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LINDSAY CULLEN

Nancey Murphy, Supervenience and Causality

Nancey Murphy argues in Beyond Liberalism & Fundamentalism*, that a post–modern approach to metaphysics, based on a non–reductive physicalism, will allow a fruitful bridging of the gap between interventionist and immanentist views of God's interaction with the world. This is achieved through her contention that there are causally significant 'higher level' laws which can affect interactions and which are neither constrained by, nor reducible to, lower level laws (such as the laws of physics). Whilst her aim is to be applauded, her methodology is somewhat flawed. In particular, her scientific defence of a non–reductive view is shallow and unpersuasive, and her use of the philosophical concept of supervenience is both eccentric and unhelpful. Thus her argument regarding higher–level laws founders, taking with it her basis for a rapprochement between 'liberals' and 'conservatives' on this particular topic.*

Keywords: causality, physicalism, reductionism, supervenience.

Introduction

In her insightful and thought–provoking book, *Beyond Liberalism & Fundamentalism*[1], Nancey Murphy argues convincingly that the philosophical framework of modernism has been responsible for forcing theologians into a series of related 'either–or' decisions regarding epistemology, the meaning of religious language, the relationship between science and religion, and the nature of divine action in the world. Furthermore, she maintains that the answers given to these questions characterise the unbridgeable divide between liberal and conservative theologies. Thus, liberal theologians have generally based their epistemology on an experiential foundationalism, their understanding of religious language has been expressivist, they have seen science and religion as incommensurable[2], and they have seen divine action in terms of an immanentist model. Murphy contends that each of these decisions is inextricably linked with each other, meaning that these particular answers form one

1 Murphy, N. *Beyond Liberalism & Fundamentalism*, Valley Forge, Pennsylvania: Trinity Press International (1996)

2 If this seems surprising, given the normal characterisation of liberal theology as generally deferring to science, we need to understand that by 'incommensurable', Murphy means that the two subjects are addressing fundamentally different realms and thus in fact, differing descriptions of a feature or event are not incompatible. This is similar to Stephen J. Gould's idea of 'non-overlapping magisterium' (NOM's).

coherent possible set of answers. On the other hand, conservative theologians have generally held to a foundationalist epistemology based on the scriptures; they have seen religious language as propositional, and hence as commensurable, though often at odds, with scientific descriptions, and finally, divine action has been perceived as interventionist. Again, these particular answers form a coherent whole and thus tend to be held together.

Having argued for this analysis of the fundamental alienation of liberal and conservative theologies, Murphy then comes to the real thrust of her work. Her contention is that the non–foundational, post–modern framework becoming ever more entrenched in philosophical circles provides an appropriate and useful way out of the modernist inspired division outlined above. Thus, foundationalist epistemology, whether based on scripture **or** experience is called into question. Instead, epistemological holism provides a framework within which a broad range of different understandings can be accommodated. Similarly, a post–modern understanding of language allows us to recognise both the affective and the propositional elements of language use. Thirdly, post–modern metaphysical holism allows for an understanding of divine action which is neither as restrictive as the liberal immanentist position, nor as dismissive of the standard scientific worldview as conservative interventionism.

It is this third contention of Murphy's regarding postmodernism and divine action which is problematic, and will be questioned by this paper. Furthermore, somewhat ironically, Murphy herself introduces one of the main tools we will need to cast doubt on her third thesis, in the form of the concept of supervenience.[3]

Murphy's Argument

To begin with, we need to examine Murphy's understanding of the current scientific paradigm, for it is upon this that she bases her theological conclusion regarding divine action. In surveying current scientific scholarship, Murphy is at pains to highlight any move away from reductionism and attendant "'bottom up' causality".[4] The case she is aiming to build begins with the idea that 'whole systems and their parts mutually condition one another'.[5] So causation is not limited to the 'bottom' level but extends to all the levels of a system and furthermore, acts between levels. The next step of the argument is that these causal interactions at higher levels are genuinely law–like, and cannot be reduced to lower level laws. Finally her conclusion is reached: 'it was simply a mistake to suppose that the laws of physics determine all natural events. This leaves us free to speculate that the totality of natural laws, comprising all lev-

