that singular causal relations obtain only between concrete particulars, since rejecting *all* non-canonical singular causal statements as not being reports of singular causation leaves a curious dichotomy between reports of causal and causal-explanatory relations. On this account, the term 'caused' in ordinary English turns out to be ambiguous, with its meaning dependent upon the logical form of the sentence in which it occurs; as a result, apparently valid inferences are rendered invalid in virtue of what appears to be merely a grammatical accident. For instance, the following argument from Menzies is intuitively valid[49]:

George's being distracted caused his failure to break in time.
George's failure to break in time caused the accident.
Therefore, George's being distracted caused the accident.

But, on the account of non-canonical singular causal claims currently being considered, its validity relies on equivocation in the use of the word 'caused' in the premises and the conclusion: in the latter it is genuinely causal, since it relates events; in the former the relations are explanatory. When applied to our everyday inferential practice, the wholesale rejection of non-canonical causal claims on the basis of the distinction between causation and causal explanation leads to counterintuitive results.

As Mellor points out, causal explanations intuitively state causal relations, but on this account the apparent counterexamples to event causation do not do this: they causally explain, in the absence of a causal relation holding between the explanans and explanandum.[50] For the intuition that causes explain their effects to be satisfied, causation and explanation must connect the same species of relata in the same sort of way – either extensionally or intensionally – but, on this view, events cause and sentences explain. Events, *qua* particulars, cannot correspond to sentences, so 'causal explanantia can neither be nor correspond to causes nor... explananda to effects'.[51] It appears that the existence of an event could be causally explained without there even being any prior event to which it was causally related. The difficulty with this approach, as it has been

[49]1989, 65. For the purposes of this example I will assume, with Menzies, that failures are *not* events. This assumption will be examined in more detail at the end of this chapter (see 4.6 - 4.7).
[50]'Why else, after all, should we use 'be*cause*' as an explanatory connective?' he adds (1995, 131). However, this observation appears to be a peculiarity of English, and recourse to language-specific morphology in support of a philosophical point is highly dubious.
[51]1991, 207.

presented so far, seems to be that it emphasises the differences between the relations of causation and causal explanation, without providing an analysis of how they are connected, and therefore deals with the counterexamples to event causation at the expense of ignoring an intuitive connotation of causation. In the absence of a principled explication of the connections between causation and explanation, which indicates how causal explanations depend for their truth on the instantiation of some relation holding between cause and effect, the charge of 'dichotomy!' is likely to stick.

With this in mind, there is an alternative approach which the event theorist can adopt to accommodate non-canonical singular causal statements by maintaining that every singular causal statement *entails* the existence of a causal relation holding between concrete particulars. If *all* singular causal statements submit to this treatment, then the distinction between causal and causal-explanatory sentences will be superfluous to the defence of the thesis that singular causation relates events, but will remain consistent with it; one can hold on to event causation without allegiance to the distinction between causation and causal explanation. However, for those who do uphold the distinction, the entailment view has the advantage of suggesting a connection between causation and causal explanation so needed above: true non-canonical causal statements are *causal* explanations in virtue of their entailing the existence of a causal relation holding between events.

Some such combination of these two views seems to be that held by Davidson:

> What we must say in such cases is that *in addition to*, or in place of, giving what Mill calls the 'producing cause', such sentences tell, or suggest, a causal story. They are, in other words, rudimentary causal explanations.[52]

However, the cautious note in this quotation is well advised, since it is by no means clear that every true singular causal statement does indeed entail the existence of causally related concrete particulars: it would strengthen the event theorist's case still further if she were able to explicate some mechanism by which the entailment holds.

To this end, one could demonstrate mechanisms by which non-canonical singular causal statements may be parsed into canonical ones, such that those statements which report causal relations between entities other than concrete particulars are translatable, or 'semantically reducible'[53] into sentences which do so, perhaps in conjunction with other sentences. Thus, events can be maintained as the *primary* relata of singular causation with all singular causal claims, which apparently report entities *other* than events being related causally, being statements of singular *causation* only insofar as they are reducible to

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[52]1967a, 161. (My italics.)

[53]The term is that used by Menzies (1989, 65-6).

statements which report a relation holding between particular events. Thus, a sentence such as 'The force of the storm caused the severity of the structural damage' could be re-construed as a singular causal claim relating particular events, the particular storm and the particular damage. Any information contained about the individual properties of those particular events may be regarded as extraneous, going over and above a simple singular causal report of the *existence* of a causal relation, and being instead an answer to the explanatory question of *why* that causation took place in the way it did.[54] Similarly, the sentential relata of the connective 'because' can be transformed by grammatical devices which render them into nominalisations, which have the logical form of singular terms. One proposed method is to take the gerundive nominalisation of each sentence, turning the sentence 'The bomb exploded' into 'the explosion (exploding) of the bomb', a singular term referring to an event.[55] Thus, 'The building collapsed because the bomb exploded' is a true singular causal statement in virtue of a causal relation holding between two D-events – the particular explosion and the particular collapse – and 'The explosion of the bomb caused the collapse of the building' is the canonical form of a report of the causal relation between the events.

Of course, some method of semantic reduction might be employed by supporters of any of the other candidates for the role of causal relata to dispose of what are for them non-canonical singular causal statements, but this matters not to the supporter of concrete particulars. If the programme of semantic reduction continues successfully, the apparent counterexamples to causal relata being particular events and objects will have been neutralised, with the added advantage that their *causal*-explanatory import can be accounted for on the basis that they entail the existence of a singular causal relation obtaining between concrete particulars. There seems reason for being optimistic that this programme will work: given the correct grammatical devices, it may transpire that all *bona fide* singular causal claims can be translated into to talk of a relation predominantly holding between particular events. Thus, the event theorist can uphold her claim that any true singular causal statement entails the existence of causally related concrete particulars.

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[54]Not all event theorists would concur with this: if causation is characterised as a relation between particular events *in virtue of* the properties they have, then information about the properties of the particular cause and effect may be regarded as elucidating this singular causal relation in more detail, rather than being extraneous or 'merely' explanatory. This view will be discussed in more detail in Chapter Five (see 5.6).

[55]Suggested by Rosenberg and Martin (1979), who wish to incorporate this device into a revised test for the extensionality of causal claims. If the extensionality of causation is accepted, however, their revised test amounts to converting non-canonical singular causal claims to those referring to events and then testing for extensionality, which is similar to the proposal presented here.

4.6 A Problem with Causal Statements about Negative States of Affairs

However, the event theorist's optimism is premature, since some species of non-canonical causal statements are immune to the treatment above, and therefore do not obviously entail the existence of a relation between concrete particulars. Some apparently singular causal statements relate negative states of affairs which when translated make *negative* existential claims about events, verified by the non-existence of those events. Since events are particulars and there are no negative particulars, it makes no sense to talk of non-events standing in causal relations to each other. On the putative grammatical translation scheme outlined above, a causal claim such as 'There was a fire because the sprinkler system failed' becomes 'The failure of the sprinkler system caused the fire'[56], and 'Don did not die because he did not fall' becomes 'Don's not falling caused his not dying'[57], but both these examples make claims about events which did *not* obtain being causally efficacious. On the account of event causation developed so far, these claims cannot be causal because there are no particular events – there are no failures and no non-deaths – for the causal relation to relate.[58]

The argument against negative events is analogous to Ramsey's reasoning for the impossibility of negative things or people.[59] A fact, such as that the sprinkler system is working entails the existence of an event of a certain sort, which is the working of the sprinkler system. Moreover, the fact that the sprinkler system is working efficiently also entails the event which is the working of the sprinkler system (since no event can be the working of the sprinkler system and efficient without also being the working of the sprinkler system). However, in the case of negative existential statements such as 'The sprinkler system did not work' the entailment of adverbial modification runs the other way: 'The sprinkler system did not work' entails *both* 'The sprinkler system did not work efficiently' and 'The sprinkler system did not work inefficiently'. If there were a negative event – the sprinkler system's failure – which exists just in case of the sprinkler system not working, then this particular event would have to be *both* efficient *and* inefficient to preserve the entailment. Since it cannot be both efficient and inefficient, it does not exist. This precludes taking negative events as being among the events which may be quantified over by ordinary sentences, and thus blocks the translation of singular causal statements citing negative states of affairs as causes or effects into those referring to events.

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[56]This example comes originally from Mackie (1965) and is discussed by Davidson (1967a), Menzies (1989), Mellor (1995) and others.
[57]The example is from Mellor (1991, 208).
[58]By those who reject the slingshot argument, this line of reasoning is used to conclude that some singular causal relations must sometimes relate facts, rather than some species of particular (see, for example, Mellor (1995), Menzies (1989), Bennett (1988)).
[59]Ramsey (1925).

This *reductio* works because it juxtaposes the possibility of the semantic reduction of singular causal claims relating facts or states of affairs into those relating D-events against two aspects of a specific doctrine concerning the adverbial modification of events which is advanced by Davidson.[60] The argument of the preceding paragraph firstly relies on Ramsey's thesis, that a sentence such as 'Frank fell' does not refer to the event of Frank falling, but makes an existential claim about the existence of a certain kind of event, that there is an event which is the falling of Frank; and secondly, upon an analysis of the logical form of sentences containing adverbs, which breaks up the assertion that 'Frank fell quickly' into an existential claim containing a conjunction, that there is an event which is the falling of Frank *and* it is quick.

As such, the objection is only decisive against those who wish to adhere to all three doctrines – Ramsey's thesis, Davidson's account of adverbial modification *and* the thesis that singular causal claims which do not relate events are semantically reducible to those that do – because the former two conflict with the latter, and the latter is the more contentious of the three. One could still maintain that events, including negative states of affairs construed as a species of event, are the relata of causation and provide alternative analyses of how events relate to sentences or of the logical form of adverbial phrases, but these latter doctrines are so heavily embedded in the account of events which has so far been advanced that it is unlikely that most theorists favouring D-events as primary causal relata would want to give them up. Because of this, it is argued that causation must be able to relate entities which can cope with the causal efficacy of negative states of affairs, entities which, to do this, cannot be concrete particulars.

4.7 A Response to the Problem of Negative States of Affairs.

The argument that singular causal statements relating negative states of affairs are not translatable into those reporting relations between particular events is commonly regarded as decisive against the view that concrete particulars are the sole category of entities which play the role of causes and effects.[61] However, I disagree that this conclusion is inevitable, since event-causation can be formulated so as to avoid the objection that the causal ontology of concrete particulars cannot include enough particular entities to provide the relata for every singular causal claim.

In response to this type of counterexample, the event theorist again has two options: on the one hand, she could return to the putative distinction between causation and causal explanation and dismiss the reduced number of recalcitrant cases as purely being causal explanations, rather than reports of singular causal relations; on the other, she can

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[60]1967b.

[61]Mellor (1995, 11.2), Steward (1997, 156-7), Menzies (1989, 66).

attempt to show how, despite appearances, statements which seem to report causal relations between negative states of affairs do entail the existence of a causal relation holding between concrete particulars. As before, the latter option would be the most satisfactory, in preference to relying on a distinction forged from a specific account of properties and laws, or which rests upon the contentious claim of the mind-dependence of explanation.[62] Even if we permit that the relationship between causal-explanatory statements and singular causal statements is less direct than the former explicitly entailing the latter, such as Lewis's proposal that to give a causal explanation is to 'tell, or suggest, a causal story' or to 'provide some information about a causal history'[63], the suspicion remains that such explanations should depend for their truth (at least in part) upon the existence of some causal relation.

Fortunately for the event theorist, it seems that she can resist the conclusion that singular causal statements relating terms referring to negative states of affairs cannot be accommodated within her causal ontology without resorting to this strategy alone. Firstly, she can admit the shortcomings of the semantic reduction method for identifying the particular events involved which are the relata of the singular causation, without conceding that there are no such events. Although the grammatical devices, such as gerundive nominalisation, utilised within this strategy can transform non-canonical causal sentences into those which do have the requisite grammatical structure to refer to concrete particulars, the descriptions used to pick out these particulars may not always provide enough information to explicitly designate that event, in order for us to identify the cause or the effect involved. Nor, the event theorist may add, should these failures be reason for surprise or concern: we should not expect the relationship between language and the world to be so close as to permit that every true report of singular causation (on suitable grammatical transformation) explicitly designates the cause and the effect. The ontology of concrete particulars is an ontology of spatio-temporally individuated, unrepeatable particulars, the question of whether or not such entities fall into sorts or types of particulars is not of interest within the discussion of singular causation where any similarities which may obtain between singular sequences of causation are not at issue. Aside from its spatio-temporal description, the descriptions applicable to a particular event are not essential to it and, as must be clear from some of the unproblematic examples of singular causation relating events presented so far, there may not be enough information contained within the description by which a particular event is picked out to explicitly designate that event. Thus 'The striking of the iceberg caused the sinking of the Titanic' and 'The event referred to in the report on page six of Wednesday's newspaper caused the event referred to in the report on page four of Thursday's newspaper' and 'The event referred to in the article which the cat sat on

[62]See 4.5.
[63]1986b, 217.

caused the event referred to in the article John threw away' may all be true reports of the *same* singular causal relation. As Davidson urges, one may specify the whole cause of an event without having wholly specified it,[64] and so there seems no problem with the idea that factual causal statements may be similarly too impoverished in terms of the information they contain for us to pick out the causing event, without this implying that there is no such event.[65]

Not that we do not sometimes have a guide in this matter, even where one or both of the facts related by the singular causal statement make negative existential claims about events, as in the case of 'Frank did not die because Frank did not fall'. No event exists which is a death of Frank; but this entails that it is true of every actual event that it is a non-death of Frank, in virtue of the logical relations between the existential and universal quantifiers.[66] The best guide we have to which of these particular events is the effect in this case is the spatio-temporal region to which the predicate 'is a non-death of Frank' is most applicable, presumably the one involving Frank, and similarly for the cause. Frank's not-falling at t_1 causing his not-dying at time t_2 are particular events which are time-slices of Frank[67], which are presumably causally related to each other and which, in Mellor's scenario of the climbing accident, are best redescribed as Frank's hanging on and his survival respectively. Asserting that 'Frank did not die because Frank did not fall' is most probably in breach of the pragmatic rules of relevance which govern information-giving but this is only a problem for statements which are intended to be explanatory, not for reports of a singular causal relations.[68]

However, the event theorist is not yet home and dry. It is all very well, says Mellor, to debate which particular entities exist – Frank's survival or his death, his fall or his hanging-on – but this will not help the event theorist's case, since there are still not enough particular events to provide the causal ontology. Although factual singular causal statements of the form 'E because C' and '¬E because ¬C' cannot be true together, 'each is as obviously causal as the other: if either of them is a causal statement, both are'.[69] But while C requires the existence of an event, ¬C requires the *non-existence* of that event and so, once again, it appears that the event theorist cannot have enough concrete particulars to go around; one of these facts would require the existence of a negative particular and, as is shown by the contradictions which arise upon the adverbial modification of such negative particulars, that is impossible.

