no doubt come to be regarded as the definitive statement and defence of non-naturalist cognitivism.

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Emergence in Mind (Mind Association Occasional Series)
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Emergence is a hot topic today, both in philosophy and science. In the philosophy of mind, it is offered as an alternative to reductive and non-reductive physicalism, and its core thesis is, roughly, that when matter reaches a certain level of complexity it gives rise to causally autonomous novel properties that are dependent on the underlying matter yet irreducible to it. This being philosophy, there are almost as many different conceptions of emergence as there are emergentists, but one can say that generally emergentism is an ontologically monistic view in as much as the world is made of fundamentally one kind of thing, matter, but it is a property dualist position since according to it at different levels of organization and complexity matter exhibits novel properties distinct from the lower levels of organization from which they emerged. The details of how to make these two requirements of distinctness and dependence compatible is what makes emergence not only hot, but also controversial.

Emergence in science does not face such problems. In science, 'emergence' is primarily an epistemological concept, what David Chalmers (2006) calls 'weak emergence', that reflects our inability, for a number of different reasons, to predict or expect the appearance of systemic properties of a system, such as emergent patterns in cellular automata, systemic properties of connectionist networks, termite organization and traffic jams. Such weak emergence is ubiquitous in the natural world and, at least in principle, compatible with reduction since a phenomenon may be unpredictable yet also ontologically reducible.

Cynthia and Graham Macdonald are right in their introduction to *Emergence in Mind* that such emergence does not raise significant philosophical problems, and so it is the kind of 'strong', ontological, emergence that is the general theme underlying the papers in this collection. The central question concerning ontological emergence is metaphysical: can a plausible distinction be made between things

that are 'nothing over and above' what constitutes them and things that are 'something over and above' their constituent parts? So the question, really, is what sort of novelty a property must exhibit in order to be strongly emergent. The criterion usually cited, beyond mere ontological irreducibilty, is irreducible causal efficacy and specifically, downward causation. The difficulty of fleshing out how downward causation is possible in a fundamentally physical world is one of the central difficulties in giving a plausible account of emergentism and it seems to be the *leitmotif* of a number of the papers in this collection.

Emergence in Mind contains an introduction and the papers (nine main papers and replies to seven of them) presented at a conference on emergence supported by the Mind Association at Queen's University at Belfast in 2007. The introduction is readable and interesting and is divided into four sections that give some historical background, the philosophical context in which emergentism arose in the second half of the twentieth century, a brief discussion of the core debates today that arose from the anti-reductionism that Donald Davidson and Jerry Fodor put into motion, and a helpful summary of each of the nine main papers.

However, there are a couple of things that I find puzzling in this introduction *qua* introduction to a book entitled *Emergence in Mind*. One oddity is that it does not mention British emergentism save in a footnote but, instead, places the beginning of emergentistm solely in scientific disputes of the nineteenth and early twentieth centuries. Yet some reference sould have been made to the main texts of this tradition – J.S. Mill's *System of Logic* (1843), Samuel Alexander's *Space, Time and Deity* (1920), C. Lloyd Morgan's *Emergent Evolution* (1923) and C.D. Broad's *Mind and Its Place in Nature* (1925) – for it is in these that emergence becomes the core of a comprehensive philosophical position, arguably for the first time. Granted, British emergentism has been covered elsewhere in the literature (for example by McLaughlin (1992)). Still, this is a peculiar omission, given that this is a philosophy book on emergence about the mind and lacks the historical background in which emergentism first made its appearance in the philosophical tradition. Another thing is that the topics under the heading 'The Debates', are not issues distinctive of emergentism as such, but could have been included in the introduction to a book on non-reductive physicalism. These topics are 'Structured events and causation', 'The distinction between causation and explanation', 'Multiple realizability and non-reducibility', 'Property dualism and emergence' and 'The coherence of laws'. And though, of course, emergentism and non-

reductive physicalism are not unrelated, emergentism raises a number of issues that could have, more appropriately, been included. To name a few, the question of what constitutes levels, the distinction between weak and strong and synchronic and diachronic emergence, the question of whether supervenience is the right relation to characterize emergence, whether emergence is a naturalist position, questions about novelty, distinctness and reduction, and the empirical question whether it is a phenomenon that actually exists in the world. Though these issues are mentioned *en passant*, they are not taken up *per se* in the introduction or the essays in this collection as one might have expected.

