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SAMUEL ALEXANDER'S EMERGENTISM: OR, HIGHER CAUSATION FOR PHYSICALISTS

ABSTRACT. Samuel Alexander was one of the foremost philosophical figures of his day and has been argued by John Passmore to be one of 'fathers' of Australian philosophy as well as a novel kind of physicalist. Yet Alexander is now relatively neglected, his role in the genesis of Australian philosophy if far from widely accepted and the standard interpretation takes him to be an anti-physicalist. In this paper, I carefully examine these issues and show that Alexander has been badly, although understandably, misjudged by most of his contemporary critics and interpreters. Most importantly, I show that Alexander offers an ingenious, and highly original, version of physicalism at the heart of which is a strikingly different view of the nature of the microphysical properties and associated view of emergent properties. My final conclusion will be that Passmore is correct in his claims both that Alexander is significant as one of the grandfather's of Australian philosophy and that he provides a novel physicalist position. I will also suggest that Alexander's emergentism is important for addressing the so-called 'problem of mental causation' presently dogging contemporary non-reductive physicalists.

Samuel Alexander was born in Sydney, in 1859, and grew-up in Melbourne, though he spent his professional life as a philosopher in England at the Universities of Oxford and Manchester.[1] Nonetheless, John Passmore has argued that Alexander played a key role in the genesis of Australian philosophy through his intellectual influence on John Anderson, arguably one of its 'fathers'.[2] Given these credentials, one would expect that Alexander would be closely studied, yet, despite Passmore's enthusiasm, Alexander is barely discussed by philosophers in Australia, apparently treated more as an embarrassing 'crazy uncle' than an important intellectual forebear. And this type of divergence of opinion over the significance of Alexander's work extends much more widely, both to his own time and to the contemporary debate over emergentism.

In his own day, Alexander's work was taken by many to be profound. For example, Whitehead said of his contemporaries, who obviously included Russell and Moore, that Alexander had the greatest and most important influence upon his thinking.[3] And C.D.

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Broad reported that Alexander's main work, *Space, Time and Deity*, was "eagerly awaited" by philosophers, who hoped it would be:

> ... a comprehensive system of constructive metaphysics in which the speculative boldness of the great Germans should be combined with the critical good sense of Locke, Hume and Berkeley. On the whole, Prof. Alexander's readers will not be disappointed ... (Broad 1921, p.23).

This is obviously high praise, yet other philosophers of the time argued that Alexander's emergentism involved "grave contradictions" with G.F. Stout ultimately concluding it literally "involves ... absurdity".[4]

Such puzzling divergences about Alexander's emergentism have persisted into the contemporary debate where Jaegwon Kim and Brian McLaughlin have been largely responsible for crafting a subtle and charitable interpretation of the so-called "British Emergentists" who comprised J.S. Mill, G.H. Lewes, Alexander Bain, C. Lloyd Morgan, C.D. Broad and Alexander himself.[5] But, amongst all these philosophers, we only find McLaughlin worrying explicitly about his interpretation of Alexander and frankly stating that he finds conflicting passages in his work.[6] As a result, it is perhaps unsurprising that Kim and McLaughlin both charitably reinterpret Alexander as an anti-physicalist committed to fundamental non-physical forces despite his explicit statements to the contrary. In contrast, Passmore argues that Alexander is a novel variety of physicalist, one who accords a central role to the sciences in filling-out the details of his metaphysical framework.[7]

These striking differences raise a number of questions. What prompts these dichotomies about Alexander's work, between judgements of profundity and absurdity, or physicalism and anti-physicalism? Is Alexander's view a physicalist position? And what is the final significance of Alexander's emergentist ideas? Although these issues also have relevance to his wider metaphysical system, my goal in this paper is to answer these questions about Alexander's emergentism.

Initially making heavy use of Alexander's texts, I shall argue at length, in Parts 1 and 2, that Alexander has been badly, although understandably, misjudged by most of his critics and interpreters, both past and present. I will show that Alexander offers an ingenious, and highly original, version of physicalism under which higher level properties are realized by combinations of lower level properties and relations, but where these higher properties are nonetheless causally

efficacious. At the heart of his position, I will show that Alexander defends a strikingly different view of the nature of the microphysical entities, for he takes the contributions of causal powers by microphysical realizer properties to be partially, non-causally determined by the "emergent" higher level properties they realize. This view of the microphysical, and the account of property emergence based upon it, allow Alexander to solve many of the philosophical conundrums of his day. For example, since there was considerable evidence against the truth of the so-called 'Completeness of Physics' in Alexander's time it was a strength of his account that it arguably shows how physicalism could be true whilst the Completeness of Physics is false.

My arguments, however, will not merely be exegetical, for the main reason his recent interpreters have not taken Alexander at his word is that they think his explicit position is incoherent. This is a reasonable interpretive concern and, in Part 1, I will illuminate the metaphysical arguments that underlie it. In response, in Part 3, I outline a precise metaphysical framework that I shall argue shows Alexander's emergentism is in fact logically coherent when applied to realizer/realized properties. Consequently, we will see that Alexander's emergentism succeeds in illuminating a thoroughly physicalist universe in which realized higher level properties are causally efficacious, but where the Completeness of Physics does not hold true.

I will conclude the paper, in Part 4, by briefly noting the implications of my work for Alexander's significance to the history of Australian philosophy and, perhaps more importantly, by exploring the potential relevance of Alexander's ideas for the difficulties faced by contemporary physicalists. With regard to the latter issue, I will suggest that Alexander's emergentism is still significant, since the position provides one of the few coherent ways by which physicalists can continue to accept the causal efficacy of realized properties, both mental and otherwise, in a physicalist world. My final conclusion will be that Passmore is correct in his claim that Alexander is important as one of the grandfather's of Australian philosophy and one who still has wisdom to impart.

1. ALEXANDER'S COMMITMENTS AND THEIR PROBLEMS

Alexander's central work *Space, Time and Deity* is divided into two volumes. The first volume deals with the fundamental metaphysical

categories, whilst the second considers the character and relations of the natural entities illuminated by the sciences. My focus will solely be upon the latter volume and Alexander's account of what he terms "empirical" qualities or properties, which include the material, chemical, biological, mental and secondary qualities.[8] (However, I will not discuss Alexander's views about the secondary qualities since these introduce difficult side issues).

As a metaphysical framework, I will use Sydney Shoemaker's 'causal theory of properties' (Shoemaker 1980) under which a property is individuated by the causal powers it *potentially* contributes to the individuals in which it is instantiated. Every property is distinguished by an array of such causal powers and two properties are only distinct if they differ in the causal powers they potentially contribute to individuals. We shall see that the causal theory is a natural one for discussing Alexander's views on empirical qualities, since he takes the latter to be individuated by their causal powers. For reasons that will become apparent below, I shall also focus on properties I term 'causally efficacious', that is properties whose instantiation *actually determines* an individual's causal powers.[9]

As with all the British Emergentists, Alexander holds an evolutionary view of the universe in which, over time, the material entities, or what I will term the 'microphysical' individuals and properties, aggregate into more and more complex structures.[10] As such entities aggregate, Alexander argues that the universe takes on a layered structure, where we have what he terms "levels" of entities – the "higher level" entities being built out of the "lower level" entities. Like the other British Emergentists, Alexander holds that new "emergent" properties come into being as microphysical individuals and their microphysical properties are aggregated in this manner. However, as will become clear as we proceed, I contend that the British Emergentists diverge in their concepts of "emergence".[11] In Parts 2 and 3 below, I will pursue a detailed examination of Alexander's notion of such property emergence, but in order to appreciate this account we first need to illuminate some of his commitments.

Although it is now too rarely noted, Alexander was a pioneer of scientific psychology in England. Alexander worked extensively in the physiology labs in Oxford for eight years in the 1880s and lectured on psychology at the same time.[12] During 1890–1891, he also traveled to Germany to study with the famous psychologist Munsterberg and subsequently published about his work

(Alexander 1892). And Alexander continued his psychological lecturing, research, and publication (see for example Alexander 1911), throughout most of his life. This scientific activity partly explains Alexander's commitment to a metaphysics heavily informed by the findings of the sciences. And given this first hand experience in psychology and physiology it is unsurprising that Alexander argues that the properties of psychology, and other higher level properties, are causally efficacious.