3 Albeit with a definition which as I hope to demonstrate, is an eccentric one which robs the term of any real meaning.
4 Murphy, *op.cit.*, p. 65.
5 Ibid., p. 144.

els in the natural – scientific and social – scientific hierarchy, are together incomplete.'[6] Thus there is left plenty of room for an account of God's action within the world. Indeed to quote Murphy again, 'Just as new kinds of entities with their own proper forms of action need to be recognized as we go up the scale of complexity because we cannot explain the phenomena without recognizing them, so too divine acts may need to be recognized for a complete account of the direction of natural and human history.'[7]

This is indeed a neat solution to the perennial problem of divine action. On the one hand it aims to mollify the scientific community by allowing that, for instance, the laws of physics are indeed maintained as laws, without any of the breaking of those laws required by standard interventionist schemes. On the other hand, by contending that those same laws of physics do not encompass all possible sources of causality, Murphy allows for God to be as interventionist as He pleases[8], through the medium of yet undiscovered 'higher level' causal laws. Neat indeed. The only question left is whether Murphy's argument holds water.

Let us then examine the steps in her argument in some more depth. Murphy's primary claim is that the modernist idea of reductionism is being replaced in the post–modern age by a non–reductive physicalism, which is ontologically materialist but opposes a reduction of all processes to the level of physics. To back up this claim she advances scientific and philosophical considerations. Let us explore each of these and their implications in turn.

Scientific Issues

On the scientific side, Murphy proposes that scientists have come to a realisation that, as she says, 'in simple terms, one has to consider not only the parts of an entity but also its interaction with its environment in order to understand it. Since the entity plus its environment is a more complex system than the entity itself (and therefore higher in the hierarchical ordering of systems), this means that a 'top–down' analysis must be considered in addition to a 'bottom–up' analysis.' On the face of it, this is an unexceptional statement. Indeed one wonders whether Murphy has in mind something of a straw man in the reductionism she targets. For even the most ardent reductionist will agree that both the arrangements of an object's parts as well as its interactions with the environment will affect that object. Further, it is surely a triviality to say that an object considered with its environment will be more complex than the object considered alone. Perhaps Murphy confuses the methodological strategy of isolating an object in order to better understand its workings, with some kind

6 Ibid., p. 147.
7 Ibid., p. 147.
8 Of course it may also reasonably be doubted that such 'higher level' laws, even if they existed, could achieve much given the constraints of abiding by 'lower level' laws.

of ontological commitment to ignoring the organisational or environmental situation of a given object — a commitment which surely no sensible scientist or philosopher would hold.

The contentious part of Murphy's statement above is the implication that in and of itself, the added complexity of environmental considerations requires an analysis of the entity which is somehow different not only in degree but in kind, to that which might otherwise be necessary. To give a simple example, in analysing, say, an automobile engine, it is obvious that an analysis which proceeds only in terms of the components of the engine and ignores their relative placement and organisation will be missing some substantial and important properties of the engine. Furthermore, it is clear that a full account of the engine will also require an understanding of its environment: 'Is it attached to other car components?'; 'Is it in a workshop? On a road?' And so on. It is not clear however, at least to this author, that this analysis is necessarily different in kind (as opposed to scope) than that which might be used in a simple analysis of the engine's components.

This observation leads directly on to the topic of 'emergence', one of three factors which Murphy identifies as having contributed to the demise of reductionism in science. The term 'emergence' or 'emergent order' refers to properties and processes which appear only at more complex levels of organisation and which thereby need new levels of description. Murphy further claims that 'The new concepts needed to describe the emergent properties are neither applicable at the lower level nor reducible to (translatable into) concepts at the lower level.'[9] She goes on to say that the irreducibility of concepts entails the irreducibility of laws and hence the need for 'emergent laws'.