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[64]Davidson (1967a, 156).
[65]Kistler has suggested that the logical form of factual causal statements reveals whether they will be able to explicitly designate an event via the descriptions they contain. See Kistler (1997, 139).
[66]Namely, that: $\neg(\exists x)\ Fx$ is logically equivalent to $(\forall x) \neg Fx$.
[67]By which I mean temporal part in Lewis's sense (see footnote 20 of this chapter).
[68]Lewis (1986b, 226-8).
[69]Mellor (1995, 134).

There is a problem with this argument, however, since it rests on an implausible claim about *false* causal statements which the event theorist neither makes, nor requires, in order to maintain the position that all singular causal statements entail the existence of concrete particulars for the causation to relate. All the event theorist's entailment claim amounts to is that *if* a singular causal statement is *true*, then an existential claim is true about the existence of concrete particular cause and effect; there must be a sufficient number of concrete particulars in the actual world to be the relata of any actual instance of singular causation. Since the conjunction of the singular causal claims 'E because C' and '¬E because ¬C' is always false, however, the problematic existential claim involving negative particulars need not be true either; so, in no case does the event theorist require the existence of an event and a non-event.

Mellor's conclusion would follow were the absence of a causal relation between the entities picked out as cause and effect the *only* way in which a singular causal statement could be false, since this would uphold a stronger reading of the entailment claim above that the existence of concrete particulars follows from *any* singular causal claim (true or false). But the event theorist is not committed to this and, as a general claim, it is just incorrect to say that the *only* way in which a causal statement may be false is because of the absence of a causal relation between the entities picked out as cause and effect. A singular causal statement may be false either because no causal relation obtains between the entities picked out as cause and effect, or because one (or both) of the putative relata do not exist. It is, I presume, false that the movement of Jupiter into close proximity with Venus in the early evening sky last night caused me to dye my hair; although both particular events existed, no-one but a committed astrologer would claim a causal relation between them. On the other hand, it is not true that the invasion by the Libyan navy caused the Fall of the Roman Empire, since there was no invasion of the Roman Empire by the Libyan navy. But this does not require the existence of a negative particular, a non-invasion, since it is not true that the existence of particular 'relata' follows from *any* singular causal statement (true or false), only that the existence of causally related particulars follows from all *true* singular causal statements. The Fall of the Roman Empire was caused by another event (the correct description of which historians are still arguing about), although within the ontology of concrete particulars, we are quite at liberty to designate it by the blatant misnomer of 'the non-invasion by the Libyan navy' if we choose. The ontology of spatio-temporally individuated concrete particulars has no resources to move from the actual to counterfactual situations, so there need not be particular events for every instance of causation which might have happened.[70] The event

[70]This could be construed as a limitation of this account, transgressing what Mellor calls 'the counterfactual connotation of causation' (1995, 2), although it is still trivially true that if 'c caused e' is true, then if c had not existed, e would not have existed either.

theorist can remain committed to the claim that the cause and effect sentences in 'E because C' and '¬E because ¬C' entail the existence of particular events, without requiring the existence of negative particulars. Mellor's argument does not reach its goal.

Moreover, as Dorothy Edgington remarks, if Mellor's argument worked, it would prove too much and have bizarre ontological consequences in the actual world.[71] She gives the example of a tennis match which she loses, so there is no such event as her victory, and thus there is such an event as her opponent's victory. If she does not win, then she does not win easily, and she does not win with difficulty. But, it does not follow from this that her opponent's victory is both easy *and* hard-won, yet on Mellor's reasoning and the spatio-temporal individuation of events that is implied. If Mellor's argument worked, *any* actual event in which one person's loss is another one's gain would have contradictory properties, and this is a consequence which is obviously unacceptable.

The fact theorist's objection that causation between particulars cannot account for singular causal statements relating negative states of affairs appears to be ill-founded. Firstly, the event theorist can accept that transforming non-canonical singular causal statements into those which do relate singular terms picking out events does not always provide enough information to explicitly designate which events are the cause and the effect, without this implying that there are no such events. Secondly, although every singular causal statement entails the existence of causally related particulars, the meaning of 'entailment' is such that the existence of cause and effect only follows if the singular causal statement is true. Since Mellor's objection relies upon mutually incompatible singular causal statements, the event theorist can do without negative particulars and accommodate the apparent counterexamples to event causation. Moreover, if the objection were correct, it would have absurd consequences for the ontology of the actual world of the variety that Edgington points out. (My win is their loss, but that doesn't make it the case that my win was both easy and hard won.)

4.8 Singular Causation between Events

It turns out, therefore, that the event theorist does not need to invoke a questionable distinction between causation and explanation in order to uphold the thesis that causes

[71] 1997, 422. She also expresses the worry that Mellor's account of the entailments involved in adverbial modification of negative particulars are inconclusive since he ignores the scope ambiguity of the negation in phrases such as 'Don does not die painlessly'. This does not have to entail the existence of an event which is a painless non-death – this would make the ontology absurdly over-populated with events – rather, it might entail the existence of a non-death or a death which is not painless, depending on how the ambiguity is cashed out. To take her own example: 'one must distinguish (a) 'I did not speak rudely' and (b) 'I did not speak, rudely' i.e. 'I rudely did not speak'. (a) but not (b) is entailed by 'I did not speak'; (b) but not (a) entails the existence of a rude failure to speak. *If* (a) entails the existence of an event, it is an event which is either a failure to speak, or an utterance which was not rude.' (1997, 422).

and effects are always particular events or objects. Although events are not the referents of every noun phrase which may appear in the relata position of a singular causal statement, every true singular causal claim may be translated, or is 'semantically reducible' into one which is phrased in terms of singular terms referring to events and retains its truth value on the substitution of terms co-referring to the same spatio-temporal region; thus, concrete particulars are the primary relata of singular causation. This increases the number and variety of statements taken to report singular causation, calming the intuition that, on some level at least, there should be no difference between what sentences, such as 'The explosion of the bomb caused the collapse of the building' and 'The building collapsed because the bomb went off', express.

Moreover, in characterising the ontology of causes and effects in terms of spatio-temporally individuated concrete particulars, the event theorist avoids sceptical objections analogous to those which afflicted the account of sparse properties[72], the alternative candidates for singular causal relata. As coarse-grained *particulars*, individual events and objects do not essentially instantiate a certain property or kind, over and above their falling under the general category of being a concrete particular, so arguments to the effect that *in principle* we can never know whether a particular object (say) is really grue, or green, or some other observationally indistinguishable kind, cannot gain a foothold. So, at this point, the event theorist does not require any assumptions regarding our favourable epistemic situation with regard to causes and effects similar to those which some property theorists presuppose.[73] Also, since the ontology of concrete particulars is anything but sparse[74] and is consistent with a world in which entities do not divide up naturally into types or kinds (that is, every concrete particular is qualitatively unique), the event theorist does not require a primitive ontological assumption concerning the existence of an objective standard of similarity and difference or a particular set of sparse perfectly natural properties, such as the Natural Properties Principle.[75]

At this stage of its development, at least, it appears that an account of causation in terms of concrete particulars is more economical than property based causation with respect to the presuppositions required to bolster its plausibility on an ontological and epistemological level. Moreover, accepting that the ontology of singular causation involves concrete and not abstract particulars also widens the scope of how the world

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[72]Or entities partially constituted by them, such as states-of-affairs.

[73]See 3.9. Whether the event theorist requires such an epistemological assumption later depends upon which theory of properties or kinds she opts for, in order to account for the relationship between singular causation and causal generalisations, and between causation and explanation. This issue will be dealt with in Chapter Five (see 5.5).

[74]They are also not countable entities: one cannot resolve questions such as how many particular events have occurred in this room since noon yesterday, for example. Whereas the number of *sparse* natural properties in the actual world, although perhaps infinite, cannot be uncountably infinite.

[75]Again, whether she requires such an assumption later depends on the account of properties accepted.

may turn out to be: causation and generality may turn out to have nothing to do with each other; we might be living in an anomic world. Such factors will become important in the course of the next chapter. Even if the case for the postulation of natural properties should be vindicated, I am unconvinced of their suitability as the relata of singular causal relations, preferring instead the more robust, spatio-temporal concrete particulars. In his defence of facts as causes and effects, Bennett provides one of the best pieces of unwitting support for this viewpoint I have so far encountered, giving three reports of a singular causal relation:

> The vase broke because a heavy stone was dropped on it.
> The vase's destruction was caused by the fall of a heavy stone.
> The vase broke when a heavy stone sent shock waves through it.
>
> The first two of these report causes, a fact in one case, an event in the other. The third reports a pusher, an exerter of force, and this is neither a fact nor an event but a stone.[76]

The moral that Bennett envisages is that facts are no worse off than events as singular causal relata; but, surely a stone is a concrete particular if anything is.

As yet, however, not enough has been said about the implications of accepting that singular causation relates concrete particulars, or about how, or even whether, this relation is to be characterised. Much more also needs to be said about the relationship between the coarse-grained ontology of singular causes and effects and the fine-grained system of properties and laws which most of our causal explanation involves. I will leave these discussions for the next chapter.

[76] 1988, 22.

CHAPTER FIVE

EVENT CAUSATION, EXPLANATION AND THE MIND

5.1 Event Causation and the Mind: The story so far.

At this stage in its development, the account of event causation outlined in the previous chapter possesses a notable advantage over its rivals with regard to accommodating the phenomenon of mental causation. When singular causation is treated as a relation between concrete particulars, it is neutral with regard to which properties such events or objects may have, or the descriptions under which they fall, so mental events fit into the causal order unproblematically, on the condition that they too can be treated as spatio-temporally individuable particulars.[1] Event causation is consistent with the *Principle of Causal Interaction* between the mental and the physical, that mental events can cause, and be caused by, physical events.

Moreover, when combined with an assumption about the causal closure of the physical, the Completeness Thesis, this account of causation also throws some light upon the nature of the relationship between the mental and the physical. If mental events can cause or be caused by physical events, and every physical event is caused by prior physical events, then the Token Identity theory is true: every particular mental event is identical with a particular physical event, although it remains an open question whether there is any lawlike correspondence, or identity, between mental and physical properties or types. Thus, in its present form, event causation permits the defence of a form of monism or physicalism which accords with the minimal constraint that, in Fodor's words, all our 'taxonomies must apply *to* the same things'.[2] The exact status of the mental with regard to the physical is still up for grabs, however, and the strength of this relationship will ultimately be dependent upon which theory of properties is adopted to supplement the coarse-grained ontology of event causation in order to account for causal explanation. In the course of this chapter I will argue that adopting a realist construal of properties to do this job creates intolerable difficulties for the event theorist, in that it threatens the consistency of event causation with either the Token Identity theory or the Principle of Causal Interaction. In light of this, the event theorist would do better to provide an alternative account of the explanatory ontology, the form of which will be proposed.

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[1]It is not wholly uncontentious that mental events may be treated in this way, but I shall not argue further for this position here. (For arguments that mental events are spatio-temporal entities, see Lockwood (1984a, 1984b, 1985).) The implications of denying that mental events are spatio-temporal particulars will be touched upon later in this chapter (see 5.9).

[2]1975, 25 (italics in text).

5.2 The Return of the Classificatory Sceptic

Before the account of event causation can be developed any further however, its proponents must respond to the worry, mentioned in the previous chapter, that event causation may be susceptible to some sceptical argument analogous to the Classificatory Scepticism applied to property causation in Chapter Three. If the account of singular causation as a theory-independent phenomenon holding between concrete particulars is so afflicted, then the motivation for rejecting the accounts of causation between facts or properties, in favour of causation relating concrete particulars, will be somewhat weakened. However, as was already noted in Chapter Four, causes and effects themselves appear to be immune to the classificatory sceptic's worries within an ontology of causally related concrete particulars[3]; it is now time to focus upon whether similar objections can be successfully directed at the characterisation of singular *causation* as the theory-independent phenomenon it has hitherto been assumed to be.