For example, after explaining how his account of emergent properties applies to consciousness, Alexander tells us:

> The doctrine [of epiphenomenalism] is not merely to be rejected because it supposes something to exist in nature which has nothing to do … a species of *noblesse* which depends on the work of its inferiors, but is kept for show and might as well, and undoubtedly would in time be abolished. It is to be rejected because it is false to empirical facts. (p. 8)

Here we see the idea that only causally efficacious empirical properties will ultimately be retained in our scientific theories. Furthermore, Alexander makes clear at the end of the passage that he contends that our empirical evidence supports the causal efficacy of mental properties and he holds similar views about other emergent, special science properties. Let us call this thesis '*Higher Causal Efficacy*' and state it thus:

> (Higher Causal Efficacy) There are higher level properties that are causally efficacious.

As a consequence of Higher Causal Efficacy, following his view that sciences focus on causally efficacious properties, Alexander argues for the necessity of what he calls "special sciences". After outlining why biological properties may be emergent, Alexander concludes:

> Accordingly I am prepared in this sense to believe that they may be right who maintain that biology must be treated as a special science dealing with its own peculiar subject of organic life … There seems to me no more difficulty in believing this than in believing that psychology is a special science dealing directly and at first hand with mental process, though all mental process is identical in the end, when the constellation is known, with its correspondent neural process. (p. 63)

Since biology, or psychology, has "its own peculiar subject" matter, in a specific set of causally efficacious emergent properties, Alexander claims it will be an autonomous "special science" and he argues such sciences will also formulate their own laws (p. 46).

The latter passage intimates the second metaphysical commitment of Alexander's that will concern us, for we see that he bluntly states that mental processes are *identical* to neural processes. And this passage consequently provides a hint of the puzzling incongruity that so many interpreters find in Alexander. Not only does he hold that the entities of the special sciences are causally efficacious, but he also takes these entities to be identical to lower level entities! For example, in a sub-section of *Space, Time and Deity* entitled "Identity of Mental with its Neural Process" Alexander states:

> Correlation is … an inadequate and misleading word to describe the relation of the mental to the corresponding neural process … In truth, according to our conception, they are not two but one. (p. 5)

Such passages are typical of Alexander writing loosely, suggesting an identity thesis of some kind, though ambiguous about whether this is merely the identity of individuals or also that of properties. But in a number of other places Alexander writes more carefully. For instance, when summarizing his general view of emergent qualities Alexander says the following:

> The emergence of a new quality from any level of existence means that at that level there comes into being a certain constellation or collocation of motions belonging to that level, and possessing the quality appropriate to it, and this collocation possesses a new quality distinctive of the higher complex. The quality and the constellation to which it belongs are at once new and expressible without residue in terms of the processes proper to the level from which they emerge … (p. 45)

This passage shows that Alexander takes new emergent *qualities*, and not merely the higher level process that instantiates them, to be exhaustively describable in terms of the lower level "processes" and their lower level properties. As he puts it, the emergent quality is "expressible without residue in terms of" the lower level. The emergent property is thus "higher level" for Alexander because it is identical to a combination of lower level qualities, i.e. putting it in his terms it is identical to "a certain constellation or collocation of motions" at the lower level.[13] This interpretation is confirmed when Alexander summarizes his view as follows:

> … whereas up to the present we have been content to treat the [emergent] quality as something which is correlated with a certain configuration of its basis, we can now, following the clue of the relation between mind and body, identify the quality with its peculiar form of body. (p. 47)

Similarly explicit commitments to the identity of higher level emergent properties and combinations of microphysical properties are peppered through Alexander's work.[14] (And Alexander does not shy away from the implications of such theses, perhaps unsurprisingly given his physiological work, for example arguing at length that mental states are consequently quite literally located in physical space (Ch. 3, vol. 1, Alexander 1920)).

Rather than a view solely about individuals, I shall therefore take Alexander to hold 'Physicalism' which also concerns properties and is defined thus:

(Physicalism) All individuals are constituted by, or identical to, microphysical individuals, and all properties are realized by, or identical to, microphysical properties.

Physicalism obviously allows for both the identity of higher level properties to microphysical properties and *also* the *realization* of higher level properties by microphysical properties. The explicit notion of realization is a recent conceptual innovation which Alexander never discusses, but using Physicalism to frame his view has a number of advantages that will become readily apparent shortly. First, as we shall see, the combinations of microphysical properties and relations to which Alexander identifies high level properties are themselves plausibly realized properties. And, second, Physicalism is widely accepted by contemporary philosophers and focussing on this thesis will consequently make it easier to connect to the concerns of recent interpreters.

I have taken care to outline the exegetical support for Alexander's commitment to Physicalism, a thesis which concerns properties, because recent interpreters of Alexander take him to hold a far narrower doctrine. For example, McLaughlin (1992)'s 'idealized' account of British Emergentists such as Alexander comprises a position under which all individuals are microphysically constituted, but where emergent properties of these individuals are *neither* realized by, *nor* identical to, combinations of microphysical properties. Similarly, Jaegwon Kim states that " ... emergentism is a form of dualism that takes mental properties to be non-physical intrinsic causal powers" (Kim 1997, p. 189). Both Kim and McLaughlin thus interpret Alexander to be like the earlier British Emergentists, such as Bain (1870), in holding a 'physicalism' only about individuals and *not* properties. Yet how can such an interpretation be defended

given what we have just seen are Alexander's explicit statements to the contrary?

As I noted in my introduction, McLaughlin states that he finds conflicting passages in Alexander and such conflicts apparently prompt recent interpreters to use a principle of charity to argue that Alexander must hold a position committed only to Higher Causal Efficacy, and not Physicalism. Such difficulties about accepting *both* Higher Causal Efficacy *and* Physicalism have recently been raised in debates in which Kim's work has played a leading role and briefly refreshing ourselves about the nature of so-called 'realization' relations allows us to appreciate such concerns.

The root idea of realization, in early debates over 'functionalist' theories of mind, is that a realizer property 'plays the causal role of' the property it realizes, but not vice versa. Using the metaphysical framework supplied by the causal theory of properties, we can thus say that realizer properties contribute powers to individuals in virtue of which some individual has the powers individuative of the realized property. We can make this notion more precise as follows:

> Property/relation instance(s) F1-Fn realize an instance of a property G, in an individual *s*, *if and only if s* has powers that are individuative of an instance of G in virtue of the powers contributed by F1-Fn to *s* or *s*'s constituent(s), but not vice versa.[15]

We should mark that realization is not a species of causal determination, for the latter is temporally extended, involves wholly distinct entities and is usually mediated by the transfer of energy and/or mediation of force. In contrast, realization is instantaneous, does not involve wholly distinct entities and is not mediated by the transfer of energy and/or mediation of force. Realization is instead an example of what we might simply term 'non-causal' determination, like the relations between the individuals bearing the part-whole or constitution relation.

Having a better grip upon the notion of realization we can now illuminate the worries about Alexander's explicit position. Recent critics argue that the nature of realization makes it ontologically profligate to take any realized property to be causally efficacious *in addition* to its realizer properties/relations. For the critics claim that, given the nature of the realization relation, we can account for *all* the causal powers of individuals simply using the contributions of powers by the realizer properties/relations of these individuals, or their constituents, rather than also as contributions from realized

properties. But we cannot account for all causal powers of individuals simply as contributions by realized properties. If we assume that the causal powers of individuals are not overdetermined, then appealing to Occam's Razor the critics argue that we should accept the existence of no more causally efficacious properties than we need to account for the causal powers of individuals. The proponent of this simple argument thus concludes that we should *only* accept that realizer properties/relations are causally efficacious and hence should take Higher Causal Efficacy to be false when Physicalism is true. Let us call this the 'Argument from Realization'.[16]

We should carefully mark that the Argument from Realization applies to properties which are identical to combinations of microphysical properties, for example so-called 'structural' properties (as defined by Armstrong 1978). Such structural properties are not identical to any of the particular microphysical properties/relations that 'compose' them. But what then is the relationship between microphysical properties and these structural properties? Physics tells us that structural properties are not themselves ontologically fundamental and, given our points about the nature of realization, we can see that combinations of properties, such as structural properties, are plausibly *realized* by fundamental microphysical properties/relations, such as spin, charm, charge, etc. As a consequence of this point, we can see why taking Alexander to hold Physicalism, concerned as it is with relations of identity *and* realization, is appropriate – for the "constellations" of lower level properties he takes to be identical to higher level properties are themselves ultimately realized by the fundamental microphysical properties and relations. Given the latter point, Alexander's identity claims implicitly entail that most higher level properties are realized and this leaves him with a view very like Physicalism – a position where all properties are ultimately realized by, or identical to, fundamental microphysical properties. Just as importantly, we must also mark that the Argument from Realization consequently entails that such "constellations" of properties or structural properties, and any higher level properties which are identical to them, should also not be taken to be causally efficacious, for they too are realized properties.[17]