Unfortunately Murphy gives no examples of emergence but in an effort to understand both the application and the limitations of the concept, let us return to our automobile engine. It is clear that in considering the components of a working engine, there are a number of salient properties which are not enjoyed by the same components sitting in a disorganised pile in the workshop corner. So it is true to say that the behaviour of a working engine 'emerges' when a higher level of organisation of a particular type is imposed upon its component parts. So far this is uncontroversial. The difficulty arises where an emergent property or process is attributed independent causal powers, a move which shortly will be seen to be integral to Murphy's argument. Returning to our engine example, while it may be true to say that valve A rises and falls because of the engine's emergent property of internal combustion, it is also true that valve A rises because valve stem B pushes and pulls it, having been in turn moved by rocker C and so forth.[10] The two stories must surely be descriptions of the exact same physical event, albeit at different levels of abstraction, and as such there is no causal efficacy in the emergent behaviour apart from what is

9 Murphy, *op.cit.*, p. 139.
10 I stop now for fear of falling into gross technical inaccuracy!

shared with (or some might say, derived from) the causal power of the component parts. The alternative suffers from the same problem of over–determination which Murphy (with any number of other philosophers) identifies as posing insurmountable problems for dualism.[11]

Having mentioned the phenomenon of emergence, Murphy then turns to 'decoupling' — the second of the three features supposed to have led to the demise of reductionism. Unfortunately this is a very weak section in an otherwise excellent book. Perhaps Murphy is simply at the limits of her scientific understanding but the following paragraphs seem to be little more than an attempt to impress the uninformed through the use of scientific jargon. Murphy states that ''Decoupling' is a technical term in physics but can be used more loosely to describe the relative autonomy of levels in the hierarchy of the sciences.' Indeed 'decoupling' is used as a technical term in physics, in a wide variety of different contexts, ranging from a process thought to have occurred after the Big Bang, through to uses in magnetic resonance spectroscopy, electrical engineering and even computer programming. Murphy does not indicate which phenomenon she has in mind in her use of the term, nor does she justify in any way her contention that the word can refer to the 'relative autonomy of levels of hierarchy'. She then simply quotes science writer, Silvan Schweber who refers to decoupling along with two other phenomena from the realms of particle physics as suggestive of a world layered into 'quasiautonomous domains' whose 'ontology and dynamics [are] essentially quasistable … and virtually immune to whatever happens in other layers.'[12] This final clause of Schweber's regarding the immunity of layers is especially interesting given the use to which Murphy wishes to put these concepts, that is, an attempt to show that inter–level causation is a significant factor in the current scientific worldview.

Murphy then turns her attention to the concept of 'top–down' or 'whole–part' causation which she believes is introduced as a possibility by the supposed loosening of causal relationships evidenced by the phenomena of emergence and decoupling. The idea of downward causation is that the (emergent) properties and laws of a higher level system exert a causal influence on the components of the system. Murphy states, 'It is now coming to be recognized in a wide variety of sciences that interactions at the lower levels cannot be predicted by looking at the structure of those levels alone. Higher–level variables, which cannot be reduced to lower–level properties or processes, have genuine causal impact.'

In these two sentences we find Murphy gliding over the surface of one of the most interesting and controversial questions in the philosophy of science, that is, the relationship between explanation and prediction. For as Paul Moser and

11 Murphy, *op.cit.*, p. 66.
12 Schweber, S.S., 'Physics, Community and the Crisis in Physical Theory', *Physics Today* (1993) (November) 36. cited in Murphy, *op.cit.*, p. 139.

J.D. Trout state in their editorial introduction to a collection of essays on contemporary materialism, it is an important matter of some controversy that 'causal notions are crucial to explanation but not to prediction.'[13]