One version of this difficulty is presented by Putnam as an extension of his model-theoretic argument against metaphysical realism[4]:

> Let *causation** be the image of the term 'causes' under some nonstandard reference relation – any admissible relation R* which is not the 'right' relation [R]. (...speaking within the metaphysical realist picture, of course...) Then, if God had picked out R* instead of R to be the "right" relation (or, if "physical reality" had), all these physicalists would now be worshipping Causation* and not Causation.[5]

To put the problem another way, we may think that we are talking about Causation when we assert a singular causal claim about the relation between two concrete particulars – 'A caused B' – but we might be picking out one of an innumerable selection of utterly *strange* phenomena, such as Causation*, Causation**, Causation*** and so on. If we maintain that our ordinary concept of causation is of a theory-*independent* phenomenon, then we are stuck with a fundamental epistemological problem about how we know that things in the world are caused rather than caused*. If there is a good argument for saying – with the cautious property theorists of Chapter Three – that the question of which perfectly natural, sparse properties there are is to some extent dependent upon the theory that we are actually using, then there appears to be an analogous case for saying that what counts as causation is equally theory-dependent. One of the original desiderata of the metaphysical account of causation was that it characterise causation as theory-independent, a natural relation or process which occurs independently of sentient beings

[3]See 4.4. This immunity does not extend to object and event *types*, of course.
[4]Putnam (1984) applies the argument to causation in particular.
[5]1984, 6.

and what they have to say about it; but, if this objection has any force, it seems likely that this desideratum must remain unfulfilled. One could make an existential assumption, along the lines of the Natural Properties Principle, that there is a natural, theory-independent process in virtue of which events occur, but then the determined sceptic could continue to maintain the likelihood of our being globally mistaken, from within the confines of our theories, about what that process is.

5.3 The Consequences of Causation*

An initial response to this sceptical threat is to explore its consequences should it be taken seriously and the existence of any form of theory-independent causation denied. Were this option taken, it would alleviate any philosophical problems we may encounter in accommodating mental causation, but it does so at the expense of transforming our worldview into a version of anti-realism, or ultimately idealism, since it entails that everything that happens is in some way dependent for its happening at all upon how we think about it. Mental causation becomes unproblematic, since all apparently non-mental causation is an artefact of our inter-subjective theory; within certain theoretical constraints we are free to postulate causal relations wherever we choose and this would no doubt include the behaviour of human minds, the original artisans of the causal theory. But there would be nothing happening independently of our theory with which the causal powers of the mind must be fitted.

This view would usefully resolve one of the main philosophical issues of this thesis by not allowing the problem of mental causation to be raised, but that appears to be the extent of its advantages, and it also has a selection of counterintuitive consequences. Firstly, much of our common-sense conception of the world turns out to be utter falsehood: for instance, if there is *no* theory-independent phenomenon of causation, the genesis of any sentient beings becomes wholly mysterious and the belief that the universe had a causal history before that time is merely false; cosmology and evolutionary theory would have the status of convenient myths. Secondly, the fallibility of our knowledge with regard to the happenings of the world becomes decidedly peculiar, since even the appearance of something going on outside the scope of our theory becomes something which will be difficult, if not impossible, to explain. There would be no independent factor via which to resolve theoretical conflicts, nor to prompt the rejection, or development of our theories. There is a parallel here with the worry expressed about the explicability of error and false belief within the strongly realist accounts of properties discussed in Chapter Three, if our favourable epistemic access to perfectly natural properties is presupposed; there is simply not enough scope for our theories to be wrong.[6]

[6]See 3.10. This parallel is also drawn by Baghramian (1998, 302). The problem of the explicability of error is also raised by Davidson with respect to his own philosophical position (1989, 166).

Thirdly and finally, the severity of the former two complaints is in danger of becoming considerably magnified, since the acceptance of this form of sceptical attack threatens to lead in the direction of idealism or solipsism, generalising into the kind of radical scepticism about the external world happily rejected in Chapter Three.[7] If the sceptic can raise the threat of our theory-independent world being one operating according to Causation* (or some other strange phenomenon), while we are universally misled into believing that it behaves as it does because of Causation, then it seems only a small step to extend the argument to host of related general concepts; after all, physical reality might really be one consisting in Matter*, Objects*, Events* and so on, but then how do we know that it is not really Physical* Reality*?.[8] One could accept this without ratifying idealism and admit that there is no way of knowing what the world is like, even implicitly, apart from all the (theoretical) versions.[9] But this amounts to disavowing interest in issues concerning causation and the mind about which we have been hoping for some illumination. Obeying Goodman's dictum – 'Never mind mind, essence is not essential and matter doesn't matter' – would alleviate the difficulties which this thesis is addressing, but our worldview becomes highly counterintuitive if we rest content with this easy way out.[10]

5.4 An Anti-Sceptical Strategy

The reason that the consequences of giving in to the sceptic are so extreme is, at least partially, due to the minimalism with which the concept of causation has been characterised so far, which allows it a high degree of generality. However, it is precisely this minimalism which should permit the event theorist to maintain the somewhat dogmatic assumption that some form of causal process occurs in the world independently of it appearing in our theories. The pre-theoretical conception of causation sketched at the start attempted not to make any empirical or metaphysical commitments as to the nature of causation[11] and the characterisation of singular causation obtaining between concrete particulars does not add to these commitments, either explicitly or implicitly. In this, the treatment of causation is analogous to Johnston's minimalist conception of persistence, with respect to which finding a specific account of the nature of persistence is left open.[12]

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[7]3.9 - 3.10.

[8]If the argument can be extended to concerns about validity – does the conclusion follow from the premises because the argument is valid, valid*, or valid**? – Putnam's line of reasoning might ultimately lead to its own demise.

[9]This would amount to adopting Goodman's 'irrealist' stance (1978, *passim*) with which Putnam is sympathetic (1981, xi).

[10]Goodman (1978, 76).

[11]See 1.3.

[12]1987, 133.

Event causation is compatible with the world being anomic – that is, its having *no* objective causal, or nomological, structure – or, with its having a sparse structure, as on the account of causation between perfectly natural properties, or with that structure being abundant.[13] It is also compatible with causation being discontinuous, operative at some times and places, but not at others; or, with causation being a continuous process, a flow or flux of happenings from which even talk of singular causal relations obtaining between concrete particulars represents something of an abstraction. The possibility of this latter option may have been somewhat disguised by the loose and convenient talk of singular causal *relations* which has pervaded the discussion of causation so far. However, causation as a continuous process is compatible with an ontology of particular events and objects if these are treated as entities analogous to particular vortices in a flowing stream which, although they are still spatio-temporally individuable, cannot be more than relatively isolated from the stream, they cannot exist separately from it, nor from each other.[14] To paraphrase Johnston[15], on this minimal conception of causation, it is *as if* we had fixed the reference of our term 'causation' not by means of a substantive account of the nature of causation but by saying that causation just is that actual process which is such that entities appear to alter and interact independently of us[16]; 'causation' so introduced names a highly determinable process ...it is very hard to describe how the actual world could misleadingly fail to exhibit causation.

The minimalism embodied in treating singular causation as obtaining between concrete particulars stands in stark contrast to the property-based account of causation which entails that causation must essentially be nomological in nature, due to the nature of the entities which occupy the role of causes and effects. To deny that there is no theory-independent causation in *this* sense is not to make a radically sceptical claim (indeed those who deny the strong realist account of properties will be forced to do this[17]) for it is simply to deny that causation has an essentially nomological nature. As Lewis remarks, those who deny a specific account of the nature of causal processes 'never seriously renounce the commonsensical view that there is plenty of causation in the world': 'They may preach the "downfall of causality" in their philosophical moments. But whatever that may mean, evidently it does not imply any shortage of causation.'[18]

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[13]Which may, as Lewis notes, turn out to be much the same as the world having no structure at all from the point of view of theorising about causation (1983b, 192).

[14]The analogy is drawn by Bohm (1980, 10).

[15]1987, 133-4. Johnston, as mentioned above, wishes apply his strategy to persistence, rather than causation.

[16]Except in cases where the causal interaction involves a mind.

[17]See 5.13 - 5.16.

[18]1986b, 217. Lewis is arguing here that his account of causal explanation may be sustained independently of his own views about causation being correct, and is specifically concerned with the question of whether or not causation is essentially indeterministic.

However, to deny the existence of *any* theory-independent event causation is tantamount to claiming that nothing happens independently of us. This amounts to radical scepticism and, although it may not have been listed by Moore himself, it seems to transgress a basic tenet of common-sense. Thus, the scepticism directed against this account of event causation is disanalogous from the Classificatory Scepticism directed against the ontology of sparse, natural properties: accepting the sceptic's claim in the former case would require the revision of much which we take to be common-sense; while the latter specifically concerned the plausibility of a certain metaphysical doctrine based on the Natural Properties Principle, which had itself been accepted as primitive. Also, the claim about the objective existence of causation which is sustained in order to disarm the sceptic about event causation is much more minimal in its metaphysical and empirical commitments than the assumption required to disarm the classificatory sceptic, and therefore the former seems much harder to deny.[19]

The event theorist's strategy against the sceptic would be greatly strengthened by our being able to observe or experience causation or causal sequences directly, rather than having to infer existence the existence of such entities and processes. This is not so troublesome as Hume's failed project to discover a sense impression corresponding to our idea of necessary connection[20], for we neither require observation of a connection or relation, nor perception of any necessitation, determination, regularity or constant conjunction, universality or the like; in the first instance, because we would not expect that to be possible (whatever our account of perception), and, in the second, because these are not features essentially associated with causation on this view.[21] Accounting for the perception of particular objects and events – causes and effects – should fall well within our philosophical and empirical grasp. It does not seem too extravagant to assume, therefore, that some account of perception can be given which allows for the observability of causation, or sequences of causes and effects.[22] This is not to suggest that we cannot be wrong about the existence of specific instances of causation: particular judgements may be overturned, but then the appearance of causation would be explained away in each mistaken case by appeal to more causation occurring elsewhere, or between different particulars. Furthermore, the event theorist can accept that which cases of causation we pick out is partially determined (mediated) by our perspective on the world, our human

[19]To recall: the acceptance of Classificatory Scepticism which questioned whether we could know which perfectly natural properties there are left our common-sense view of the world intact, so pressure to reject the scepticism by assumption could not be mustered from that quarter; also, the assumption required to disarm the classificatory sceptic was much more specific, maintaining the existence of a substantial connection between perfectly natural properties and the contents of our thoughts, which may create internal conflict within the *a posteriori* realist view (see 3.10).

[20]*Treatise of Human Nature* i. 3. sect. 2.

[21]Anscombe (1971, 92-3) and Ducasse (1926, sect. 5) make similar points.

[22]Alternatively, one could argue that we have direct experience of causation, either via ourselves as agents (Lowe, (1996, 42), or because some causal flow of events is implicit in the flow of our conscious experience (Bohm (1978, 10) whose pre-theoretical characterisation of consciousness owes a lot to James (1892)).

needs and interests, without conceding that the fact these occurrences happen at all is somehow dependent upon us. There is scope here for further investigation, but I shall leave this issue aside from now on.

The event theorist may yet find stronger arguments to defend the characterisation of causation given so far from sceptical attack. However, as I noted above, the threat would have been much more serious had the metaphysical picture of event causation placed some constraints upon what kind of phenomenon causation turned out to be, for then it could not be discounted so easily as a case of radical scepticism. Since event causation neither requires, nor involves metaphysical or physical commitments about the nature of causation, I suggest that the event theorist is entitled to maintain the belief in the existence of some theory-independent causal process.

5.5 Causation and Causal Explanation: Theories of Properties

As it stands, the event theorist's causal ontology is too impoverished to account for causal explanation. Singular causal statements can only be relied on to be minimally explanatory, they at least report *that* an instance of singular causation occurred, but within the coarse-grained ontology of concrete particulars there are no resources through which we can account for the increased explanatory value of causal statements which describe the cause and the effect in certain ways; that is, we cannot yet provide an account of what makes our causal explanations work.[23] However, this much is not a problem: this is a *causal* ontology; at this stage, it is not also required to account for our explanatory practice and the truth of our causal-explanatory claims. But, if event causation is to provide a plausible alternative to those accounts of causation which take properties, or states of affairs to be causal relata, some account is required of how we explain why particular instances of singular causation occurred and frame causal generalisations and causal laws, both within the preserve of science, and as an important part of our everyday explanatory practice.

For this, the event theorist must supplement her causal ontology of spatio-temporally individuated concrete particulars with an account of how the world is divided up into causal types or kinds, or of how we divide it; she needs a theory of properties, or an account of the application of predicates. The remainder of this chapter will investigate whether any factors counsel in favour of one account of properties rather than another, or if the choice of explanatory ontology can be treated as a matter of personal preference.

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[23]I shall, as in Chapter Four, distinguish between the success of an explanation, which is partially dependent on the beliefs of the audience, from its truth (see 4.5). The discussion will concern the latter.

In light of the previous discussions about properties, it seems clear that event theorist is initially faced with a decision about whether to adopt a realist account of sparse properties, universals or tropes, as considered in Chapter Two, or to look for an alternative account of properties which avoids having to make the ontological and epistemological assumptions that the realist account involves; firstly, that such entities exist; and secondly, that we can know which sparse properties the actual world contains. The former option has the methodological advantage of being convenient, since it provides the event theorist with a ready-made theory of properties straight from the shelf, whereas the discussions of properties so far have only given the merest hint of what form the latter option might take. If the event theorist chooses not to shelter in the realist camp, then a lot of work remains to be done.

I shall start therefore, by exploring the more convenient route of supplementing the account of singular causation holding between particular events with some version of the realist construal of natural properties, universals or tropes. As usual, I will discuss the issue in terms of natural properties (with divergences from Lewis's account clearly marked), but the choice of ontology is largely irrelevant to the discussion at hand.