Obviously the Argument from Realization provides a ready explanation of why interpreters like Kim and McLaughlin have charitably reinterpreted Alexander as an anti-physicalist who holds only Higher Causal Efficacy.[18] And McLaughlin also provides the most sophisticated, and widely accepted, anti-physicalistic interpretation

of the British Emergentists as taking such unrealized emergent properties to be "configurational forces", that is "*fundamental* forces that can be exerted only by certain types of configurations of particles, and not by any types of pairs of particles" (McLaughlin 1992, p. 52. Original emphasis). As a result of such reinterpretations, the position of the idealized British Emergentist is indeed logically coherent, since the Argument from Realization has no application to such unrealized emergent properties. (And McLaughlin also makes an important point in showing that such a position need not conflict with empirical results about the conservation of energy, for he argues one may posit potential energies only actualized in configurations). Nonetheless, McLaughlin eloquently argues that we should still reject the views of his idealized British Emergentist, since he then further argues that their position is highly implausible given our *empirical* evidence (McLaughlin 1992, pp. 89–92). For we do have strong evidence in support of Physicalism, since we now believe that there are only four (possibly three) fundamental forces, all microphysical in nature. Most contemporary philosophers consequently follow McLaughlin in concluding that, under this anti-physicalistic interpretation, although logically coherent the positions of the British Emergentists, including Alexander, are rightly rejected on the basis of our scientific evidence.

2. THE NATURE OF MICROPHYSICAL PROPERTIES, EMERGENCE AND ALEXANDER'S SOLUTION

In this section, I shall now begin to argue that the standard interpretation of Alexander as an anti-physicalist is mistaken. Again using Alexander's texts, I will show that he was well aware of the problems facing a position combining Physicalism and Higher Causal Efficacy. More importantly, I will then outline in detail the sophisticated metaphysical position that Alexander explicitly constructed to *resolve* such apparent problems and also to provide a novel account of the nature of the special sciences.

It is somewhat ironic that Alexander was apparently well aware of the kind of problems, highlighted by the Argument from Realization, which so trouble his contemporary interpreters. For continuing his discussion of emergent properties, and whether special sciences are needed to study them, Alexander states:

> If the study of life is not one with a peculiar subject-matter, though that subject-matter is resoluble without residue into physico-chemical processes, then we should be compelled ultimately to declare … psychology to be a department of physiology, and physiology of physics and chemistry … (p. 63)

Here Alexander implies that the subject-matter of the special sciences accords with the truth of Physicalism, since its "subject-matter is resoluble without residue into physico-chemical processes". And he further argues that we should only accept that there are legitimate special sciences if their subject matter can also be shown to be "peculiar" – where such "peculiarity" must presumably involve their properties being causally efficacious. But if there is no such "peculiarity", then in principle Alexander states that the properties, and laws, of physics and chemistry would fully suffice to capture the nature of the universe – a clear recognition of the motivations underlying the Argument from Realization.

Alexander's appreciation of just the difficulties that motivate the charitable reinterpretations of his work raises the suspicion that something is awry. This suspicion is deepened when one finds that Alexander is ultimately unmoved by such considerations because he articulates a richly detailed metaphysical account of the "peculiarity" of emergent higher level properties, and perhaps more importantly the "peculiarity" of their microphysical realizers, that he apparently believes ameliorates such difficulties. As far as I know, this account, based primarily upon a particular conception of microphysical realizers and a linked account of property emergence, has received little attention from Alexander's interpreters, both past and present.[19] In the remainder of this section I will therefore focus on articulating the central ideas of Alexander's novel view using extensive quotation from his texts. Then, in Part 3, I will defend the coherence of the resulting position.

The following summary of Alexander's account of emergent properties is given prior to a comparison of such properties with his notion of deity. Discussing the emergent property of consciousness, Alexander tells us:

> … physiological complexes of a sufficient complexity carry mind or consciousness. They may be said to be 'transformed' in the consciousness they carry. This is the empirical fact. But in the complex which thus acquires a new quality the parts retain their proper character and are not altered. The physiological elements remain physiological. So does the complex of them; though it is also psychical, it is not merely physiological but something empirically new … the parts are used up to produce something different from them and transcending them, but, used

up as they are, they are not altered or superseded but subserve. In this special sense there is a 'transformation' of the parts in building up a higher existence, but the parts remain what they were. (p. 370)

What is this odd "transformation" that the lower level parts and their properties undergo when they realize an emergent property, but which does not "alter" them and leaves them in some sense the same? I suggest that Alexander's central ideas about the metaphysics of property emergence are as follows. In a microphysical aggregate with an emergent property instance, H, the microphysical realizer properties are slightly *transformed* in their contributions of causal powers, or their "behaviors" as Alexander sometimes puts it. The transformed microphysical property instances still are the same properties, there has been no 'qualitative' microphysical change, for the broad range of causal powers that the properties contribute remains the same. And these "transformed" microphysical property instances realize a new higher level 'emergent' property instance – a microphysically realized property not previously found at lower levels of aggregation which lack the powers of the "transformed" microphysical properties. Most importantly, as we will shortly see, Alexander assumes that it is this new "emergent" property instance H that is itself responsible for non-causally determining that the "transformed" realizer microphysical property instance contributes slightly different powers when realizing H.[20]

This is the heart of Alexander's concept of an "emergent" property, as I shall further illuminate below: A realized property instance that partially, non-causally determines some of the contributions of causal powers of its realizers. Although Alexander never explicitly defines his notion of emergence we can thus frame his notion more precisely as follows:

A property instance X is emergent, in an individual *s*, *if and only if* (i) X is realized by microphysical properties/relations; and (ii) X partially non-causally determines some of the causal powers contributed by at least one of the microphysical properties/relations realizing X.[21]

This account of property emergence is obviously underpinned by what we might loosely call Alexander's 'conditioned' view of the contributions of causal powers by microphysical realizers under which some of these contributions are only made under certain conditions, crucially when the microphysical properties realize certain higher level properties. The conditioned view, and associated account of property emergence, are the back-bone of Alexander's position

on the causal efficacy of higher level properties, the implications of identities, and also the nature of the special sciences. To illustrate its nature and strengths, I will briefly unpack each of these strands of Alexander's position beginning with the efficacy of higher level emergent properties.

Recall that the Argument from Realization apparently shows that Physicalism chokes-off the causal efficacy of higher level properties. For if a realized property contributes a causal power to an individual, this will either overdetermine the individual's powers, duplicating a power already accounted for by microphysical powers; or will violate Physicalism by being a non-physical power located outside the web of microphysical powers. It thus seems to many that Physicalism therefore constitutes a metaphysical prison for higher level properties that isolates them from any efficacy. The microphysical realizer properties lock away any chance to be causally efficacious through their unconditioned, and hence homogeneous, contributions of causal powers across contexts. For these unconditioned contributions of powers leave no way in which realized properties may determine the contribution of powers by microphysical properties and hence no way in which realized properties may be efficacious when Physicalism is true. However, Alexander obviously rejects the notion that the microphysical realizers are unconditioned, and hence homogeneous, in their contributions of powers and we can thus begin to see why he believes his position can be as stringent a view as Physicalism, whilst still allowing Higher Causal Efficacy to be true.

To illustrate these points, consider how Alexander more precisely characterizes the nature of emergent properties as follows:

> If … the processes of a particular level are represented as *a* processes, a constellation of such processes is of such a kind as to be a new process *ab* with its quality B. That is, the thing which is based on that constellation of *a* processes has an emergent quality B, whose behaviour consists in *ab* processes; and though *ab* processes are also *a* processes they are not merely such, and are on a different level from the processes which are … merely *a* processes. (p. 46)

Alexander's idea is thus that an emergent higher level property like B may be causally efficacious in virtue of its role in partially determining that one, or more, of its realizers contributes causal powers beyond those it would otherwise contribute. That is, the realizer(s) of B does not merely contribute the powers of an "*a*" process, but those of an "*ab*" process. As a result, we must posit such emergent

higher level properties as B in order to account for some of the causal powers of individuals, i.e. the powers contributed by microphysical properties only in "*ab*" processes. However, Physicalism is still true, for the emergent higher level property is still realized since all of its powers result from powers contributed by microphysical properties. For B is only causally efficacious through partially non-causally determining some of the powers contributed by its realizers – these realizers and B are thus joint causes of the effects that result from the powers contributed by the realizers as a result of B's non-causal determination.