Let us take a moment to outline the issues involved. Over the last century, it has become clear that the 'billiard–ball' picture of the universe made popular by Newtonian mechanics was severely limited. In particular, there are several areas where our ability to predict outcomes is curtailed. One such area is that of complex systems, sometimes called 'chaotic dynamics'. These systems are extremely sensitive to starting conditions and their complexity means that they very rapidly diverge from any prediction given even the slightest inaccuracy. While this is clearly a difficulty of praxis, rather than one of principle, it has also been suggested that some dynamic systems are in fact theoretically impossible to predict because the complexity of outcomes is such that an accurate prediction cannot be computed within the constraints of our universe. This is a highly controversial point of view, but nonetheless it is apparent that at least to all practical purposes, some systems do and possibly always will, defy predictive analysis. As Murphy points out, in some cases, such chaotic behaviour is confined to one level of the system and higher level predictions are made possible because of higher level laws, perhaps statistically based. A perfect example of this is the Ideal Gas Law,[14] whereby the average kinetic energy of a large number of individual molecules, as measured by their temperature, is proportionately related to the pressure they will exert on their container in a perfectly law–like and predictable relationship. In other cases, for example liquid turbulence, prediction is still problematic.

It is clear that this kind of case provides an example of emergent behaviour which can be predicted by higher level laws but not (at least practically) by lower level laws. However this is not the same as saying that the behaviour at the lower level is *caused* or *constrained* by the higher level law. To use the gas laws as an example, we would *not* say that the kinetic energy of any given individual molecule was determined by the pressure or volume of the overall system. It seems that causality only runs in one direction. Furthermore when we come to *explain* the gas law, we turn to the micro level and speak in terms of the number of collisions of molecules with the container walls and so forth. Here then, we see the asymmetry between prediction and explanation. While accurate prediction may require the higher level description of the gas law, explanation, which is concerned with causality, works on the lower level.

Another area in which the predictive capacities of reductive analysis are similarly limited is that of quantum mechanics. Here, problems of prediction are concerned with the probabilistic nature of particular quantum events. For instance, it is impossible to predict whether a particular atom of a radioactive

13 Moser, P.K. and Trout, J.D. (ed.s) *Contemporary Materialism: A Reader* London: Routledge (1995) p. 10.

14 pV=nRT, where p is pressure, V is volume, n is the amount of gas (in moles), R is the gas constant (approximately 0.0821) and T is the temperature.

substance will decay in a given period. All we can do is to assign a probability to the event, or speak statistically about the average behaviour of large numbers of such atoms. It is clear that here as with the area of chaotic dynamics, the issue is epistemic rather than causal, so that in giving a causal explanation of why certain changes took place in an irradiated piece of fruit, we would immediately turn to the lower level in order to speak of alpha or gamma particles emitted by individual atoms within the radiation source and their effect on the fruit.

In short, many objections to reductionism on the basis of the idea of downward causation fail inasmuch as they tend to confuse the ontological project of reduction with the possibility (or otherwise) of epistemic reduction. Most standard definitions of reductionism entail the *explication* of the reduced system in terms of another system, and it seems clear that it is quite possible for a phenomenon to be both completely explicable in terms of the components of the system, and yet to be immune to prediction. There does not seem to be any causal gap into which we may fit the 'mutual conditioning' of a system and its parts to which Murphy refers.[15]

With this background in mind let us return to Murphy's comment on downward causation quoted above. 'It is now coming to be recognized in a wide variety of sciences that interactions at the lower levels cannot be predicted by looking at the structure of those levels alone. Higher–level variables, which cannot be reduced to lower–level properties or processes, have genuine causal impact.' As can now be clearly seen, Murphy simply evades the whole thorny issue of explanation versus prediction by blithely concatenating a fairly non–controversial statement regarding prediction with a highly controversial one regarding causation as if the one followed logically from the other. She repeats this dubious strategy in her conclusion to the chapter. She begins with a statement most people would happily accept, to the effect that there has been a 'recognition that the organization of the whole makes it (in some sense) more than the sum of its parts'. However without further argumentation, she goes on in the same sentence to proclaim that the said entity possesses its 'own specific sorts of agency'[16], a claim which is rather controversial, not least because there has been no adequate previous definition of this 'specific sort of agency'.

That Murphy at her best recognises the difference between explanatory or causal constructions and predictive or descriptive accounts becomes clear when she admits that 'Reductive explanations have greatly strengthened all of the sciences by explaining phenomena that could only be described at the higher levels.'[17] It is a pity that she did not take this distinction into greater account in her discussion regarding emergence, decoupling and downward causation.