5.6 Event Causation and the Realist Construal of Properties

The addition of natural properties to the causal ontology of concrete particulars has immediate explanatory advantages. Construing causally related events and objects as instantiating natural properties enriches the minimalist conception of these entities as spatio-temporally individuated concrete particulars. This richer conception offers a simple and immediate explanation of how and why concrete particulars are of certain kinds – because of the natural properties they instantiate – which, in turn, permits the relationship between causation and generality to be explicated.[24] Thus, this version of event causation need have no worries with regard to accommodating the Moorean fact of objective sameness and difference and can also account for the apparently close relationship between singular causal instances and causal laws. On this view of causation, a version of the *Cause-Law Thesis* turns out to be true: every instance of singular causation is an instance of a nomic connection, and so falls under a causal law.

Particular events enter into the singular causal sequences they do in virtue of the properties they instantiate, so the same kind of causes will have the same kind of effects.[25] On the most plausible accounts of sparse natural properties, the nature of properties is

[24]This shift in the conception of a particular will become important when the plausibility of the Token Identity theory is discussed (see 5.12).

[25]I will assume that indeterministic causation could be fitted into this picture should it be required; perhaps, such that a certain kind of cause always raises the chances of a certain kind of effect.

inextricably linked with their roles in the nomic connections relating them,[26] so the property, or properties, in virtue of which a particular event causes a particular effect will be nomically related to the properties which make the particular effect the kind it is. Every singular causal sequence will instantiate a general causal regularity or nomic connection,[27] so there are no genuine cases of pure *singular* causation. Like the metaphysical account of causation in terms of properties alone[28], the ontology of properties and particular events is essentially nomological. Of course, any particular cause or effect will instantiate properties which are *not* nomically related to properties instantiated by the effect or cause respectively; in any particular case, not all properties instantiated will be causally efficacious. Taking the pill alleviates the pain of my broken arm because of its pharmaceutical properties, rather than its being red or round: there are nomic connections between ingested morphine dissolving in the blood, being absorbed through the blood-brain barrier or into the spinal cord and activating opiate receptors, which decreases neuronal activity in the neural systems responsible for pain (such that my pain does not go away, but it ceases to feel unpleasant). On the other hand, I brake when I see the traffic light in virtue of its being red, not because of its intensity or height from the ground. Whether any properties, or families of properties are causally inefficacious in general, and which properties these are, are vexed questions, to be tackled later in relation to the mind.

5.7 Problems with Natural Properties and Mental Causation

In addition to the worries about the plausibility of the realist construal of properties explored in Chapter Three, it turns out that the event theorist is not best served by choosing this account of sparse natural properties, from the point of view of providing a suitable account of mental causation. As in the account of causation based on natural properties,[29] various accounts of mental causation and explanation may be based upon the metaphysical picture of event causation and sparse natural properties, depending upon which auxiliary assumptions are accepted regarding the nature of the mental and of the physical. The *Completeness Thesis* is again of particular importance here, without which the problem of mental causation cannot even be raised, and also the *Principle of Mental Anomalism* which concerns the status of mental properties with respect to physical ones, that is, whether mental properties are nomologically incommensurable, or anomalous, with respect to physical ones. The respective status of these assumptions in the debate differs however, since the former is required for the problem of mental causation to arise, while the latter is not, although its acceptance heavily influences the way in which the

[26]Either: the perfectly natural properties that exist determine which nomological causal connections there are, or vice versa, or properties and nomic connections are ontologically interdependent.
[27]The distinction between these is not at issue.
[28]See 2.8.
[29]See 3.12 - 3.16.

problem of mental causation can be accommodated. It transpires, though, that the supporters of this account of causation and causal explanation will encounter difficulties whether or not they accept the Principle of Mental Anomalism: either event causation becomes unmotivated and should be dropped in favour of a fine-grained causal ontology involving properties and nomic connections; or the project of accommodating mental causation is fraught with difficulties and the prospect of finding a plausible and consistent theory dim. Assuming that the Principle of Causal Interaction is not available for denial, the event theorist is faced with a choice between abandoning the realist construal of properties, or changing camps to join the property theorists, since the account of causation obtaining between concrete particulars no longer plays a useful explanatory role.[30]

Without the addition of the Completeness Thesis, there are no principles within the theory of causation itself to preclude events which instantiate mental properties causing events which instantiate physical properties and vice versa. Since the Natural Properties Principle is unspecific about whether all and only natural properties are physical properties (where 'physical' is defined in such a way that mental properties are not excluded from counting as 'physical' by definition[31]), mental events may causally interact with physical events, and the properties in virtue of which these events are mental or physical be nomically related to each other unproblematically. The problem of mental causation does not arise.

However, many philosophers find this picture unsatisfactory[32]: if widespread causal overdetermination is ruled out and the physical does not include mental properties, it implies that the physical is not causally closed. Mental causation has been accommodated in this philosophical system at the expense of jettisoning a plausible assumption about the physical world – the Completeness Thesis – which is defined by Papineau as the principle that: 'All physical effects are determined, or have their chances determined by prior physical [causes] according physical law.'[33]

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[30]There is another parallel here with the worries about property theories (see 3.3, 3.4, 3.10): if we are prepared to justify metaphysical accounts on the basis of inference to best explanation, and a certain account is consistent and coherent and yet does no explanation, then its acceptability can be more easily called into question.

[31]This caveat is required since some philosophers define the physical in terms of the mental (Rorty (1979)) making it trivially true that mental properties are not physical.

[32]With a few notable exceptions mentioned in Chapter Three (3.15): for example, Crane (1995), Dupré (1993), Baker (1993) who counsel in favour of rejecting the Completeness Thesis and thus do not face a problem with mental causation.

[33]1993, 16.

I will not examine the arguments which have been offered in favour of the Completeness Thesis at this point,[34] but simply note that its acceptance brings the problem of mental causation in its wake. If it is always the case that physical events are caused by other physical events, then it becomes difficult to say how mental events fit into the causal picture. Causal overdetermination is generally accepted to be a rare phenomenon, limited to bizarre cases such as the death of a man being caused by his being shot, stabbed and struck by lightning simultaneously; so we do not want to concede that every instance of human behaviour is causally overdetermined by physical and mental events. Somehow the supporters of this account of causation have to contend with this problem, and explain the difficulty of mental causation away.

The way in which the problem of mental causation can be accommodated depends, in turn, upon whether the Principle of Mental Anomalism is true. Mental events can cause physical events on this account of causation, but this does not entail that mental and physical properties can be nomically related to each other. On the one hand, it might be argued that mental properties are anomalous or 'nomologically incommensurable' with physical ones, and therefore inherently irreducible to them. On the other hand, mental and physical properties may be thought to be identical, or to be related nomologically in some atemporal analogue of the nomic connections which act as truth-makers for causal laws, such as supervenience, realisation, composition and so on. Some supporters of the latter accounts also consider mental properties to be irreducible to physical ones, despite the existence of nomic connections between them. Hence, it would be misleading to reserve the term 'non-reductive' solely for those theorists who maintain the nomological incommensurability of mental and physical properties.[35]

5.8 The Overdetermination Argument

I will deal firstly with the accounts of event causation and the mind which do not attempt to sustain the Principle of Mental Anomalism, in order to temporarily set them aside, since it seems that the supporters of these accounts ultimately find themselves in the same predicament as the property theorists with regard to giving an adequate account

[34]For a comprehensive survey of such arguments, see Spurrett (1999). Unlike Lewis for example, who takes the completeness of physics to be contingent (1986d, 178), Papineau (1991; 1993) and Spurrett (1999) have argued that the Completeness of Physics is a necessary truth, trivially true from the only plausible definition of 'physics'. However, if this is the case, it is *contingent* whether or not mental properties are to be included in the physical (the more families of properties that can be excluded from the physical, the less trivial the Completeness Thesis becomes), so the continuing debate between these two sides has no bearing on the current discussion.

[35]Here I agree with Crane (1995, 213) that the more familiar division between 'reductive' and 'non-reductive' does not usefully distinguish between theories of mind, partially due to controversies over the nature of reduction. I will presume that the truth of the Principle of Mental Anomalism entails the irreducibility of mental properties to physical ones, due to the impossibility of any form of bridge laws or principles, but grant that it is not clear the entailment holds in the other direction. See 3.13.

of mental causation and the relationship between the mental and the physical. The nature of this relationship is usually characterised as a form of the Token Identity theory, which identifies mental and physical particulars, but does not go as far as identifying mental and physical properties or types. However, I will suggest that the combination of event causation with the realist construal of properties – call it nomological event causation – entails the *type* identity of mental and physical properties. Unless the supporters of this view make an ill-founded distinction between the *causal* ontology of events and the *explanatory* ontology of properties, this account results in a theory of mind which relates the mental to the physical as strongly as that of the sparse property theorists, and no explanatory gain appears to have been made by characterising causation as a relation between particular events.

The Overdetermination Argument for the Token Identity of mental and physical particulars draws upon the ban on widespread causal overdetermination in order to reconcile mental causation with the completeness of physics.[36] The Completeness Thesis asserts that all particular physical events are caused by prior physical events, but, it is argued, those mental events which we take to cause physical events are not overdetermining their physical effects in conjunction with some distinct physical event, since the particular mental and physical causes are identical. The particular thought and the neuro-physiological event which appeared to simultaneously cause my action, for instance, were the same particular, rather than being two distinct ones which overdetermined their effect.

Whether this argument for Token Identity can be sustained at all depends upon the strength of the ban on causal overdetermination. As Crane points out, 'Opinions differ over whether overdetermination cannot happen or just does not happen'.[37] The standard view seems to be that causal overdetermination cannot be ruled out on *a priori* grounds, but that it is not a prevalent phenomenon, since there would be something coincidental, inefficient and untidy about the causal interactions of the natural world were that the case; it is, as Schiffer suggests, 'hard to believe that God is such a bad engineer'.[38] The problem for those who do not wish to invoke the Overdetermination Argument in conjunction with the Principle of Mental Anomalism is that the existence of nomic connections between the mental and physical properties of co-located mental and physical causes would make the occurrence of psychophysical overdetermination explicable and non-coincidental, it would just be a matter of natural law that a mental and a physical cause *both* bring about an action. The reasons for ruling out prevalent

[36]This has been defended by Hopkins (1978), Peacocke (1979) and Papineau (1993) (who now advocates a Type Identity theory, see Papineau (1998)).
[37]1995, 215.
[38]1987, 148.

causal overdetermination do not seem to apply in the psycho-physical case, so the ban on overdetermination which generates the Token Identity theory of mental and physical particulars turns out to be a very weak premise in the argument which bears its name.

In addition to this difficulty, this account of the relationship between the mental and the physical appears to be considerably stronger than the Token Identity theory that its supporters promised. A particular mental event causing a particular action is identical with a physical particular, but it is mental in virtue of instantiating a particular mental property, and physical in virtue of instantiating a particular physical property. Every instance of a mental type is the instance of a physical type and, in the absence of the Principle of Mental Anomalism, there is no *a priori* reason for there to be no nomic connections obtaining between them. There is a relationship between mental and physical properties to be explicated and, as the discussions of properties in Chapter Three concluded, the most plausible formulation of this relationship is the Type Identity theory: mental and physical properties are identical. Moreover, if the event theorist also maintains that an event causes its effect in virtue of the properties it instantiates, which was a principal motivation behind adopting the account of natural properties to supplement the theory of event causation, it becomes all the more probable that Type Identity is the only available solution here.[39] If the event theorist wishes to avoid the charge that the mental properties of an event are epiphenomenal, having no bearing on the effects that event has, a weaker relation than identity between properties such as supervenience or realisation does not seem to do the job. This account of the relationship between the mental and the physical has lost the distinctive attraction that it had when it promised a minimal ontological story about the token identity of mental and physical particulars, weaker than the Type Identity theory by which the property theorists are best served, and which avoided the sceptical problems that property theory encountered.

Moreover, it now seems that there is very little reason for nomological event theorists to be event theorists at all. In the absence of a substantial distinction between singular causation and causation considered in the general case, the nomological event theorists' insistence upon the ontology of particular events as singular causes and effects seems *ad hoc* and lacking in motivation. Explanatory statements would be as extensional as singular causal statements relating events – their truth value would be preserved on substitution of terms referring to the same property – because they are true or false in virtue of the presence or absence of 'real' relations in the world, which obtain independently of how we pick them out. There seems to be no good reason for particular events to play the role of causal relata, rather than the properties in virtue of which those events causally interact, making this metaphysical picture appear wantonly uneconomical in terms of the

[39]See 3.12 - 13.

entities it includes and the objections to both properties and events which it would be forced to answer. The worry here is not that this account is inconsistent, but merely that there is a methodological peculiarity of insisting on *event* causation when it is acknowledged that it is the properties which do all the causal work. I would suggest, therefore, that those who would maintain event causation in conjunction with the realist construal of properties would be better served by some version of the latter alone, unless the Principle of Mental Anomalism is accepted.

5.9 The Principle of Mental Anomalism

Although the most famous argument for the Principle of Mental Anomalism appears first in the work of Davidson,[40] who would not accept the view of properties currently under consideration, a version of his argument could be accepted by those who do. In this, their theory would differ from Davidson's with respect to the status of physical properties, but the status of some groups of mental properties would coincide. In brief, the Davidsonian argument claims that the ascription of propositional attitudes[41] or intentional states to a subject is governed by considerations of rationality, coherence and consistency, which are normative constraints that 'have no echo in physical theory'.[42] These are required because the mental is holistic, in the sense that the ascription of one propositional attitude to a subject only makes sense against a background of other ascriptions, and because the evidence which supports the ascription of a belief (say) to a subject is in principle incomplete. Part of the problem here is the interdependence of belief and meaning, since the ascription of propositional attitudes relies on the interpretation of linguistic communication: we discover what a speaker believes and desires from understanding what she means; and we can only find out what someone means with some prior idea as to the beliefs or desires she may be vocalising.