As the latter illuminates, the option that is missed by the Argument from Realization, and which apparently leaves it invalid, is that a property instance can be efficacious by determining the contributions of powers by other property instances and not solely by itself contributing powers. Alexander is fully aware of this further possibility and the originality of his view lies in its simultaneous acceptance of the monopoly microphysical properties, such as forces or energies, have with regard to the *contribution* of the fundamental powers. But coupled with a rejection of the implicit assumption that microphysical properties also have a monopoly on the *determination* of the powers contributed by these fundamental microphysical properties. Alexander denies that instances of microphysical properties contribute the same powers under all conditions and thus has the space to argue that although realized properties contribute no fundamental powers, nonetheless these properties are efficacious by partially determining the contributions of powers made by their fundamental microphysical realizers. Alexander consequently does not need to posit non-physical forces, energies, or any other type of non-physical power, in order to defend Higher Causal Efficacy and hence can continue to endorse Physicalism.

We can further illuminate Alexander's position by focusing on his seemingly hopeless claim that causally efficacious, emergent properties are identical to combinations of microphysical properties. In a more detailed passage on emergent properties in *Space, Time and Deity*, Alexander writes as follows:

> As we pass from one level to the next higher, we find that a portion of an existent on that level is set aside to be the bearer of a new characteristic empirical quality which is distinctive of the next level, and between the specialized body of the lower and the characteristic of the higher level there is identity in the same sense as a mental process is identical with equivalent neural process. (p. 334)

Here we again find Alexander espousing a property identity thesis and not merely a thesis about individuals. But we also begin to see how his conditioned view of the microphysical realizer properties gives a novel slant to such an identity thesis. For the emergent property is identical to a combination of "specialized", or "transformed", microphysical realizer property instances. Some of the instances of these microphysical realizer properties are "specialized" or "transformed" in the further causal powers that they contribute to the individual when realizing an emergent property. These instances of realizer properties are thus "set aside" from other instances of the very same properties and only they are able to realize the emergent property. Furthermore, the emergent property partially determines their contribution of causal powers. The emergent property instance, i.e. the combination of realizers, thus still plays a distinct metaphysical role in the world over and above its particular microphysical realizers. For through its determination of its realizers' contribution of causal powers the emergent property, whether a structural property or combination of realizers, is thus far from inefficacious. Contrary to one strand of received philosophical wisdom, deriving from the Nagelian model of reduction, given Alexander's framework the identity in which the emergent property is involved does not undercut the efficacy of such a realized property instance.[22]

The idea of "specialized" lower level property instances also grounds Alexander's position on the status of special sciences, and their laws, as well as his views about the fundamental laws. Throughout his work, Alexander says very little indeed about laws, focussing instead upon properties and their relations. But he does tells us that:

> The higher quality emerges from the lower level of existence and has its roots therein, but it emerges therefrom, and it does not belong to that lower level, but constitutes its possessor a new order of existent with special laws of behavior. (p. 46)

As we saw earlier, Alexander accepts that special sciences are needed only if their subject matter is "peculiar". The metaphysical position we have now illuminated provides Alexander's account of the "specialized" and "peculiar" nature of the phenomena studied by special sciences, as well as his view of these sciences themselves. With regard to properties, we have now found that emergent higher level properties are "peculiar" in being realized property instances

individuated by new powers, which result from the powers of their realizers, where the microphysical realizers are themselves "peculiar" in contributing slightly different powers when realizing emergent properties than they do in other conditions. Associated with this position there is a clear notion of special science laws. Such laws in the special science are necessary because they concern the emergent property that results from the "specialized" behaviors, i.e. the powers only contributed by realizer properties under the condition of realizing the emergent property.

It is important to mark that Alexander also implicitly makes a choice between two distinct options about the nature of the fundamental laws.[23] These are what, following Alexander's terminology, we might call the 'supercessional' and 'supplemental' options. On the former view, some of the fundamental laws governing the contributions of causal powers by microphysical properties in simple aggregates are *superceded* by new fundamental laws when these microphysical properties realize emergent properties and thus some laws holding of microphysical properties in simple systems only hold in such systems. In contrast, on the latter supplemental account, all the fundamental laws holding of microphysical properties in simple systems hold universally. But in some complex aggregates these laws are *supplemented* by further fundamental laws modulating the contributions of casual powers of the microphysical properties in ways consistent with, but not captured by, the laws holding in simple systems. The supplemental fundamental laws concern the powers only contributed by microphysical properties when realizing certain emergent realized properties.

It appears that Alexander favors the supplemental view of the fundamental laws given his talk of lower level properties remaining "*a* processes" but at the same time being something further in "*ab* processes". Furthermore, Alexander also tells us that the "specialized" realizer property instances involved in an emergent property instance are such that:

> ... the parts are used up to produce something different from them and transcending them, but, used up as they are, they are not altered or superseded but subserve. (p. 370)

Thus the "specialized" instances of certain lower level realizer properties apparently contribute all the causal powers contributed by instances instantiated elsewhere, but the determinative role of the emergent property means the causal powers of the "special-

ized" instances are supplemented by a few extra powers. The same fundamental laws thus still hold of the microphysical realizers, but further supplemental fundamental laws also govern their behavior when realizing emergent properties.

Against this background, we may now explain why Alexander's own solution to the problems facing his view has been so puzzling to interpreters, both past and present. A number of internal reasons will be apparent to the reader. First, Alexander did not have access to tools such as the causal theory of properties, or the notion of realization, with which to frame the issues, or articulate his ideas, and so his discussion and views very often lack precision. Second, partly as a result of the latter point, Alexander's prose is often turgid and very difficult to understand. And, lastly, we should not discount the fact that Alexander's metaphysics is complex, highly integrated and strikingly novel. These internal factors combine to make the heart of Alexander's emergentism rather daunting and, given the *prima facie* plausible arguments that such a position is incoherent, one can thus easily see why the core of Alexander's solution has proven so difficult for interpreters and received little detailed attention.

In addition, we can also identify an external reason for such puzzlement, since Alexander's position implies the falsity of a doctrine widely held by contemporary philosophers. This thesis is what I earlier termed the '*Completeness of Physics*' which we may frame as follows (after Papineau 1993):

(Completeness of Physics) All microphysical events are determined, in so far as they are determined, by prior microphysical events and the laws of physics.

In its reference to "laws of physics", the Completeness of Physics is intended to concern simple laws that directly refer only to microphysical entities and which are discovered by studying isolated, simple systems of microphysical entities. Quantum mechanical theories are often taken to supply such laws and the Completeness of Physics implies that these laws suffice to determine all microphysical events, whether these events are located in simple systems or complex aggregates, in so far as they are determined. It is worth dwelling upon the Completeness of Physics and its implications, since this highlights the contrasting worldviews that configure contemporary philosophy and the philosophy of Alexander's day.

At the beginning of the 20th century, it was well known that chemical phenomena had consistently resisted microphysical expla-

nation for decades. A scientific datum for philosophers of the time was, for example, that neither the general features of the periodic table, nor the specific properties of chemical molecules such as Sodium Chloride, could be microphysically explained (see Mill 1843; Bain 1870; Broad 1923). A key part of the intellectual *zeitgeist* of Alexander's period was therefore that theses like the Completeness of Physics were plausibly false, although a range of compositional evidence supported the truth of Physicalism, for example evidence that various higher-level properties and relations non-causally result from microphysical properties and relations such as the physical forces.