In summary, the scientific evidence Murphy adduces in her anti–reduction-

15 Murphy, *op.cit.*, p. 144.
16 Ibid., p. 152.
17 Ibid., p. 145.

ist argument is both somewhat scanty and ambiguous in what it affirms. Certainly there is real doubt as to whether she has successfully demonstrated that the consensus of scientific understanding allows for the kind of inter–level, or top–down causation which forms the lynchpin of her argument regarding the possibility of divine causation following this model.

Philosophical Concepts

Murphy now turns to the philosophical ideas which she believes help to build the case for a non–reductive approach and in particular to the concept of supervenience. While a number of philosophers have found the concept of supervenience of some help in exploring the vexed issues already touched on concerning higher level properties and processes, Murphy's definition of the term is at odds with the general established usage and robs the term of its real strength.

Supervenience as a concept is generally thought to have begun in the discipline of moral philosophy. R.M. Hare is credited with popularising the term in philosophical circles by a discussion in which he says,

> First, let us take that characteristic of 'good' which has been called its supervenience. Suppose that we say, 'St. Francis was a good man.' It is logically impossible to say this and to maintain at the same time that there might have been another man placed exactly in the same circumstances as St. Francis, and who behaved in exactly the same way, but who differed from St. Francis in this respect only, that he was not a good man.[18]

Donald Davidson in speaking of the supervenience of the mental upon the physical, defines the concept such that 'there cannot be two events alike in all physical respects but differing in some mental respect, or that an object cannot alter in some mental respect without altering in some physical respect.'[19] It may be noted that Davidson's two statements are not necessarily of identical import[20] and indeed various related definitions of supervenience have been proposed which are distinguished among other things by how they adhere to one or both of the criterion Davidson evinces. As one further example of a definition, let us turn to Jaegwon Kim, who, specifying what he calls 'weak supervenience'[21], defines it as follows:

> A weakly supervenes on B if and only if necessarily for any x and y if x and y share all properties in B then x and y share all properties in A — that is,

18 Hare, R.M. *The Language of Morals*, London (1952) p. 145. cited in Kim, J. *Supervenience and Mind*, Cambridge: Cambridge University Press (1993) p. 55.; also Murphy, *op.cit.*, p. 142.
19 Davidson, D., 'Mental Events', in Moser, P.K. and Trout, J.D. (ed.s) *Contemporary Materialism*, London: Routledge (1995) p. 112.
20 The fine distinction hinges on the question of whether 'cannot' holds modal force in each of the two constructions, and hence whether the supervenience relationship holds constant over all possible worlds, or simply within any given world.
21 Roughly akin to Davidson's first explanation.

indiscernibility with respect to B entails indiscernibility with respect to A.[22]

Now let us turn to Murphy's treatment of supervenience. Murphy begins with the same quotation by Hare, however she proceeds to focus on one particular element of Hare's description in a unique manner, that is, his phrase 'placed in the same circumstances'. Murphy contends that this element of the role of circumstances is critical to an understanding of supervenience and goes on to define supervenience as the relationship such that: 'for any two properties A and B, where B is a higher-level property than A, B supervenes on A if and only if something's being A in circumstance c constitutes its being B.'

Now this particular stress on the circumstances is extremely curious, for it emphasises the trivial at the expense of the complex. Consider again Hare's definition: he is comparing two hypothetical men, St Francis and another who acted identically in the same circumstances. The dual points of comparison are their behaviours, and their moral status and the point at issue is whether the one can differ where the other is identical. The clause concerning identical circumstances is simply a constraining condition so that like may be compared with like. If the circumstances were *not* alike then, ethically speaking, it almost goes without saying that their moral status might be profoundly different regardless of similar behaviour. To understand the point Hare is making, let us consider another moral philosopher who makes the same point without using the word supervenience. G.E. Moore describes a relationship between moral and non–moral properties:

> … if a given thing possesses any kind of intrinsic value in a certain degree, then … anything exactly like it, must, under all circumstances, possess it in exactly the same degree.[23]

Interestingly, perhaps because he is referring to an object rather than an action, Moore specifically states that the relationship ought to hold in *all* circumstances, rather than in one fixed set of circumstances. Nevertheless, both Hare and Moore are in effect excluding circumstance as a variable for the purposes of this comparison of moral and non–moral properties; Hare by freezing the circumstances in place and Moore by insisting on the relationship holding over all circumstances. So it seems that Murphy's definition of supervenience is out of step not only with the mainstream of commentators but even with Hare himself — the source she cites as her point of reference.