The rational constraints which govern the ascription of propositional attitudes are, as Child emphasises, uncodifiable in principle: even if there are some 'true, exceptionless principles of rationality', 'they will not be such as to deliver a detailed answer to every question (or, more ambitiously, to any question) of the form 'What should I do, or believe, in these circumstances?', it is impossible to provide a complete specification of a subject's propositional attitudes no matter how much evidence is available.[43] Because of this, propositional attitude psychology 'cannot be, or be incorporated, into a closed system' such as the physical system of sparse natural properties in virtue of which events are causes and effects. The nature of a natural property, to recall, is determined by the

[40]1970, sect. II.
[41]I will use this term as neutrally as possible.
[42]1974, 231.
[43]1994, 58-9.

role it occupies in nomic connections; if the Davidsonian argument is correct about the absence of strict nomological connections between propositional attitudes, or between these and physical properties, then the nature of this subset of mental properties must be inherently different from that of physical properties such that the former will be irreducible to the latter even if certain propositional attitudes were found to co-vary with certain physical properties.

This appeal to the irreducible rationality inherent in the ascription of propositional attitudes is just one way of supporting the Principle of Mental Anomalism for one group of mental properties; just how extensive the ramifications of this argument are depends upon which mental properties count as propositional attitudes or intentional states, a question upon which opinions vary widely. However, I need not concern myself with this debate here since, if there are mental properties which are not caught in the Davidsonian predicament – that is, some mental properties are not propositional attitudes – there may be independent reasons for maintaining that these are also essentially different from physical properties. One may argue, for example, that physical properties are essentially spatial, while mental properties are essentially not[44]; or, that perceptual experiences manifest phenomenal properties or qualia[45] or, more generally, that *all* occurrent conscious events do.[46] Alternatively, intentional states may be characterised as goal directed, functional entities (perhaps of a similar type to some biological categories), where some non-causal, or non-dispositional account of proper functions is given.[47] These latter two proposals are compatible with the presence or absence of nomic connections between mental and physical properties, and so with the Principle of Mental Anomalism. One could maintain, for example, that qualia (say) are nomically related to physical properties, but are irreducible to them in principle.[48] Or, provide an account of how the ontology of proper functions can be accommodated within the causal structure of the world in general, without the individual kinds of intentional state being reducible to physical properties.

5.10 Event Causation, Natural Properties and the Principle of Mental Anomalism

As in the case of the Completeness Thesis, I shall not pause to evaluate arguments in favour of mental properties being anomalous with respect to physical properties, since I have already considered the philosophical positions available for those event theorists who deny the Principle of Mental Anomalism. Accepting this principle permits the event theorist to provide a distinctive account of the nature of the relationship mental and the

[44]McGinn (1995).
[45]Peacocke (1983), Lowe (1995; 1996).
[46]Flanagan (1992, 67-8).
[47]Papineau (1993, ch. 1-2), Millikan (1984; 1993 and *passim*).
[48]Chalmers (1995).

physical from that of the property theorists, since the token identity of mental causes and effects with physical events is entailed by this in conjunction with the Completeness Thesis and the Principle of Causal Interaction. Indeed, as Tim Crane has pointed out, the event theorist does not actually require the Completeness Thesis as an explicit premise in her argument for this entailment to obtain, since the fact that physics is complete is itself entailed by the Principle of Mental Anomalism in conjunction with the weaker Cause-Law Thesis which characterises the relation between singular causation and general nomic connections and causal laws.[49] If every instance of singular causation is covered by a causal law, and mental and physical properties do not relate nomically, then the nomically related properties must be physical ones, even in cases of mental causation.[50] The correctness of this observation depends, of course, upon whether the Principle of Mental Anomalism can be defended without invoking the fact that the physical is a comprehensive, closed system, while the mental is not; and furthermore, that the Cause-Law Thesis does not depend on this fact either. Otherwise, the Completeness Thesis will have made a surreptitious entrance into the argument at an earlier stage and will require independent defence. This point about the structure of the argument will become relevant later; so, having noted it, I shall move on.[51]

This account of causation initially looks promising: a minimal form of physicalism can be defended, since particular mental events are identical with particular physical events; and mental events can be causes and effects, so the phenomenon of mental causation can be accommodated. However, this initial promise turns out to be illusory, since the theory is subject to two serious objections: firstly, that it amounts to epiphenomenalism about the mental; and secondly, that the Cause-Law Thesis and the Principle of Mental Anomalism are inconsistent with Token Identity. When considered separately, these objections present a serious enough threat, but taken together they add up to a devastating combination, the problem being that if this account of event causation can deal with the first objection, it hopelessly falls prey to the second. It seems unlikely that it will be conceptually possible for the event theorist who adopts a realist construal of properties (at least, for physical properties) to simultaneously reply to both objections in a satisfactory way, and thereby provide a plausible account of mental causation.

[49]1995, 217.
[50]The account of mental causation with which Crane is concerned is Davidson's Anomalous Monism (1970a), but the point is applicable to accounts which accept the realist construal of properties also.
[51]See 5.12.

5.11 The Epiphenomenalist Objection

The epiphenomenalist objection charges that two of the principles upon which this account is founded – the Principle of Mental Anomalism and the Cause-Law Thesis – are inconsistent with the Principle of Causal Interaction, the intuitive assumption that the mental causally interacts with the physical.[52] It draws upon the point, noted above, that when particular events cause one another they do so in virtue of some of their properties and not others, and also that it is plausible to assume that it is in virtue of these properties – the causally efficacious ones – that a singular causal sequence instantiates a nomic connection and falls under a causal law.[53] Every sequence of mental causation will instantiate a nomic connection and thus be covered by a causal law but, because of the Principle of Mental Anomalism, the nomic connections will relate physical properties and the law will be a law of physics. If causally efficacious properties are identical with those which generally produce a certain type of effect and thereby instantiate a nomic connection, then the efficacious properties of a mental cause cannot be the mental ones; causally efficacious properties are always physical, and so the mental is epiphenomenal. It was not in virtue of my being overly anxious that I was impatient with the cat, for example, but in virtue of the depleted noradrenaline and serotonin levels in my brain. My mental properties had as much to do with causing my action as the beauty and elegance of protein molecules have to do with causing them to fold: the concrete particular causes and effects may exemplify mental or aesthetic properties, but the having of these properties is not why those concrete particulars enter into the causal interactions that they do.

Although the event theorist might insist that concrete particular events, and not properties, are causes and effects, it does not seems that she can justify her insistence in this matter given the realist construal of properties in play. Concrete particular events have an objective qualitative structure which corresponds essentially with their causal powers, the propensity to cause certain kinds of events. 'Events causing their effects *in virtue of* certain properties' has a constitutive ring to it, implying that the properties govern event causation or are constitutive of the event being a cause. If the world is divided into distinct causally efficacious properties, then one cannot maintain that concrete particulars cause each other holistically – in virtue of *all* their features – but only

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[52]See, for example, Honderich (1982, 1983, 1984) and Robinson (1982, 8 - 18). Honderich erroneously thinks that his argument is directed against Davidson's anomalous monism. It misses that target because the conception of properties required for the objection to work is not one to which Davidson would subscribe (see Davidson (1993)). However, since Honderich's conception of properties is closely enough related to that the event theorists under consideration have adopted to account for causal explanation, his epiphenomenalist objection does have relevance for this account of mental causation.

[53]This is especially uncontentious when the nature of properties is construed as being wholly determined by the roles they play in nomic connections, as discussed in Chapter Two.

in virtue of some of them, and the closed system of nomically related physical properties preempts any other families of properties being causal efficacious.

The event theorist might try to reply here that the import of the Principle of Mental Anomalism is that there is just no fact of the matter which abstract particular physical features of the world, or property-instances, our mental predicates pick out, and thus remain unconvinced that the charge of epiphenomenalism is warranted.[54] This seems to be a precarious path to adopt, however, especially in light of the discussion in Chapter Two which concluded that it makes no sense to talk of a qualitative difference between a property and its particular instances. Nevertheless, there may be some workable strategy here, by which the epiphenomenalist object can be waylaid. However, the event theorist ultimately finds herself in an untenable situation: if the causal efficacy of mental properties can somehow be vindicated, the event theorist becomes all the more vulnerable to another objection that the Token Identity theory must be false.

5.12 The Mereology Objection

Presuming that the event theorist can deal with the charge of epiphenomenalism and uphold the causal efficacy of mental events, *qua* mental and not merely in virtue of their physical properties, she immediate faces another difficulty. Following Hornsby, I will call this the *mereology objection*, so named because it claims that Token Identity requires a certain conception of events – the mereological conception – which conflicts with that required by the Cause-Law Thesis on this account of natural properties and event causation.[55] This conflict is exacerbated by the Principle of Mental Anomalism and the successful defence against the epiphenomenalist objection. Once the causal efficacy of mental events has been vindicated and the Cause-Law thesis defended, there is negligible reason to think that physical particulars exist with which particulars instantiating mental properties can be identified.

The difficulty arises because the argument for token identity says more than it initially appears to: not only is every mental particular identical to a physical particular – a particular event – but, by the Cause-Law thesis, that physical particular falls under a causal law as a physical type or kind, in virtue of its natural, physical properties. Thus, mental events must be identical to particular physical events where these are understood according to the richer conception of particular events, which results from the causal picture of particular events and objects being causes and effects in virtue of their natural properties. The mereological conception of particulars which accepts, at the very least,

[54]See, for example, MacDonald (1989, 159 - 164).
[55]This objection has been raised by Scheman (1983) and Hornsby (1985), although I have set it up somewhat differently.

that any fusion of concrete particulars is itself a concrete particular[56] will have to be denied in this case, since *bona fide* physical particulars are as sparse as instances of natural properties. The theory of sparse, natural properties adopted by the nomological event theorist explicitly precludes just any arbitrary region of space-time counting as a bona fide physical particular event or object.[57]

So the Token Identity thesis appears to amount to more than the minimal physicalist claim that was promised: the particular physical events with which mental events are identical are among the elite few concrete particulars which exemplify sparse natural properties. For the sake of terminology, call concrete particulars under this richer conception *'relevant'* particulars, since they are particulars which are essentially of some or other natural kind.[58] Since the Principle of Mental Anomalism denies that there can be any nomic connection between mental and physical properties, each instance of a mental event of a specific type will be identical with a physical event of a different type from the other instances. Each particular physical event identical to an instance of believing-that-it-is-Thursday, for example, will exemplify a *different* physical property, and thus will each be nomically related to other kinds of physical events in different ways. What appear to be unified causal laws on a psychological level are underwritten by an unruly variety of lower level nomic connections which link an unpredictable selection of physical properties.

This alone is perhaps not too much of a problem for this account of mental causation, but what is really surprising is that these spatio-temporally individuable physical particulars should belong to natural or physical kinds at all; that is, that every one of them should be a relevant physical particular, rather than some bizarre mereological fusion. In the absence of isomorphism between mental and physical properties, which is guaranteed by the Principle of Mental Anomalism, there seems to be no reason to believe there should be any isomorphism between the relevant particulars of each domain. The non-mereological ontology of relevant particulars compatible with this account of causation and required by the defence of the Cause-Law Thesis makes the Token Identity thesis look manifestly implausible, especially once the event theorist has successfully dealt with the epiphenomenalist objection and established that mental properties and events are indeed causal.

Consider a couple 'higher-level', non-psychological concrete particulars[59], an object and an event: the University of London and the premiere performance of Stravinsky's *The*

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[56]See Hornsby (1985) and MacDonald (1989, 169) for a more technical explication of this notion.
[57]See 5.6.
[58]See 5.6.
[59]For convenience, I will adopt the familiar hierarchical metaphor of 'higher-level' and 'lower-level' kinds and properties, without granting it any philosophical import.

Rite of Spring (say). Although these are obviously physical particulars in the meagre, spatio-temporal sense, they are going to be particulars of which we have little idea how they could be of a physical or perfectly natural kind; that is, how they could be *relevant* physical particulars. How could we go about specifying what kinds these particulars were in physical terms, and thus what their natural properties were? Does the University of London include the buildings of the University of London; the people in it (teaching staff only? students and staff? students, teaching staff, cleaners, technicians, catering staff and anyone else who works here?); and presuming we sorted that matter out, do we include the lunch they might have just had as well? Even if such questions are in principle answerable, there appears to be very little reason to think that this very complex fusion of particular physical objects (which each instantiate natural properties) is itself a physical kind. Similarly, when the premiere performance of a piece of music is construed as a particular physical event: do we include only the performance of the orchestra, or the tuning up beforehand, the audience, the drinks they had beforehand? And so on. Even if a physical particular such as this is in principle specifiable, it doesn't seem as if the particular which is specified will be a *relevant* physical particular, rather than one of the abundant, arbitrary spatio-temporal regions which randomly cut across the natural divisions in the world. But if these higher level concrete particulars are genuinely causal – and the premiere performance of Stravinsky's *The Rite of Spring* caused a riot – then the Cause-Law Thesis says that, *as physical kinds*, they will fall under a (strict) causal law.

So what of the physical particulars with which mental events are supposed to be identical? It seems that these physical particulars will be as bizarre in physical terms as the symphony and the university, especially if some form of externalism is true and some mental events – certain propositional attitudes, for example – are partially constituted by circumstances which obtain outside the subject's body. The Principle of Mental Anomalism specifically precludes mental properties being in nomic connection with physical ones, so it seems absurd to think that the physical properties exemplified by those physical particulars with which mental events are identical will be related to perfectly natural properties in a suitably simple way, that is, that they will be natural properties. There appears to be no more reason to expect that mental particulars will match up with physical particulars of *any* natural kind than there is to hope for type-type correlations between the two domains. As Scheman remarks, 'The apparently innocent offer of token identity turns out to be the decisive move in [a] conjuring trick' to ensure the truth of monism; this extremely weak version of physicalism seems eminently plausible, but it is only tenable on a conception of particulars that is incompatible with the account of sparse properties and event causation.[60]

[60]1983, 7.