For a philosopher like Alexander, one of the obvious philosophical projects was thus to provide an explanation of how Physicalism could be true whilst the Completeness of Physics was false. And Alexander appears to have been successful in such a project, since under his view not all microphysical events are determined, in so far as they are determined, by prior microphysical events and the laws of physics. For, with Alexander's position, there will be microphysical properties whose contribution of causal powers are partially determined by realizing emergent properties and any events caused by such powers will not be wholly determined by microphysical events. The Completeness of Physics is thus false, since some microphysical events will be partially determined by emergent higher level properties and the fundamental supplemental laws associated with them. Nonetheless, Physicalism still appears to be true under Alexander's view, since all the powers of such emergent properties result from powers contributed by microphysical properties and such emergent properties are therefore all microphysically realized properties.[24]

If we turn our attention back to our own time, then we can consequently see why Alexander's ideas may have proven so elusive to present interpreters. As a result of the success of quantum mechanics, and other scientific achievements of the 20th century, many analytic philosophers now accept the truth of the Completeness of Physics and it inclines them to a very different view from Alexander's, particularly of microphysical properties. Recall that the Completeness of Physics implies the same set of laws that describes simple systems suffices to determine microphysical properties *wherever* they are instantiated, whether in simple systems or complex aggregates. This promotes the ideas that the contributions of causal powers by microphysical properties are captured

by such laws and are everywhere the same. By its nature, the Completeness of Physics thus makes it all too easy to assume that (a) the microphysical entities are unconditioned, and hence homogeneous, in their contributions of causal powers and (b) that such contributions are determined, in so far as they are determined, only by other microphysical properties.[25] As our work in this sections shows, claims (a) and (b) conflict with central elements of Alexander's emergentism which presupposes that microphysical properties are *conditioned* in some of their contributions of powers; and that emergent higher level properties often determine the contributions of powers by the fundamental microphysical properties. If the Completeness of Physics were a fundamental part of ones *weltanschauung*, then we can see why one might have great difficulty in appreciating Alexander's position with its opposing implications.

3. NON-CAUSAL DETERMINATION, CONDITIONAL POWERS AND METAPHYSICAL VINDICATION

The largely exegetical arguments of Parts 1 and 2 show that Alexander explicitly defended a novel, sophisticated physicalist position. But obviously these arguments do not show that Alexander *ought* to be interpreted as I have suggested, for considerations of charity may still weigh heavily if the position I have argued Alexander explicitly endorses is indeed incoherent. In this section, I shall therefore consider whether the detailed metaphysics underlying Alexander's emergentism is logically coherent focusing primarily upon the challenge posed by the Argument from Realization and two prominent objections to the type of position I have ascribed to Alexander.[26] (Given this focus, I should note that I will not provide concrete cases of properties that might satisfy Alexander's account. Providing such examples is a project that should not be taken lightly and will be a large endeavor involving careful examination and interpretation of evidence from the sciences. Here I will only attempt the equally important task of rebutting arguments that Alexander's view is logically incoherent).

As a framework for providing a more precise metaphysical account of Alexander's ideas, I will use Sydney Shoemaker's notion of a "conditional" causal power in the case of realizer and realized properties. In his (1980), Shoemaker pointed out that many properties contribute their causal powers "conditionally". The property

of being knife-shaped illustrates his point. When this property is instantiated in an individual with the properties of being made of steel and being knife-sized, then an instance of the property contributes a set of causal powers resulting in an individual that cuts flesh. But when instantiated in an individual with the properties of being made of wax, or being of microscopic size, then an instance of the property of being knife shaped contributes a set of causal powers that does not result in an individual that cuts flesh. Wax, or minute, knives don't cut. Shoemaker thus argued that properties may have "conditional" powers, that is powers they contribute to individuals only conditionally upon the presence of certain other properties.

Obviously, Alexander's conditioned view of the microphysical realizers of emergent properties has strong affinities to Shoemaker's more general idea of a conditional power, for it appears Alexander takes microphysical properties to contribute some powers *conditionally* upon their realizing certain higher level properties. I therefore want to explore whether we can provide the needed metaphysical articulation, and evaluation, of Alexander's emergentism by using Shoemaker's framework of conditional powers applied to the special case of realized properties and their realizers.[27] This project is of interest in its own right, since to my knowledge no one has explored such relationships in detail. However, here I merely focus upon a case relevant to Alexander where a higher level property is identical to a combination of microphysical properties and relations, where this combination of properties and relations is in turn realized by particular fundamental microphysical properties and relations. Most importantly, I will assume that at least one of the fundamental realizer properties involved in such a combination is such that it has a 'conditional' power whose contribution is partially determined by the property it realizes.

Let us therefore consider a scenario where the ontologically fundamental microphysical properties/relations, 'P1', 'P2', 'P3' … 'Pn', instantiated in microphysical individuals '*a*1', '*a*2', '*a*3' etc., realize an instance of a property 'H' in '*s*', where *s* is constituted by *a*1, *a*2, *a*3, etc. (Obviously not every microphysical individual has each of these microphysical properties/relations, but I spare the reader the details since these will be irrelevant for my purposes). The particular situation I want to examine is the one Alexander outlines where the instance P1, a microphysical realizer of H in *s*, contributes one of its causal powers to individuals only *conditionally* upon realizing an instance of H. Let us call this conditional power 'Cx' and take it to

be the power to cause some microphysical effect 'Pz'. We are thus assuming that Cx is different from any of the powers an instance of P1 contributes when not involved in realizing H.[28]

Our first question is whether Higher Causal Efficacy is true in this novel situation? It is plausible that it is. The property H partially non-causally determines the contribution of a causal power to an individual, since P1 only contributes Cx to individuals when realizing H. Assuming that P1 is instantiated in *a*1, then *a*1's having Cx is accounted for only by ascribing the realized property H to the individual *s* that *a*1 constitutes. The power Cx is contributed by the microphysical property P1, but the crucial point is that, in the particular circumstances, H is a necessary member of the properties which are only jointly sufficient for determining the contribution of Cx to *a*1. And, as a result, H and the relevant realizers are hence *joint* causes, putting it roughly, of any effects produced by Cx. In this situation, there is thus good reason to believe that Higher Causal Efficacy holds true.

An obvious question arises at this point. Why is H the candidate for determining the contribution of the conditional causal power in question, rather than the combination of microphysical properties and relations P1, P2, P3, ..., Pn? Under Alexander's position there is an equally obvious response: the *combination* of microphysical properties is not an *alternative* to the emergent property instance H, since Alexander identifies the emergent property instance and the combination of realizer property instances. Furthermore, the key point to remember is that a combination of microphysical properties and relations is a *realized* property instance. The question at issue is whether such a realized property, rather than merely component microphysical realizer properties, can ever be causally efficacious. Hence we can see that Alexander's account would be successful in securing Higher Causal Efficacy even if the combination of microphysical properties is taken to be responsible for determining the powers in question.

Alexander is aware of the distinctive implications of his identity-based account, as I noted in Part 2, for example he writes as follows:

> Mind is thus at once old and new. No physiological constellation explains for us why it should be mind. But at the same time, being thus new, mind is through its physiological character continuous with the neural processes which are not mental. It is not something distinct and broken off from them, but it has its roots or foundations in all the rest of the nervous system. (p. 8)

The metaphysical framework of conditional powers allows us to more precisely explicate the ideas here. Taking the latter point first, an emergent property is exhaustively realized by microphysical properties, for such an emergent property is identical to a combination of such properties which is itself realized. But the emergent property is not metaphysically "nothing but" the realizers. For no *merely* microphysical set of properties by themselves account for the causal powers contributed by this combination of properties to individuals. Only by taking the lower level properties to be 'new' in realizing H, i.e. the emergent property instance, can we account for certain of the powers of the new "constellation" of microphysical properties. Thus, in such a case, a realized property like H, albeit one identical to some combination of lower level properties and relations, can be a necessary member of a set of properties that are only jointly sufficient for contributing a certain causal power, in Cx, to an individual such as $a1$. Higher Causal Efficacy therefore holds true in such a case of identity.

What of Alexander's other commitment – is Physicalism also true in the situation sketched? The key issue is whether the emergent property instance H is realized and focusing upon the non-causal nature of the determination exerted by the instance of H shows that it is indeed realized in this case. The central point that we need to emphasize is that H is *not causing* P1 to contribute certain powers. H is exerting a *non*-causal determinative influence and, as with part-whole or realization relations, this does not involve the exertion of a force and/or transfer of energy. Although P1's contributing the causal power Cx is partially determined by its realizing H, the causal power Cx is nonetheless *still* a causal power contributed by a microphysical property, in this case P1. We can therefore see that all the causal powers of s, and its constituents $a1$, $a2$, $a3$, etc., are still had solely in virtue of the powers contributed by microphysical properties/relations. (Although, of course, that the power Cx is contributed is *not solely determined* by P1–Pn, but also by the instantiation of H). Consequently, H is still a realized property, where its realizers are P1, P2, P3, ..., Pn, and Physicalism holds true – for H, and other emergent properties, are realized property instances characterized by powers which all result from the powers contributed by microphysical properties.