Now let us see how Murphy develops her argument in the light of this eccentric definition. She goes on to assert that this concept of supervenience applies to the differing descriptions of reality given by science and other disciplines pertaining to different levels of scale or complexity. She contends that such differing descriptions are not related by identity or causal relation but by supervenience. Further, the defining characteristic of such supervenient relationships is that the supervening description will take account of broader circum-

22 Kim, *op.cit.*, p. 58.
23 Moore, G.E. *Philosophical Studies*, London (1922) cited in Kim, *op.cit.*, p. 54.

stances or context not addressed by the lower level description. She adds that laws of nature are always subject to a *ceteris paribus*[24] clause: "so long as nothing else interferes with the system'' and thus lower–level laws cannot describe supervenient systems since such supervenience involves additional contextual variables which will interfere with the closed system assumption of the lower–level laws.[25] This supposed failure of lower–level laws to solely determine matters leads in Murphy's estimation to a failure in causal reductionism and hence to the possibility of 'whole–part' or 'top–down' causation.

Having chosen to use an unusual definition of supervenience, the primary weakness in Murphy's argument stems from her contention, without substantiation, that descriptions at different levels of reality are related by supervenience, so defined. While Murphy rejects without comment the idea that such descriptions are related by identity, this surely is the common-sense point of view. As philosopher Mary Midgely has remarked[26], we may make any number of different maps of an area — political, geographic, atmospheric and so on — according to our purpose but each of these maps is a representation of identical territory. To cite another example where the concept of supervenience is often applied, let us consider two descriptions of a mental event. As I am writing, I suddenly recall that my printer has run out of ink. This leads to a feeling of concern and to a decision to go out shortly to buy a new cartridge. Now this description can be paralleled by one which involves the activation of one group after another of neurones within my brain. It has seemed only reasonable to the majority of scientists and philosophers to see both of these descriptions as pertaining to an identical event.[27] Murphy claims that only non–reductive physicalism is proof against an elimination of the efficacy of mental causality. However properly understood, a token identity relationship whether in a reductive or non–reductive setting will maintain the causal efficacy of the mental. For when I say that my recalling of the printer ink caused me to decide to go out and shop, this is identical to saying that one configuration of neurones led to a different configuration. Either way, the single event in question was truly causal — I simply choose the description of that event which is most helpful in the circumstances.

Furthermore Murphy's assumption that lower–level laws cannot take into account contextual variables does not seem justified. Consider again the mental event just described. It is no doubt true that any number of environmental considerations impact my train of thought. However it seems equally clear that my low–level description takes each of these variables into consideration because they simply represent further facts concerning the neural activity pres-

24 Other things being equal.
25 Murphy, *op.cit.*, p. 143.
26 In conversation.
27 The vast majority of commentators would affirm such token identity without necessarily endorsing type identity. Rosenthal, D.M., 'identity theories', in Guttenplan, S. (ed.) *A Companion to the Philosophy of Mind*, Oxford: Blackwell Publishers (1994) p. 355.

ent at the time of the mental event under consideration. For example my anxiety about getting this paper printed in good time will be somehow represented within the neural structures in my brain and this will inevitably impact the course of neural activity following my recollection of the printer situation.

Even if for the sake of argument we were to agree with Murphy that lower–level laws cannot fully describe a supervening level, this does not justify her following step, which is to postulate a failure of causal reduction. This is again to confuse a *description* of the higher level with a causal explanation of the system in question.