If the Cause-Law Thesis could be independently grounded, *without* denying the mereological conception of events, then the Token Identity claim implied by it (in conjunction with the Principles of Causal Interaction and Mental Anomalism) would give some reason to regard the physical particulars with which *mental* events are identical as a special case of the mereological conception of events being correct in physics.[61] Perhaps the event theorist could point out that one plausible reading of the Cause-Law thesis is that it is true of *micro*-physical properties and event-types, whereas macro-physical events, such as avalanches, explosions and car crashes are covered by the Cause-Law Thesis in virtue of their being constituted by micro-physical event-types. Hence, some fusions *are* countenanced, the mereological conception of events is not always false. But there seems to be no way in which relevant fusions can be distinguished from non-natural ones, aside from their being nomically, or definitionally related to perfectly natural properties which, in the case of mental properties, the Principle of Mental Anomalism rules out. Without this distinction, the mereological conception of particulars is hopelessly at odds with the nature of nomological event causation, if the fusion of *any* collection of relevant particulars is itself a relevant particular, then nomological causal relations become overabundant again. The alternative proposal to uphold the plausibility of the Cause-Law thesis relying upon the mereological conception of events immediately conflicts with the richer conception of events being required by the account of causation involving an ontology of concrete particulars and natural properties.

It appears that this version of event causation with sparse natural properties cannot sustain *both* the causal efficacy of the mental against the epiphenomenalist objection and the Token Identity thesis against the mereological objection; this theory either has no account of mental causation, or of the relationship between the mental and the physical. Moreover, success against the former criticism makes it all the more likely that the latter will stick. This is clearly not an acceptable situation, especially when alternative accounts of the metaphysics of causation may fair much better in this regard. I conclude that the event theorist would do well not to struggle with the problems created by the adoption of the realist construal of properties; there seems to be no plausible amalgamation of the accounts of properties and causation between concrete particulars. If event causation is to provide a plausible challenge to property-based causation, then an account of properties or kinds is called for which moves away from those considered so far.

[61]MacDonald makes a similar point (1989, 183), but also fails to find such grounding.

5.13 Biting the Bullet: Event Causation and an Alternative Account of Properties

The project of explicating a theory of properties which does not require a primitive ontological assumption asserting that nature has qualitative joints marking objective similarity and difference, or that the natural world is objectively divided into sparse, perfectly natural properties, is one which has rarely been explored in the philosophical literature,[62] although it is sometimes implicitly accepted.[63] The denial of the existence of natural properties and nomic connections, or of an objective standard of similarity and difference, is common enough[64]; but those who adopt this position are usually content with making linguistic or conceptual schemes – the ascription of predicates to concrete particulars and the confirmation of sentential causal laws – or extensional classes[65] do the causal-explanatory work alone.[66] Here I shall attempt to sketch an alternative theory of properties without drawing upon the Natural Properties Principle – call it a '*Cautious* Property Theory' – and assess its plausibility with respect to the current problem of mental causation.

I shall not investigate the purely linguistic or extensional set-theoretic variants, however, since I believe that talk of predicates cannot do all that is done by talk of properties. On a similar theme, Hacking suggests:

> Quine and others write of conceptual schemes, by which they mean a body of sentences held for true. That is, I think, a mistaken characterisation. A conceptual scheme is a network of possibilities [embedded in various styles of reasoning], whose linguistic formulation is a class of sentences up for grabs as true or false.[67]

If this re-characterisation is somewhere near the mark, then it fits very neatly with the set-theoretic conception of properties as entities to be identified with the sets or classes of their instances in this and other possible worlds discussed in Chapter Two.[68] The difference here is that the range of possibilities is not a purely objective matter and therefore fixed, but can and does evolve.

The starting point for this account is to accept the classificatory sceptic's argument that, even granting that a unique set of nomically related, perfectly natural properties

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[62]One exception being Taylor (1993).

[63]For example, by Scheman (1983), Elgin (1995). It seems that Davidson might also accept a similar account of properties, although this is difficult to discern as he mentions properties so rarely (1993, 1995); it is more usually presumed that he refuses to countenance such entities at all. Although the account of event causation proposed in this thesis is Davidsonian in flavour, the account of causal explanation and theory-dependent properties to be presented diverges from any that Davidson has expressed and may even be inconsistent with his view (see 5.13.1).

[64]For example Goodman (1970), Quine (1969b).

[65]Quine (1981 and *passim*).

[66]Those who hold this position include Goodman, Quine and Davidson.

[67]1983, 71, where he draws from Hacking (1982, 48-66).

[68]See 2.3.

exist, such entities are ultimately of no theoretical use outside pure metaphysics, since the likelihood that the kinds and laws as they are classified by both science and language correspond to these objective natural properties and nomic connections is vanishingly small, and there would be no way of knowing if this was the case. This is not only true of our currently incomplete science, but also of some hypothetical completed theory which explains all the causal interactions of the world. Our epistemic situation with regard to the objective joints of nature is remarkably weak.[69] As was seen in Chapter Three, the property realist may sustain his theory of properties against such criticism either by investing heavily in the success of the scientific realist project to disarm one or more of the premises in the classificatory sceptic's argument, or by presupposing that we *do* have epistemic access to the ontology of sparse natural properties because these are more eligible than non-natural ones to figure in the content of our thought.

The remaining alternative to these strategies is to embrace the classificatory sceptic's conclusions and admit that range of natural properties and nomic connections is not only dependent upon the objective causal features of the world, but also upon their having a place in a specific theory; that is, upon human systems of classification and generalisation. This need not result in a version of untenable property egalitarianism however, since there is room for an elitist distinction or hierarchy of properties; some of the predicates of any specific theory are more primitive than others. Taylor proposes that the 'predicates playing the more central and fundamental classificatory roles with [a theory] T' are the most 'cosy' relative to a theory T, with other predicates having a degree of cosiness rated according to the simplicity of their definition in terms of primitive predicates, and the cosiness rating of those predicates.[70]

Properties and nomic connections are '*theory*-dependent' entities on this view, the distinctions between properties lie where they do in virtue of the relations they bear to other properties referred to by predicates of the theory, rather than in virtue of their corresponding to objective qualitative divisions in nature. However, since the theory is developed and confirmed by observing and intervening with the causal interactions of nature, the inter-dependent system of properties and nomic connections is not merely an artefact of the human mind, nor do the causal features of the world spring into existence if and only if our theory has a predicate for them. The qualitative divisions *between* properties are dependent for their existence upon the theory, so the causal features of the world can only be individuated relative to a theory, but the causal features of the world which our theory attempts to capture are not. With the requisite adjustment and correction, a complete causally closed theory is possible in principle, which would

[69]See 3.5 - 3.11.

[70]See Taylor (1993, IV). This, of course, allows him to talk in terms of 'T-cosy properties', but I will attempt to avoid this terminology, for fear of making a bad joke worse.

provide complete coverage of all the causally efficacious features of the world. But, since the classificatory sceptic maintains that such a complete theory is one of many possible ones, the primitive predicates of this theory could not be construed as referring to the objective joints in nature, should such divisions happen to exist.

Because truth is measured by the success of a theory in prediction and explanation on this view, and many such successful, completed theories are possible, there is, as Elgin points out, a legitimate sense in which 'truth is cheap'; the truth of a theory is no longer dependent upon the primitive predicates within it referring to a sparse set of perfectly natural properties.

> For philosophy of science, the important lesson... is that we cannot construe (mere) truth as the end of scientific inquiry. Not, as the skeptic contends, because truth is too hard to come by, but because it is too easy.[71]

There are as many true complete causal theories as there are strange permutations of a completed version of our fundamental physical science. The question of whether a theory should be preferred over its rivals cannot, therefore, be settled on the basis of whether or not it is true, but by its fulfilling certain desiderata or theoretical virtues, which cannot in turn be justified by appeal to their being conducive to getting truth. The concerns of the scientific realist project have given way to questions about 'what sort of understanding science, or some particular science, is or ought to be after – that is, about what desiderata it does, or ought to accept.'[72] Thus, the attribution of properties to particulars within an inter-dependent system of classification and generalisation is governed by theoretical constraints or constitutive principles, where different theories may involve differing constraints: while physics seeks universal generalisations or exceptionless laws, for instance, geology may be content with singular causal explanations of particular events.

It remains an open question whether there are any determinate objective distinctions between these causal features; that is, whether some version of the Natural Properties Principle is correct. I think agnosticism is the best policy here, since it now makes no difference to the theory of properties whether the world has objective joints or not. On the one hand, the truth of a theory is independent of whether its primitive predicates refer to objectively existing perfectly natural properties, but is measured by its success in prediction and explanation. It does not matter to science whether the world comes neatly and readily sorted according to an elite, determinate set of natural kinds, or operates according to a determinate set of nomic connections. The truth of the Natural Properties Principle thus need have no bearing upon philosophical conflicts between the taxonomies of different areas of discourse, such as between folk psychology and physics, for example. Nevertheless, it seems plausible to presume that, although the classifications and

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[71] 1995, 301.
[72] 1995, 301.

generalisations in our theory develop and thereby which properties there are gradually alters, the later theories attempt to predict and explain – or explain away – roughly similar phenomena, or paradigm effects.[73] Physics, for example, has shifted from scholastic talk of 'celestial matter' and 'earthly matter' and 'heaviness' and 'lightness', to a Newtonian conception of 'mass' and the 'force of gravity', and then on to an Einsteinian theory in which mass is proportional to energy and gravity is no longer construed as a force at all.[74] Although this theory change transforms which properties exist, it seems that the existence of these theory-dependent entities is being postulated to generalise over and explain roughly similar phenomena, such as the common-sense observation that unsupported objects tend to fall towards earth, although the moon, stars, planets and clouds do not.

5.13.1 On the Very Idea of this Cautious Realism

This attempt to give cautious property theory some weakly realist grounding is not to invoke a contentious distinction between scheme and content of the type attacked by Davidson, since there is no gap between thought and the world; the theory does not act as an *intermediary* between us and some unconceptualised given.[75] Such views are generally considered to be incoherent since, as Rorty and Davidson argue, such distinctions require a notion of 'the world' as used in a phrase like 'different conceptual schemes carve up the world differently' which is the notion of 'something completely unspecified and unspecifiable – the notion of a thing in itself, in fact.'[76] Rather, as Baghramian has recently suggested, we can avoid the incoherence and accommodate the innocent intuition that there are 'different ways of conceptualising our lived experience in the world', by framing a slightly different scheme-world distinction.[77] Following William James' and C I Lewis's distinction between 'the thick experience of everyday life' which they contrast with 'the thin experience of sensation', a distinction can be drawn between our inter-subjective theory, or conceptual scheme, and our 'thick experience' of the world of which we ourselves are a part.[78] We can have 'direct contact with the world or reality'; on this view, the conceptual scheme or theory via which we taxonomise and generalise about the world does not act as an intermediary, so we do not require a notion of 'the world' as 'something completely unspecified and unspecifiable.'[79] Although the

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[73]See Papineau (1993), Spurrett (1999, ch. 1).
[74]Hall (1963, 280-1), Russell (1925, ch. 13).
[75]1974b.
[76]Rorty (1982, 14).
[77]1998, 304.
[78]In light of this, cautious property theory does not conflict with the account of the perception or experience of causation which was invoked to prevent the collapse of theory-independent event causation due to a version of classificatory scepticism (see 5.4). A more substantial theory of perception is required, of course, which is consistent with this exposition of the ontological status of causation and the referents of the predicates of our theories.
[79]1982, 14.

individuation of the causal features of the world in terms of properties and nomic connections is dependent upon a theory, to which our human conceptual apparatus makes a substantial contribution, 'the world is not created by our conceptual goings-on'.[80] Thus, as Baghramian puts it, 'we need not deny the role of the world in our conceptualising' and 'fall prey to the greatest excesses of idealism'[81]; the suggestion that properties and nomic connections are theory-dependent is not make them *mind*-dependent, but it does acknowledge that how we divide the world may have nothing to do with carving nature at its joints.

If the notion of our thick experience of the world can be defended in a satisfactory way, the rejection of the realist construal of properties does not challenge the issue of whether the fabric of the world is actually there, whether what we experience and theorise about exists, is 'real' or not. In fact, it explicitly claims that it is. There is still room, therefore, for a species of internal realism about properties and nomic connections: from within the confines of an evolving theory there is no bar to regarding the kinds of entities it relates, and the relations between them, as real (whatever that means), but the ontological point remains that whichever kinds and laws our theory contains exist *relative* to that theory, a system of classification and prediction, as a whole. The supporter of this kind of internal realism might also suggest that the apparent plausibility of natural properties or genuine universals existing independently of us arises from the realism with which we may regard them from *within* a system or theory; objects have weights, masses and colours because weights, masses and colours have roles within our system of laws, and the truth of our system of laws and of singular causal claims is dependent on our having made 'right' attributions of properties to objects. But this internal realism does not shift the conclusions of Classificatory Scepticism; we have no entitlement to claim that our kinds and laws are correlated with natural properties, existing independently of us and the way in which we pick them out.