As I argued in Part 2, Alexander can thus apparently accept that there are no more than four (or three) fundamental forces which are all microphysical in nature. For his crucial idea is that microphysical

properties, such as these few forces, contribute some of their causal powers only when realizing higher level properties. Nonetheless, a common concern, echoing McLaughlin's widely endorsed critique, is that even under my interpretation Alexander's position must still somehow be committed to fundamental non-physical forces. First, there is a blunt objection that instances of new forces must be involved in realizing Alexander's emergent properties. For we have instances of realizer properties which do not contribute exactly the same powers as instances of the microphysical forces under other conditions and, concludes the objection, such "transformed" realizers must be new fundamental forces. In response to this concern we should note the overwhelming overlap of causal powers between the property instance in the scenario in question and P1. Consequently, given the vast overlap in powers between the property instances found realizing emergent instances, and those instances of P1 found elsewhere, considerations of ontological parsimony force us to say that the realizer instances are also instances of the microphysical property P1 (cf. Shoemaker 1980). Thus it is plausible that in the broached scenario the same fundamental microphysical properties, including forces, would still exist when realized properties partially, non-causally determine their contributions of powers. This blunt objection thus fails to show that Alexander must be committed to fundamental non-physical properties, including forces.

A second worry of this kind is directly based upon McLaughlin's notion of fundamental, non-physical, *configurational* forces. This objection first notes that, crudely put, a force is simply something that changes the motions of masses. But, on my interpretation of Alexander, emergent properties are therefore forces, since their causal efficacy means they plausibly change the motions of masses if Physicalism is true. And such "forces" only arise in certain aggregations or "configurations". Thus even on my account, concludes the objection, Alexander is therefore committed to non-physical "configurational forces" of just the type McLaughlin claims. Similar points can also easily be made about the existence of non-physical energies or what Kim terms "non-physical intrinsic causal powers".

Unfortunately, this type of objection is apparently based upon a slide from a mundane use of "configurational force" as almost synonymous with 'higher-level cause' to a far stronger use as meaning '*ontologically fundamental* force'. We should first note that if one accepts that Physicalism is true, then all causal effects will involve

microphysical changes and very often changes in the motions of masses. Consequently, if one holds that a realized property like H is causally efficacious, then it will be likely that one will take events that instantiate H to change the motions of masses in virtue of this property. In this sense, anyone endorsing Physicalism, and a thesis like Higher Causal Efficacy, will take higher level properties to be "forces" in this weak sense. An emergent realized property instance might even be termed a "configurational force" in the weak sense, since it will change the motions of masses and is only instantiated in aggregations.

Crucially, however, the second point to mark is that such a commitment does *not* entail that such a higher level property is itself an ontologically *fundamental* force. For we have now seen that under the "conditioned" picture an emergent realized property instance may be a joint cause of some change in the motions of masses solely through the mediation of the fundamental microphysical forces and their contributions of powers which this emergent partially, non-causally determines. All of the powers of such an emergent property completely result from powers contributed by microphysical properties. Consequently, like all other realized properties, such an emergent property instance is an ontologically *derivative* entity. Such emergent realized properties may thus be termed "forces", in the weak way that any higher-level cause in a physicalist world will be a "force", but such a properties will *not* therefore be ontologically fundamental entities – whether fundamental configurational forces, or powers, or energies, or any other type of fundamental entity. Although our scientific evidence shows that fundamental configurational forces plausibly do not exist, as McLaughlin plausibly argues, this therefore poses no problem for Alexander's view, since he is plausibly committed to no such forces.

Again, Alexander himself was apparently aware of these resources of his account for answering such concerns. He says the following about energy, though the point holds equally for forces and powers:

> Energy is an empirical quality of matter and does not belong to mind or life. Yet it is easy to interpret the phrases 'vital' or 'mental energy' as the energy of the material equivalents; and in this way, be it observed, the difficulties of the application of the conservation of energy to life and mind disappear. For we have no need to think of any entity soul interfering, with its own peculiar energy. (p. 71)

Here we see a reiteration of Alexander's commitment to the idea that the contribution of powers by microphysical properties mediates the causal efficacy of emergent higher level properties, rather than choking it off. And Alexander allows a 'weak' use of terms such as 'mental energy' (and presumably 'mental force'), but crucially with the proviso that he asserts that such 'mental energy' is ultimately only "the energy of the material equivalents". Alexander is thus careful about his commitment to Physicalism, making the point that I have just emphasized that all fundamental energy (and, similarly, forces) will be microphysical in nature, or "material" as he puts it. Contrary to the common concern, the metaphysical structure of Alexander's emergentism, when properly understood, does not imply the existence of any fundamental forces, energies or powers that are non-physical in nature.

Another important type of objection to Alexander's emergentism is more metaphysical in nature. This concern focusses on the determinative relation between an emergent property and its realizer properties, and has recently been raised against similar positions by Kim (1999, pp. 28–31). With a view of the type I have ascribed to Alexander, this kind of objection proceeds roughly as follows: Can one explain, asks the objector, *how* the property instance H could determine the nature of the "transformed" instance of the microphysical property P1, i.e. an instance contributing Cx, that is a necessary component of H, or *vice versa*? For, the objector argues, it appears that H needs to exist *prior* to the "transformation" of P1 to determine its nature, and yet H is only brought into existence *after* this transformation has occurred! Similarly, the "transformed" P1 would have to exist *prior* to the instantiation of H to realize an instance of this property, and yet the "transformed" P1 again would only be brought into existence *after* the instantiation of H. Whether the instance of H precedes the "transformed" instance of P1, or P1 precedes H, the situation is equally impossible. Since these are the only options, concludes the objector, this type of emergence is not logically possible.

It should be clear that a crucial assumption of this type of objection is that there is a *causal* determination relation holding between the instances of P1 and H in our scenario, since the objection assumes this determinative relation is temporally extended. However, this assumption is highly contentious, since we have seen there is strong prima facie evidence that there is another, and very different, kind of determination in cases of parts and wholes or

realized and realizer properties. These cases all involve relations of non-causal determination which are not temporally extended, do not occur between wholly distinct entities and do not involve the transfer of energy and/or mediation of some force. Furthermore, Alexander is very explicit that the relation between emergent properties and their realizers, what he calls the "corresponding" processes, is not a causal relationship. In discussing how to think of mental causation under his view, Alexander tells us:

> Just as we continue to speak of sun-rise and sun-set, though it is the earth that revolves, so we may continue to say *under a certain proviso* that the mind, as in an act of will, acts upon the brain directly and produces indirectly movements of the limbs; … The proviso under which such language is permissible is that no brain process shall be understood to cause its corresponding mental process and no mental process its corresponding brain process. (p. 12. Original emphasis)

Alexander thus explicitly takes an emergent property instance's "direct" determination of its realizer properties' contribution of causal powers to be a *non-causal* determinative relation. As a result of this non-causal determination, Alexander argues that the mental property will cause bodily movements "indirectly" *through the mediation* of the causal powers contributed by the realizers whose contribution of powers the mental property instance partially non-causally determines. Consequently, just as with any non-causal relation, for Alexander the determinative relation between the instances of P1 and H is plausibly *instantaneous* in nature. And Alexander may thus respond to the metaphysical objection by arguing that it is based on something close to a category mistake in asking whether the relevant instance of P1, or that of H, exists first.

Let me summarize the conclusions of this section. My primary goal was to assess the logical coherence of the physicalist position I earlier attributed to Alexander. One may establish that a set of statements is logically coherent by trying to conceive of a situation, using a conceptual representation, in which these statements are all true. And with the scenario outlined in this section, we have successfully outlined just such a representation in which Higher Causal Efficacy and Physicalism are both true, and we have therefore established the prima facie logical coherence of the novel physicalist view I have attributed to Alexander. We have also seen how Alexander's emergentism, when properly understood, has the resources to answer two of the most prominent types of objection to it. The work of this section thus shows that the Argument from

Realization is invalid: simply because property instances are realized this does not entail that these instances are not efficacious. For our work establishes that in some situations involving realized properties we *cannot* account for the powers of all individuals solely using realizer properties, since we may have to posit realized properties to account for some of the powers contributed by the realizers themselves. Contrary to Kim, McLaughlin and others, we therefore need not apply a principle of charity to Alexander's texts and may take him at his word as holding a novel position combining Higher Causal Efficacy and Physicalism.

4. ALEXANDER'S LEGACY

It should be clear that Alexander's highly original brand of physicalism has a range of interesting implications both for historical accounts of the genesis of contemporary Australian philosophy, as Passmore suggests, and also for on-going philosophical debates. I will begin with some brief remarks on Alexander's historical role and then turn to the possible import of his ideas for ongoing debates.