Behind all of Murphy's discussion lies the assumption that non–reductive physicalism will provide her with the possibility of inter–level causality and hence an analogy of how divine action might work on a 'top–down' basis. However it seems likely that this hope is a chimera. It is doubtful that non–reductive physicalism will perform the duty she requires. Indeed the very cohesiveness and viability of non–reductive physicalism itself as a position has been questioned. Outlining the argument in brief:[28] the very point of non–reductive physicalism is to avoid eliminating the mental. Such a position wishes to see mental properties as real. But this necessarily implies that such mental properties are causal properties. After all, if a property does no causal work, it is difficult to see what possible explanatory value it serves. So let us assume that some event occurs as a result of mental causation, for example a feeling of thirst makes me get some water. However, one of the tenets of non–reductive physicalism is that every event is a physical event and furthermore it may be assumed that any event which has a cause has a physical cause. Thus we are left with two causal explanations for our event — a mental cause and a physical one. The question is, 'How are these two causes related?' As can be seen, the problem of overdetermination again rears its ugly head, unless we conceive the relationship of the two causes to be one of identity.[29] The difficulty is that such an assertion of identity of physical and mental properties is just such a condition as would allow for the creation of 'bridge laws' and the subsequent reduction of the mental to the physical. Thus it seems that non–reductive physicalism is pushed towards either eliminativism or outright reductionism. The comfortable middle ground does not appear to be an option.

The final point which may be made is that nothing Murphy has said here regarding supervenience or related philosophical concepts has dealt with the problem of the causal gap. It seems clear that the idea of downward causation suffers irremediably from over–determination, for as we have seen previously there always seems to be a causal story at the lower level of description which can account for the systemic behaviour in question. Murphy has previously pointed out that identical problems have driven most philosophers to reject

28 I am indebted here to Kim, *op.cit.*, p. 267–284.

29 Kim also suggests a relationship which he describes as 'supervenient causal relations' reliant on micro–causal processes, but I fail to see how this scheme is anything other than a fancy way of asserting an identity relationship.

mind–body dualism.[30] She should not then be surprised if most philosophers also reject the idea of downward causation. In fact Murphy herself acknowledges the continuing problem of the 'causal joint' as it particularly applies to an account of divine action[31] — but she fails to recognise that her whole account of top–down causation suffers from the same defect.

Conclusion

In conclusion, we have seen that Murphy's supposed scientific evidence for the demise of reductionism is at best controversial. While there has certainly needed to be and has been a reshaping of the fundamental reductionist position in order to take account of emergent phenomena, a robust defence of a more sophisticated reductionism is still in evidence. Further, as our discussions of supervenience have shown, even if a non–reductive position is taken, it seems that this is unlikely to facilitate, let alone to necessitate the kind of downward or inter–level causation required by Murphy's argument. What seems to be required in order to allow for divine action of the type envisaged by Murphy, is a world in which higher level properties and processes *do not* supervene on lower–level entities. However this would require a fundamental re–ordering of our understanding of reality.

Despite a bold attempt, it seems that the third of Murphy's three bifurcations is not as responsive to the post–modern prescription as she had hoped. Until and unless an account of divine action is formulated which overcomes the fundamental problem of the causal gap, theologians will continue to be faced with a stark choice between two alternatives. The first is a thorough–going rejection of the causal closure of the universe, thus allowing God an unfettered field of action in which to intervene. That this raises immense problems for our fundamental scientific worldview is without question. The alternative, an entirely immanent description of divine action also provides some difficulties: 'In a world where all events are caused by God, can some events, that is, those we label 'miracles', be somehow *more* divinely inspired than others?' 'What, on this view, is the significance of the incarnational event?'

One way or another there is still a rich vein to be mined here in coming to a greater understanding of divine action in a physical world. In her conclusion, Murphy declares that this is an exciting time to be doing theology. I do not disagree with her.

Revd. Lindsay Cullen is a doctoral candidate (Philosophical Theology) with the University of Wales, through Spurgeon's College, London.

Editor's note: A response from Nancey Murphy will be published in the next issue of the journal

30 Murphy, *op.cit.*, p. 66–67.
31 Ibid., p. 149.