5.13.2 Moorean Facts (Again)

In addition to the worry above that this account of the ontological status of properties and nomic connections might make illegitimate use of an unworkable distinction between scheme and content, there is also the question of whether it can accommodate the Moorean fact of apparent sameness of kind. Certainly, we can explain how an ontology of theory-dependent properties permits folk expertise in such judgements for all those competent in the language of the theory, since competent language use and the activity of classification are part of an inter-related enterprise. Thus, this conception of properties does not require the services of the additional

[80]See Haack (1996, 306).
[81]1998, 302.

epistemological presupposition invoked by the realist about how we gain knowledge about such entities.[82]

But these are judgements of qualitative sameness *relative* to a system of human classification and this, Armstrong and Lewis might respond, is incompatible with what we *mean* when we make a judgement that two particulars are of the same type. We mean that they are of the same type in some non-perspectival, objective sense, and not that such judgements are true or false only relative to a theory. Taylor suggests that the cautious property theorist can avoid this complaint, however, since Lewis and Armstrong have misplaced the *objectivity* of judgements of sameness of type as being part of the core Moorean meaning of such propositions – that is, how ordinary, competent folk understand them – rather than as part of a proposed *analysis* of such propositions, which is, like all philosophical proposals, 'highly controversial, difficult to discover, the subject of legitimate doubts of philosophical theorisers.'[83] A recurring theme of this thesis has been that there are legitimate doubts about the objectivity of our judgements of sameness of kind, and that we should explore the consequences of living with such scepticism for our philosophical accounts of causation and the mind. The argument over this issue is not likely to fade, however, so I will accept that Taylor's proposal is as least as plausible as Armstrong's or Lewis' suggestions, and move on to examine how the conception of properties as theory-dependent entities fares when applied, in conjunction with the account of causation between concrete particulars, to the philosophy of mind.

5.14 Theory-Dependent Properties and Mental Causation

Rejecting the realist construal of properties involves rejecting the idea that concrete particulars have an objective fine-grained structure of property-instances or tropes. This is not, however, to construe concrete particulars as bare particulars, as Armstrong points out:

> For one who denies the existence of properties *in re* (whether these properties be universals or particulars), particulars are a sort of structureless blob. They can have parts. Predicates can be hung on them, concepts applied to them, they can be herded into classes... but they lack real, internal structure.[84]

However, this does have implications for how particular objects and events enter into singular causal relations: a particular event cannot cause its effect *in virtue of* certain properties and not others, where the 'in virtue of' is cashed out as a constitutive claim that the properties of a particular govern the types of effect it can have. Theory-dependent properties and nomic connections constitute the explanatory ontology, postulated to say

[82]See 3.9.
[83]1993, 92. Also, see Moore (1959, 37).
[84]1980, 110.

why an effect occurred and imposed upon the causal ontology of concrete particulars, but they make no difference to the fact *that* an instance of causation occurred. Whether, in any specific instance of singular causation, a certain property can be attributed to the cause is drawn, as Hume would say, 'from circumstances foreign to the cause', since it is determined only relative to a theory, to how properties are attributed to other particulars in order to classify and generalise about singular causation. Talk of properties or nomic connections makes no sense except relative to a larger system of classification and generalisation, and it is impossible that these two tasks be divided. In attributing a property to a particular, we do not refer to an objective, fine-grained entity *simpliciter*, but denote an attribute of that particular in virtue of which it stands in certain relations with other particulars. The nature of properties is determined by their role in laws, but the truth of the laws can only be judged in relation to the success in attributing the properties. Success in property attribution or classification can only be measured against the success of the laws in prediction and explanation, and our ability to discover laws is dependent on our being able to classify entities in a certain way.

The upshot of this is that, although we may presume that a cause has the effect that it does in virtue of something about it, some features that it has, particular events cause each other holistically. There is no fact of the matter about which of the properties attributed to the particular cause are attributed in virtue of the features of that particular which are causally efficacious and which are not. Thus, the completeness of physics can be no danger to the causal efficacy of the mind, since there is no threat of causal overdetermination: when a particular thought of mine causes a particular action it does so in virtue of the unindividuable causal features it manifests, not in virtue of its physical, nor its mental properties; it does not cause the action *as* physical, or *as* mental, at all.[85] When causation is construed as a theory-independent phenomenon between particular events, this is true whether or not the Principle of Mental Anomalism holds, such that mental properties are essentially different from physical ones and cannot be in nomic relations with them.

5.15 The Threat of Explanatory Epiphenomenalism

However, in the wake of this modest success, another version of the epiphenomenalist objection looms: while mental properties are not epiphenomena on the causal level, because all or no properties are (the question just does not make sense), the possibility remains that we might formulate a system of laws which accounted for all the happenings in the world and yet mental properties be completely left out. Since the properties within a hypothetical, complete physical theory would provide complete

[85]Davidson (1993, 6). Also, see Bunzl (1979).

coverage of all the causal features of the world, there is still space to invoke the epiphenomenalist objection against the *explanatory* efficacy of the mind and mental properties. As far as causal explanation goes, we would have all the explanatory ontology we require in the physical system; there would be no explanatory gain to be had in talking about the mind.

I have argued that the original worries about the causal efficacy of mental properties were based on an untenable, realist construal of what sort of entities properties can be, but this new difficulty cannot so easily be explained away. If every instance of causation can be subsumed under a law in which mental properties do not figure, the classification of some particulars as mental entities may become superfluous and mental discourse obsolete. If there is no requirement to refer to mental properties in the course of predicting and explaining human behaviour, then mental properties could be eliminated from the over-populated theoretical ontology on grounds of economy, simplicity or parsimony. From the point of view of understanding and accounting for whatever goes on in the world, talking in terms of mental properties such as beliefs, desires, experiences and thoughts, would be an unnecessary indulgence.

The problem of finding a place for the mind in the world, in a way which accords with our pre-theoretical intuitions about the mental, has been shifted from the question of how mental causation is possible to one concerning the dispensability of mental explanation. Since the description of particular causes and effects really does not matter, we could as well use the taxonomy of witch theory, or alchemy, or bodily humours to pick out causally efficacious events, without this mattering at all to the causation occurring. On the other hand, such taxonomies are widely regarded as useless from the point of view of explanation (at least from the perspective of most Western European thought), so the sense in classifying any particular according to any kinds from these taxonomies is extremely questionable. If mental properties are superfluous, then picking a particular event out as a certain thought (say) is on a par with calling it 'anatiferous'[86]: that it *is* an event of that kind is irrelevant, since it has no explanatory role in virtue of being that kind. If this story of alchemy and witch theory is analogous to the one which should be told about mental properties, then the suspicion persists that the problem of mental causation has been relocated, rather than alleviated. Our intuitions about mental properties genuinely explaining actions – that what we think explains, as well as causes, what we do – would prove to be incorrect.

[86]Meaning 'producing ducks or geese, that is producing barnacles, formerly thought to grow on trees, and dropping off into the water below, to turn into tree-geese' Johnson's *Dictionary* (1755) and *The Oxford English Dictionary*. This example is discussed by Hacking (1983, 70).

However, this epiphenomenalist or eliminitivist conclusion does not follow immediately from the discussion so far, since there is an account of explanation available to the event theorist which guards against this objection, and it does so all the better if the Principle of Mental Anomalism is true. Firstly, one could maintain that the availability in principle of a complete causal explanation in physical terms need not exclude explanations in non-physical terms, which may provide simpler and less heterogeneous generalisations than those in terms of fundamental physical properties. On this account of properties, the conception of reduction in play is theoretical, rather than ontological, and there may be good reasons why one area of discourse should not be integrated, or reduced, to another even if the kinds within them co-vary. As in Putnam's famous example, one can more easily explain why a square peg 5 cm wide will not go through a round hole 5 cm in diameter in terms of everyday high level predicates than in micro-physical terms[87], and the reduction of thermodynamics to statistical mechanics does not stop people talking about 'temperature' both in everyday and scientific discourse. For the completeness in principle of physical theory to pose any threat to our ordinary folk psychological discourse, physical explanations of human behaviour would have to be at least as simple as the mentalistic explanations they replaced, which intuitively seems extremely unlikely.[88] And, in the unlikely event that physical explanations of behaviour were as simple, then it would be difficult to see how the elimination of explanation in psychological terms would constitute any great loss.

The event theorist has an even stronger case for denying that the mental will turn out to be explanatorily epiphenomenal, if she also maintains the Principle of Mental Anomalism. If the existence of a family of properties is dependent upon a distinct system of classification, or area of discourse from the physical one – that is, the properties are attributed according to incompatible constraints – then there is no fact of the matter whether predicates from each of the respective systems are classifying particulars on the basis of the same features or not. There is simply no basis for comparison of the features of particulars that predicates pick out, except *within* a system of classification, and the incompatibility of systems of classification at least partially consists in the impossibility of nomic connections, and therefore of bridge laws, between them: the kinds of each theory simply do not match up. In this context, this no longer need be an issue of comparison between our present system of classification and some bizarre, hypothetical gruesome classification which could in effect replace the family of properties that we regard as natural or physical; rather, it concerns the possibility that there *are* families of properties – mental properties, for instance – which are attributed according to constraints which differ from those according to which paradigmatically physical,

[87]See Putnam (1978).

[88]Unlike the property realist, the cautious property theorist is not committed to any objective standard of simplicity with which our intuitions on such matters may clash. See 3.14.

causally individuated properties are attributed, creating areas of discourse which are distinct from physical theory and yet coexist with it.

It is important to note here that, since property dualism concerns nothing more than the existence of different ways of classifying the world, rather than the existence of different species of substantial entities, no conclusion is implied about substance dualism – the existence of distinct mental and physical substances – from assertions that families of properties may differ in kind, that is, that they are attributed according to incompatible constraints. A particular event which may be classified according to the constraints of one taxonomy does not belong essentially to that taxonomic system alone and is not thereby disbarred from being brought under a description according to the constraints of a conflicting system of classification. Indeed, if the Cause-Law Thesis holds, then the particular events involved in each and every singular instance of causation may be attributed physical properties according to which they fall under a causal law, such that events which are picked out according to a non-physical description and are nevertheless causal will also have a physical description, they will be eligible to be picked out in terms of physical properties or kinds. If this picture is tenable, every particular which is a cause will be identical with a physical particular, no matter the classification system within which it was initially described, permitting the nature of the relationship between the domains of the mental and the physical to be explicated: Token Identity, or token physicalism, will hold.

5.16 More Mereology and the Defence of the Cause-Law Thesis

Two inter-related issues must be clarified before the on-going examination of the plausibility of this account of event causation and theory-dependent properties can be concluded: firstly, whether the Cause-Law Thesis can be defended; and secondly, whether this defence is able to avoid the conception of particulars which would make it incompatible with the Token Identity thesis, leaving this version of event causation as susceptible as the last to the mereological objection.[89]

Prima facie, any account of causation which maintains the distinction between the theory-independent ontological status of causes, effects and causation on one hand, and the theory-dependence of the explanatory ontology of properties and nomic connections on the other, gives no indication of why it should be true that every instance of singular causation is subsumed under a general causal law. If, as this cautious theory of properties contends, the world betrays 'no semantic preferences'[90] objectively speaking, then there seems no good reason to suppose that it betrays any preferences for an ordered

[89]See 5.12.
[90]Putnam (1984, 5).

nomologicality with respect to the causation which occurs. If an event does not cause another event in virtue of having certain properties, then there seems no basis for the claim that, once properties are attributed to the particulars involved, there will be a property of the cause and a property of the effect which are nomically related; that is, that the particular sequence of singular causation will be covered by a law. The Cause-Law Thesis is not derivable from the nature of causation alone, as it is within essentially nomological accounts of causation. The point here is not an epistemological one, the question is not whether we can find a causal law which covers the particular case, but whether there is (or could be) such a law. On this account of causation and explanation, there is no *a priori* guarantee, it is claimed, that the relationship between instances of singular causation and laws is a universal one, singular causal instances might occur which are not covered by any causal law.[91]

The account of event causation supplied so far appears to leave open the possibility that some singularist account of causation is true, which denies any connection between singular sequences of cause and effect and general principles which capture similarities over many such cases. But this, taken across the board, seems highly counterintuitive. Not only would this suggest that all but a handful of philosophers of causation have been utterly mistaken, but it also conflicts with much of our experience of causation. Many, even most, everyday instances of singular causation are covered by generalisations, albeit not strictly lawlike generalisations in a Davidsonian sense, which serve us well for explanation, prediction and the direction of our own actions.[92] (Drop this thesis on your foot – it will hurt.) Surely all this, and the success of causal laws in science, cannot be a matter of pure coincidence?

In keeping with the strong intuition that all this is *not* a matter of pure coincidence, this account of event causation can rule out the possibility that a case of singular causation could occur which is not covered by any law. However, unlike the accounts of causation considered previously, the justification for this view does not arise out of the nature of causation, but from the nature of physical theory, the very possibility of there being a causal-explanatory theory accounting for the causal interactions of the world. Thus, in contrast to the broadly 'Humean' defence of the Cause-Law Thesis[93] invoked by those who adopt the realist construal of properties, the support for this view has a Kantian flavour; the truth of the Cause-Law Thesis is required in order to have a theoretical system of causal classification and generalisation at all. The principle that every case of singular causation is covered by a law is correct because at least part of the enterprise of property attribution, and thereby the delineation of what counts as

[91]See, for instance, Anscombe (1971), Ducasse (1926), Burge (1992, 35), Hornsby (1981, 86).
[92]Davidson (1970a; 1995).
[93]Scare quotes are optional, depending on your interpretation of Hume.

similarity and difference, is inextricably linked with the task of formulating and confirming causal laws. The Cause-Law Thesis is a principle embodied in the nature of physical theory, constitutively governing the evolution of a theoretical project to classify the world in order to formulate laws for prediction and explanation.