In his era, Alexander was striking in having a deep commitment to serious analytic metaphysics combined with the idea that such a metaphysics should be disciplined and constrained by the findings of the sciences.[29] This singular combination of views is arguably amongst the defining characteristics of much contemporary Australian philosophy and begins to illuminate the basis for Passmore's claims. Furthermore, Alexander's physicalist account of the special sciences, and the mind-body relation, makes the interest of Passmore's claims stark. It is notable that in the second half of the 20th century, Australia became one of the hot-beds of physicalist theories of the mind-body relation, including both J.J.C Smart's defense of the type-identity theory and David Armstrong's identity-based functionalist account. In addition, as a thorough-going, scientifically oriented physicalist Alexander did not merely tackle the projects of providing accounts of the mind-body relation and the nature of the special sciences. In parts of *Space, Time and Deity* that rarely receive much attention, Alexander also took on the task of 'naturalizing' such phenomena as intentionality, free-will, and even deity, amongst others.[30] That is, Alexander pursued the project of showing how such phenomena could exist in a physicalist world of the type he

accepted. All of the foregoing features and projects have played a central role in much of the pioneering work pursued by the prominent Australian philosophers who were students of, or highly influenced by, John Anderson. Although clearly these connections need to be traced out more carefully, against the background of our physicalist interpretation of Alexander's emergentism a new significance consequently grows around Passmore's claims that Alexander was an important influence on Anderson and hence a 'grandfather' to Australian philosophy.[31]

Perhaps more importantly, turning to contemporary debates, it is also interesting to consider whether Alexander's position may offer any help with on-going problems. One of the central difficulties presently faced by physicalists is the challenge posed by the Argument from Realization, and related concerns, which putatively show realized properties, whether mental or otherwise, are not causally efficacious. For example, as a result of the Argument from Realization, and similar reasoning, Kim ultimately concludes that everything reduces to an ontologically *one*-dimensional world, containing only microphysical properties and individuals, though our *theories* and *conceptual schemes* may well be layered (Kim 1997, 1998). The many physicalists who favor a layered, non-reductive ontology thus face the challenge of responding to such arguments.

Alexander's emergentism is obviously relevant to this issue, for it incorporates Physicalism, accepting as it does that all higher level properties are microphysically realized, yet nonetheless allows for a 'patchwork' of causally efficacious properties. (As I have suggested elsewhere, the position is aptly termed 'Patchwork physicalism').[32] Alexander's view is committed to a mosaic of fundamentally determinative, and thus causally efficacious, properties, including not just the fundamental microphysical properties, but also the higher-level emergent realized properties with which the microphysical properties often share the determination of fundamental causal powers. And the patchwork metaphor also nicely captures the nature of the wider ontology that results from Alexander's physicalist view. In contrast to Kim's ontologically reductive view, Alexander's brand of physicalism implies there is a patchwork of higher and lower level properties, in a 'layered' hierarchy, bearing realization relations to each other, and also a hierarchy of individuals instantiating these distinct emergent properties. Alexander's sophisticated physicalist position therefore *preserves* a layered physicalist universe through its patchwork of emergent realized properties.

At this point a common worry is that Alexander's view is incompatible with the truth of the Completeness of Physics which, as I earlier noted, is presently endorsed by many contemporary physicalists.[33] However, after we reflect upon the very strong conclusions that we have found to result from combining the Completeness of Physics with Physicalism this may not be such a great price for physicalists to pay. For our work in this paper provides a compelling case that the Completeness of Physics and Physicalism *together* do indeed entail that Higher Causal Efficacy cannot be true.[34] In the face of these difficulties, I suggest that Alexander's emergentism is of continuing significance, since it shows that contrary to the received wisdom there are actually *two* coherent options for physicalists to choose between.

On one side, there is the ontologically reductionist position, favored by Kim in his pessimistic moments, which embraces both Physicalism and the Completeness of Physics, but which rejects Higher Causal Efficacy and the efficacy of our own mental properties, as well as those of the special sciences generally. But on the other side are physicalist views like Alexander's that posit the existence of the type of emergent realized properties we have illuminated and which hence endorse both Physicalism and Higher Causal Efficacy, allowing a space for mental, and other realized, properties to be causally efficacious, whilst rejecting the Completeness of Physics. Assessing whether we have more evidence for one or the other of these physicalist options is a large, and difficult, question which as I noted above involves the careful re-assessment of our empirical evidence from the full range of scientific areas. We have only just begun to address such issues and it is presently far from obvious whether our present evidence favors an ontologically reductionist physicalist view endorsing the Completeness of Physics, or a non-reductive physicalist position like Alexander's that preserves a layered world with efficacious higher level properties whilst abandoning the Completeness of Physics. Alexander's emergentism thus appears to be of central importance for contemporary non-reductive physicalists, since it offers one of the few possible ways such philosophers can defend their commitments.

To conclude, far from being an embarrassing 'crazy uncle' who is best ignored, as most Australian and other contemporary philosophers apparently now assume, we have seen that John Passmore is right after all in his view that Alexander is a respectable 'grandfather'. For Alexander's emergentism provides a highly original, and

seemingly live, option for anyone convinced that properties like having low-blood sugar, or being a glacier, or believing New Orleans is humid, are causally efficacious, but who also accepts that such properties are exhaustively microphysically realized. My final conclusion is therefore that Alexander's emergentism is a profound intellectual achievement that deserves to be carefully reconsidered, whether as a scholarly exercise or as a means to address some of our most pressing philosophical problems.

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NOTES

[1] Laird (1939).
[2] Passmore (1966), pp. 566, Fn. 10 and his introduction to Anderson (1962). See also Baker (1986) including Anthony Quinton's introductory remarks.
[3] Lowe (1990), p. 173.
[4] Broad (1921), p. 144. The charge of "grave contradictions" is defended by Calkins (1923), p. 204 and Stout's critique is found in his (1940), p. 146.
[5] The works of the British Emergentists themselves include Mill (1843), Bain (1870), Lewes (1875), Alexander (1920), Morgan (1923) and (1927), and Broad (1923). Kim (1992) and McLaughlin (1992) basically provide the standard view of British Emergentism, and McLaughlin provides an excellent "idealized" account of British Emergentism, as he puts it, which passes over detailed differences amongst the individual Emergentists to provide a representative account of the movement (McLaughlin 1992, p. 49). (See also Blitz 1992 for a historical overview of both the British Emergentists and other emergentist movements of the twentieth century, and the other papers in Beckermann et al. 1992).
[6] McLaughlin (1992), p. 66.
[7] Passmore (1966).
[8] Alexander's emergentism is the metaphysical focus of volume 2 of *Space, Time and Deity* and I will not venture any answers about his account of "Space–Time", or any of the other metaphysical positions on the categories, offered in volume 1 of his great work. Unless otherwise noted, all references are thus to volume 2 of Alexander (1920).

[9] Note that causal efficacy is often defined simply as the actual contribution of causal powers to some individual, but I will show in Part 3 below that the possibility outlined by Alexander necessitates this wider understanding as either contribution or determination of the contribution of powers. It should also be marked that, first, I use the term 'entity' to refer to relations, properties, events, processes and individuals; and, second, though my focus throughout will be upon property instances for stylistic reasons I shall sometimes talk simply about "properties" in referring to such instances.

[10] We should note that although the material is the fundamental empirical quality, it is itself realized by the still more fundamental, and what Alexander terms "categorical", properties of motion or Space–Time. Alexander's basic idea (pp. 49–55) is that the "material" entities are the ontologically fundamental empirical qualities. He takes the material to be particles, forces, etc. of the types identified by physics and I shall follow contemporary usage, speaking of the 'microphysical' instead of the "material" entities. And I take the 'microphysical' or 'physical' to be defined in the manner laid-out in Crook and Gillett (2001).

[11] I should mark that similar points also hold for Morgan (1923, 1927) who held a closely related position to that of Alexander. However, here I will not defend this claim about Lloyd Morgan's views.

[12] Laird (1938), pp. 379–381, see also Laird (1939). One of Alexander's reasons for leaving Oxford, and moving to Manchester University, was the paucity of psychological research and teaching at the former; and as the new Professor in the Philosophy Department he was responsible for appointing the first psychologist at Manchester (Laird 1939).

[13] An alternative interpretation takes Alexander to mean realization by "identity" when he uses the latter to discuss relations between properties – thus mirroring interpretations of Fodor (1974), which take Fodor to be discussing realization though he only ever explicitly talks about "token-identity". Although this view of Alexander is worth pursuing I shall use here the more conservative interpretation outlined in defending my main points that will also carry-over to this alternative interpretation.