We attribute properties to particulars and sort events and objects into kinds in order that they *do* fall under universal causal laws; should no causal law be forthcoming to cover a case we adjust, or add to the taxonomy of properties or kinds until such a law can be formulated. Furthermore, should an apparent singular causal claim entail a universal generalisation which is in conflict with the entities or kinds within a classification system (and other laws of the current theory), we adjust the way in which change (or relevant change, at least) is defined, which alters which entities call for causal explanation. The success of a system of classification is measured by its success in prediction and explanation – (often, but not exclusively) the laws or regularities it implies – and, in physics, a virtue and predominant interest of the system is the formulation of laws which hold with (exceptionless) generality. We can count on there being a method of describing events which allows the formulation of exceptionless laws because, if the possibilities of adjustment and redescription run out, such cases *redefine* what is meant by an event or change. The relevance of a particular event, a change (or process, or state, or whatever) which is deemed to require causal explanation is not a matter which *nature* decides, but one which is decided within the confines of physics to better develop a comprehensive and closed system of laws which account for, but *do not govern*, the causal interactions of the world; and the relevance, or causal interest, attached to a singular causal sequence of events is confirmed by their having (or being found) a place as types of events within the causal-explanatory system.

Those who raise the mereological objection against this account of mental causation are correct in thinking that particular events (in common with types or kinds) may only be relevant relative to a theoretical system; but, however bizarre the physical particulars with which particular mental events are identical, they cannot thereby be judged irrelevant to physics on the basis of this; we cannot rule *a priori* that they are ineligible to fit into physical kinds. We cannot determine *a priori* which particular events should be treated as causally interesting, nor rule *a priori* that a particular event is ineligible to fit into any physical kind, and hence unable to be subsumed by causal laws. If the latter were true, many putatively indispensable particulars would have been judged ineligible to be sorted into kinds which fall under causal laws, since these, at some point or other in the evolution of the physical system, did not fit at all neatly into the taxonomy of physics, a system which then adjusted and expanded to incorporate them. Take quarks, for example: the first reported recordings of any particulars with the charge one third of that of an electron were made by Millikan in the oil drop experiment, in which he was

experimenting to determine the charge of an electron (many years before anybody postulated the existence of quarks).[94] At the time, electrons was postulated as being the bearers of the minimum unit of charge (e), so these individual readings were put down to experimental error, there being no physical description under which such entities could fall, nor any recognition that acknowledgement of the existence of entities smaller than an electron could be of causal interest, of any utility for prediction or explanation. Eventually the emphasis placed upon measurements of charge of exactly 1/3e went from being experimental error to experimental result and somewhere in that shift a novel kind was added to the theory. There are now experiments specifically designed to measure free quarks[95] and recreate quark-gluon plasma[96]; with the development and expansion of microphysical theory, quarks and particulars of many other related kinds of entities – muons, gluons, mesons, bosons, neutrinos, positrons and the like – have gained ontological respectability by featuring within a system of laws (albeit, perhaps, still a disputed system) where previously particulars of such kinds had none.

Further examples abound of paradigmatically physical kinds of entities gaining and losing their claim to relevance within the causal-explanatory system, in the course of that system evolving to become more comprehensive and capture more of the world in the sphere of what can be predicted or explained. There is something haphazard about this expansion, but although this may sound unusual or problematic to the philosopher it does not seem so to the experimenters who develop or expand the theory: sometimes they do not even have a conjecture, framable in terms of physical kinds, to test. Hacking passes on the anecdotal advice of the physicist, George Darwin:

> Every once in a while one should do a completely crazy experiment, like blowing the trumpet to the tulips every morning for a month. Probably nothing will happen, but if something did happen, that would be a stupendous discovery.[97]

Thus, any genuine instance of singular causation – that is, a case where concrete particulars are related as cause and effect – will fall under a causal law; for if such a sequence does not do so in the first instance, then our ontology of properties may be enriched in order to make this the case. Therefore, the Cause-Law Thesis can be upheld without appeal to regularities or nomic connections existing in nature, in the world independently of our classification, for our system of classification and generalisation could neither exist, nor succeed, without the cause-law thesis to (implicitly or explicitly) govern its progress. If properties and laws exist only relative to a theory, then any singularist account of causation in which it is logically possible that there are cases of singular causation not covered by a causal law, becomes implausible. It can be admitted

[94]J A Millikan (1908).
[95]LaRue, Fairbank & Hebard (Stanford), mentioned in Hacking (1983, 23).
[96]CERN (Geneva), see 'Fireballs of Free Quarks', *Scientific American* (April 2000).
[97]Hacking (1983, 154).

that singular causation is ontologically more primitive than nomic connections and general causal laws, in that the entities it relates exist independently of the particular theoretical taxonomy that we happen to have, without this admission creating difficulties for the close relationship between singular causation and causal laws. Singular causal connections and laws (or nomic connections) remain bound together, despite the distinction in ontological status between the two.

In contrast to the event theorist who adopts the realist construal of properties, it appears that the cautious property theorist can support the Cause-Law Thesis for event causation without invoking a conception of particulars which results in the Token Identity theory turning out to be highly implausible. Thus, she is able to provide an account of the explanatory ontology of properties and laws which avoids both the epiphenomenalist and mereological objections, thereby upholding the causal efficacy of the mind while maintaining a minimal account of the relationship of between the mental and the physical. Moreover, this account of properties as theory-dependent entities does not need the ontological and epistemological presuppositions required by the realist construal of properties, since it has been explicated with the worries of the Classificatory Sceptic in mind; and, in being adopted in conjunction with a theory-independent causal ontology of concrete particulars, the theory-dependent status of properties does not collapse into mind-dependence. The distinction between causation and causal explanation proposed by the event theorist may also be retrospectively justified, although it was not essential to the plausibility of the account of event causation in the first place; whereas this distinction would remain *ad hoc* if our theories do cut the world at its qualitative joints.

The initial plausibility of event causation and the realist construal of properties is, I suggest, outweighed by the complications it entails, both for its plausibility as an account of causation and explanation, and with respect to its accommodating the causal and explanatory efficacy of the mind. Event theorists would do better to follow the less-trodden path and face up to the challenge of providing an account of causation and explanation which places no emphasis upon the question of whether our theories cut nature at its qualitative joints.

CONCLUSION

6.1 A Suspicion Confirmed

In the course of this thesis, I have investigated the two principal ontological alternatives upon which an account of causation may be founded, and traced the relationships between the entities involved: firstly, where causes and effects are construed as nomically individuated property-instances (or entities partially constituted by properties or their instances); and, secondly, those which take causes and effects to be concrete particulars, most usually events.

In doing so, it has become clear that the conceptions of explanation, reduction and so on vary between property and event causation, and so too does the way in which these concepts may cohere into a plausible metaphysical system. The upshot of this is that supporters of these respective theories may mean very different things when they speak about 'causation', 'explanation', 'properties', 'the nomologicality of causation', 'causal laws', 'reduction' and so on, despite the similar terminology in use. The supporters of event causation who deny the existence of psychophysical laws, for example, are not making the same claim as a property theorist who asserts the anomalism of mental properties. In the former instance, the compatibility of two forms of explanation – folk psychology and physics – is at issue, while the property theorist is making a substantial claim about what kinds of properties the world contains. This is either a dualistic claim that the world includes mental properties *and* physical properties and that these are essentially distinct, nomically incommensurable objectively existing entities, or that nature is constituted purely by physical properties with mental properties having an essentially different ontological status and not contributing to the causal interactions of the world. Likewise, on the most plausible formulation of event causation, reduction is a theoretical device concerning the integration of apparently dissimilar theories or vocabularies; whereas for the property theorist, the reducibility of a family of properties to another again concerns the ontology of the physical or natural world.

Moreover, since the conceptual interdependencies within the respective causal theories are not isomorphic to each other, the way in which these theories may account for philosophical difficulties and accord with common-sense observations varies also. In a theory in which property-instances are causes and effects, for instance, it is simply not possible to drop the Cause-Law Thesis and deny that causation is nomological, since to do so would render the ontology of causes and effects into an ontology of bare particulars. On the other hand, the event theorist is not committed to the Cause-Law Thesis by the nature of causation, nor the causal relata she favours, although a singularist

causal theory would require some adjustment to the account I have given of physical *explanation* in the previous chapter.

The extent to which such conceptual interdependencies are peculiar to a specific metaphysical theory (or family of theories) and can affect whether particular philosophical problems arise, and how they may be accommodated, is obvious in the context of a discussion which concentrates explicitly on these theories, as the preceding discussion of causation has done. However, when the focus is shifted away from ontological matters, the causal theories I have been discussing usually remain as implicit background assumptions and disagreements between the ontological status of the entities involved, or the conception of the ways in which these relate to each other, may go largely unnoticed. It seems inevitable that these circumstances will be fertile ground for philosophical misunderstandings to arise. Even where both sides implicitly adhere to plausible and consistent metaphysical background assumptions, philosophical debates about the status of mental properties, or the existence of psychophysical laws, may really be disagreements about properties, or laws, in general. Thus, metaphysical disagreements are mislocated in the philosophy of mind where they are likely to prove insoluble; reflection on the nature of mind is unlikely to shed much light on the causal structure or ontology of the world. The suspicion expressed in the introduction, that many contemporary debates about the mind might be better dealt with in other areas of philosophy, appears to be confirmed.[1]

Also, since inference to best explanation is the soundest basis we have for the acceptance of one metaphysical system rather than another, it is not philosophically irresponsible to rule out accounts of causation which appear to create more problems than they solve for our intuitions about mental causation and the like. Perhaps the most notable account to be rejected in this thesis is the hybrid account of event causation combined with a realist construal of properties, which seemed fairly innocuous until its implications for the relationship of the mental with the physical were investigated. Such an ontology either creates difficulties for the causal efficacy of the mind, or it has no purchase on the nature of the relationship between the mental and the physical.

Moreover, since the property theorist and the event theorist can both tell reasonably coherent and consistent ontological stories which do not do too much damage to our intuitions about causation, explanation and mental causation, it is questionable which significant philosophical problems specific to *mental* causation remain. Accepting one of the alternative solutions commits one to certain other philosophical claims, of course: the property theorist is best served by maintaining the type identity of mental and physical

[1] See 0.1.

properties and the ontological reducibility of the mental to the physical which that implies, for example, while the event theorist must be careful about the conception of properties and explanation in play. But the acceptance of *either* properties, *or* events, as being the fundamental basis of the causal ontology permits the provision of an account of the mind which does not run into the myriad of philosophical obstacles debated in contemporary literature on the mind, such as the threat of epiphenomenalism and the suggestion that what we think does not cause what we do.

This is not to assert that the accounts of causation discussed in the previous chapters leave no philosophical problems to be addressed in the philosophy of mind, it would be overly optimistic to presume that all disagreements about the mind can be relocated and classified as differences of metaphysical opinion, and ultimately perhaps traced to clashes of intuition. In particular, the nature of mental properties, intentionality, rationality and consciousness all need to find their place in the rather scant causal explanatory pictures of the mental and the physical which have been sketched. But I think the discussions of this thesis should counsel caution about when we should acknowledge that a genuine philosophical problem needs to be addressed, rather than it being due to the employment of an implausible metaphysical system or some fundamental ontological disagreement.

6.2 A Final Preference for Event Causation

So far I have presented the competing accounts of causation I consider to be most plausible based either on an ontology of events, or of properties, and rejected those metaphysical variations which seem unstable or unmotivated. From the remaining ontological variants, my personal preference is for event causation, an opinion which is most probably implicitly obvious already. Two principle reasons lie behind this choice, although I doubt that they will convince the supporters of property theory to entirely abandon their view: the theory of causation based on events requires the acceptance of fewer fundamental presuppositions as primitive; and it least constrains what counts as a plausible theory of mind.

The latter point arises from a general concern (which I held before embarking on this predominantly metaphysical investigation) that the Type Identity thesis is too strong a relationship between the mental and the physical;[2] and yet, if causation is an objective relation between natural properties then Type Identity is the only way in which the mental can remain causally involved. Causation between natural properties appears to dictate what the relationship between the mental and the physical must be, which might count as an advantage of the thesis were its formulation of this relationship plausible; but

[2]Familiar objections to Type Identity were raised in Chapter 3 (see 3.14).

those who would rather reject Type Identity had better also avoid properties, and entities partially constituted by them, as the fundamental ontology of causation.

Secondly, the account of causation in terms of events and a non-realist account of properties requires fewer primitive presuppositions about the objective world than does the theory of sparse natural properties, in order to provide a coherent metaphysical background theory of our everyday observation and experience of causation. The coherence of the ontology of properties requires our assuming that nature has objective qualitative joints, and may well also involve an additional assumption about our favoured epistemic access to such entities, in order to remove the threat of Classificatory Scepticism.

Although many philosophers obviously have no qualms about these assumptions, I worry that they fix too much of the nature of the world as a matter of fundamental fact, too much is being decided *a priori*. The alternative, event causation, is much more minimal with regard to what it claims about the causal nature of the world, so it could continue to serve as the causal ontology through radical paradigm shifts in our empirical investigation of what the world contains. Event causation is compatible with a wider range of ways which the world may turn out to be once we leave our armchairs, so there is little danger that the event theorist is poaching on empirical preserves. As a metaphysical background theory it is remarkably unobtrusive, which I take to be an advantage of metaphysical theories in post-Humean or verificationist philosophy; adhering to a minimalist metaphysics is, I suggest, the best way to be wary of metaphysical speculation while acknowledging that metaphysics cannot be dispensed with altogether. The force behind this sentiment is aptly captured by Goodman:

> You may decry some of these scruples and protest that there are more things on heaven and earth than are dreamt of in my philosophy. I am concerned, rather, that there should not be more things dreamt of in my philosophy than there are in heaven or earth.[3]

That this minimalism should be a guiding methodological principle in metaphysics, however, I shall leave as a primitive assumption.

[3]1954, 34.

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