[14] A survey of the first two chapters of volume 2 of *Space, Time and Deity* reveals other examples, such as pp. 68–69. See also Alexander (1912), Fn. 2, p. 9, and (1914), p. 197.

[15] I should mark that the account of realization I am using is rather different than that endorsed by Kim (1997, 1998) which I have dubbed the 'Flat' view, since it demands that realized and realizer properties always both share powers and are instantiated in the same individual. In my (2002a) I provide reasons to reject the Flat view. In its place, in my (2002a) I have defended the 'Dimensioned' account as a better view of realization relations in the sciences which allows realizer and realized property to be instantiated in different individuals and to share no powers. I shall therefore use the latter account for ease of exposition, though elsewhere I have provided a still more detailed elaboration of realization in the sciences. I shall therefore also eschew notions that use the Flat view, for instance Kim's distinctions between 'orders' and 'levels' of properties.

[16] Kim has perhaps done the most to illuminate the nature of these problems in a series of papers and books (see for example Kim 1992, 1997, 1998, 1999).

Related arguments, including arguments directed at dispositional properties, are also found in Prior et al. 1982, Martin (1997) and Heil (2000), amongst others.

[17] Lycan (1987) and others have all pressed this point (see also Gillett (2002a) that offers metaphysical arguments for the claim).

[18] For similar reasons, others have charitably reinterpreted Alexander as holding only Physicalism and rejecting the truth of Higher Causal Efficacy. For example, see the writers considered in note 24 below.

[19] Neither Kim (1992) or McLaughlin (1992) address what I dub below Alexander's 'conditioned' view of microphysical realizer properties and the associated account of property emergence. Similarly, in his own time, peers such as Calkins (1923) and Stout (1940) were trenchantly critical of Alexander's view, but also failed to address these ideas in the course of critiques. Notable exceptions to this trend are Emmet's (1966) and (1967), and Passmore's (1966).

[20] Given the latter aspects, and also its other features, it is interesting to speculate about the influence that Hegelian ideas, such as that of "synthesis", had upon the genesis of Alexander's emergentism, especially in light of Alexander (1896). Laird (1938) describes one of Alexander's interests as "Darwinism in its relation to Hegel", and this is certainly seen in the latter paper. In addition, C. Lloyd Morgan's influence on Alexander is intriguing, see Alexander's notes on p.14 and also Alexander (1914), p.198.

[21] There are obviously a variety of other, rather different notions of property emergence and in my recent survey of such concepts (Gillett 2002b) I call Alexander's type of view 'strong' emergence. The anti-physicalist concept of emergence favored by earlier writers such as Bain (1870) I label 'ontological' emergence. It should also be marked that under Alexander's concept it is plausibly property instances that are emergent, but for ease of exposition I will talk of emergent properties.

[22] It is worth emphasizing that the structural property, or "constellation" of realizer properties, to which Alexander identifies the emergent realized property is *itself* a realized property as I argued above. Thus the identity unsurprisingly does not block the claim that realized properties are shown under Alexander's view to be efficacious.

[23] I contend Alexander's position can be more precisely articulated by adding more detail about laws, but in order to be as true as possible to Alexander's text I shall follow his emphasis upon properties. Thus in Part 3 when I construct a more precise metaphysics to defend the coherence of Alexander's position I shall eschew laws and focus entirely upon properties and their powers, though I believe that the same points can be made when focussing upon laws, possibly more convincingly (see Gillett 2003a).

[24] O'Connor (1994, p. 94) explicitly challenges the claim that Alexander rejects the Completeness of Physics, for he argues that we must interpret Alexander as taking all higher level laws to be derivable from the laws of physics. Once again, O'Connor is apparently driven by just the concerns of charitable interpretation that motivate Kim and McLaughlin, for he accepts that Physicalism and Higher Causal Efficacy are incompatible. But whereas Kim and McLaughlin argue we must retain Alexander's commitment to Higher Causal Efficacy, whilst rejecting Physicalism and the Completeness of Physics, O'Connor argues we must accept that Alexander endorses Physicalism and the Completeness of Physics, whilst

abandoning Higher Causal Efficacy. (See also Clayton 2004 who, like O'Connor, assumes that one cannot hold both theses and also concludes that Alexander only holds Physicalism).

O'Connor's claims obviously pose an exegetical challenge to my interpretation. The remainder of the paper will detail a range of evidence to show Alexander can hold Physicalism and Higher Causal Efficacy, but not the Completeness of Physics, hence deflating the need for O'Connor's version of a charitable interpretation. In addition, however, we also have direct exegetical evidence that Alexander rejects anything like the Completeness of Physics. For example, after reiterating a point about the possibility of predicting states of Space-Time, and referring to Laplace's calculator, Alexander tells us:

> Except in the limited sense described, the hypothesis of the calculator is absurd. He is supposed to be predicting as a man, though with more than human skill. Yet if he exists at a stage earlier than the arrival of mind, he is an impossibility and, anyhow, he has not the materials for complete prediction except to the extent indicated … He stands, in fact, for little more than the proposition that at any moment of the world's existence the future of the world "will be what it will be". But what it will be he cannot foretell, for the world itself is in Time and is in perpetual growth, producing fresh combinations. (pp. 328–329)

[25] Gillett (2003a) argues at length that the appeal of the Argument from Realization derives from a confusion between the implications of Physicalism and those of the Completeness of Physics.

[26] The metaphysical framework is explored and defended at greater length in Gillett (2003a) and (2003b).

[27] I hope that it goes without saying that I have not claimed that the property of being knife-shaped is an emergent property in Alexander's sense.

[28] In fact, such a conditional power will likely be linked to many other properties, but for simplicity of exposition I will assume such a connection only between P1 and H. To be completely explicit, assuming what I called the 'supplemental' view in Part 2, the set of causal powers individuating P1 is conditionalized to the following degree: (a) When realizing H, P1 contributes Cx and C* and C** and C*** … etc.; and (b) in all other cases P1 contributes C* and C** and C*** … etc.

[29] See, for example, volume 1 of Alexander (1920) for his account of space–time and categories such as universal, individual, substance, causality, quantity, part-whole, and motion, amongst others.

[30] These accounts are contained in volume 2 of Alexander (1920). In Book III, see chapters 4–6 for his account of intentionality and various other mental phenomena; chapter 9 for his view of value, truth and error, and beauty, amongst 'tertiary' qualities; chapter 10 for his discussion of free-will. Book IV contains Alexander's sophisticated, and very interesting, account of religious sentiment and deity in a physicalist world.

[31] If such an intellectual connection does exist, then it is somewhat ironic. For a variety of reasons, Alexander's lasting philosophical influence in his primary professional home in Great Britain was minimal. Thus if Passmore is correct, then Alexander's most important intellectual legacy manifested itself back in the country of his birth and childhood.

[32] The patchwork metaphor is borrowed from Cartwright (1994), which critiques our putative evidence for the Completeness of Physics. However, Cartwright apparently assumes that if she rejects the Completeness of Physics then she also has to reject Physicalism as well. My arguments here about the coherence of Alexander's position, and elsewhere (for example Gillett 2003a, b), suggest that she *need* not abandon Physicalism in order to defend a patchwork world, though Cartwright will still be likely to deny our evidence suffices to justify acceptance of the truth of Physicalism itself.

[33] It is worth noting that Alexander's physicalism is compatible with what Fodor (1974) terms the 'Generality of Physics':

(Generality of Physics) All events that fall under the laws of any science are physical events that fall under the laws of physics.

Alexander's concept of emergence is compatible with there being fundamental laws, presumably 'laws of physics', only referring to microphysical events that hold of all microphysical entities whether in simple or complex aggregates. For, as we saw above, such laws may be supplemented by further fundamental laws, ineliminably referring to strongly emergent properties, that modulate the causal contributions of the microphysical properties in ways consistent with, but not captured by, the laws only referring to microphysical entities. Given the latter point, Alexander may argue that the Generality of Physics is a more plausible view of the comprehensive nature of physics than the Completeness of Physics.

[34] Briefly summarizing our earlier work: When Physicalism is true, then the microphysical property instances have a monopoly on the contribution of fundamental powers. But if the Completeness of Physics is true, then microphysical properties also have a monopoly on the determination of the contribution of powers by instances of the fundamental microphysical properties. As a result, since contribution of powers and determination of such contribution are the only ways to be efficacious, it highly plausible that realized property instances should not be taken to be efficacious in such a situation. (For more detailed discussion see Gillett 2003a, b).

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