These considerations, however, do not touch on the quality of the essays that are all of high quality from philosophers – some emergentists, some physicalists – working mainly on metaphysics and the philosophy of mind. These essays offer interesting and sometimes compelling views about emergence, or issues relating to it. This qualification is important because there are papers in the collection that do not tackle emergence directly but, rather, issues that relate to it. One such paper is Peter Menzies and Christian List's, which offers an explanation of the causal autonomy of mental properties based on an interventionist theory of causation and realization-insensitivity. They argue against the determination thesis that the causal powers of a mental state that is realized by a physical state are a subset of the causal powers of that physical state, and argue that if relevant causal claims remain true even when the way mental properties are physically instantiated changes, macrostate causal explanations are ineliminable. In their response Ausonio Marras and Juhani Yli-Vakkuri correctly point out that all Menzies and List's argument can establish is the explanatory autonomy of the special sciences not the causal autonomy of their subject matter. Though, of course, the question of the causal autonomy of the special sciences is intimately connected to the question of emergence, this paper, that doesn't mention emergence, could have been in a collection entitled 'Non-reductivism physicalism and Mind'. The same holds for David Papineau's paper, which raises the question of the plausibility of non-physical laws. Papineau argues that the only laws that we can have in the special sciences are those that focus on effects selected for independently of how they are realized, and that the non-reducible special categories featured in these cannot support multiply projectible patterns. Therefore they cannot be causally efficacious (though in some cases they can be explanatory). Michael Esfeld in his comments also does not mention emergence when he takes Papineau's argument a step further in the reductionist direction. Esfeld argues that we can

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conceptualise functional sub-kinds in the special sciences that are nomologically coextensive with physical kinds and so can be reduced to physics and be causally efficacious.

Nonetheless, this criticism does not touch the papers themselves or the interest these papers have in the broader debate about the mind/body problem, reduction and the special sciences. Obviously, a collection of papers from a conference cannot be expected to have the organic unity, or aim at the coverage, that a collection of papers specifically picked out for an anthology would have. Additionally, the theme of these papers is in tune with the view that some philosophers hold, that emergentism is a form of non-reductive physicalism.

This seems to be the position of the editors of this volume who propose an account of emergentism compatible with their physicalism and thus with causal closure. They base their view on a metaphysics of events and an account of property exemplification according to which events – which they identify with a subject at a time exemplifying a property – can co-instantiate in a single instance mental and physical properties thus allowing for mental properties to have causal effects. So, the Macdonalds argue, since property instances do not belong to different levels (though properties do) the problem of downward causation is resolved because, in effect, there is no downward causation in the sense assumed by arguments such as Kim's. Furthermore, causal efficacy for emergent and mental properties is preserved, they argue, since if a property has causally efficacious instances that means that the property itself has causal powers. I must admit that it escapes me how this is a strong emergentist position, since emergentism must involve a robust notion of downward causation, something which is eliminated by the Macdonalds' theory. This objection is raised in Peter Wyss's response. Wyss convincingly argues that this view is wanting from an emergentist point of view because it does not do justice to the double requirement of determination and distinction that emergentism requires.

But not everyone believes emergentism is a form of non-reductive physicalism and in the opening paper of this collection Tim Crane sets out to distinguish the two. Crane re-iterates his view – that has not been given the attention it deserves – that the distinction between explanatory and ontological reduction is essential for distinguishing emergentism from non-reductive physicalism. According to Crane, emergentism is clearly demarcated epistemologically rather than metaphysically, as the position that denies explanatory reduction and therefore is committed to an explanatory gap. In response, Di Francesco argues that there are more possible

responses to the problem of the explanatory gap than emergentism and non-reductivive physicalism alone. In particular, he proposes a distinction based on causal inheritance, between radical and moderate emergentism. The former denies causal inheritance, the latter accepts it, thus making it a form of emergence compatible with physical fundamentalism. The difficulty here is why we would want to call moderate emergentism any kind of emergentism at all? If moderate emergentism is committed to ontological causal monism then the causal powers in question are not really novel and distinct, as would surely be required in a strong emergentist position. And this would be in line with Crane's point, since if causal powers are inherited from the physical level where all the real work is done, even if they are not 'mechanistically reducible' there's no reason to suppose, at least as moderate emergence is construed by Di Francesco in this response, that they in principle defy some sort of explanatory reduction.

Looking at the titles in the table of contents and going through the essays it becomes clear that most of this collection is focused specifically on the metaphysics of causation in emergence. Thus, O'Connor and Churchill argue that Kim's arguments against the non-reductivist thesis are based on exclusion arguments that assume a metaphysics of causal powers; and that if we assume such a metaphysics, non-reductive physicalism is either incoherent or must accept overdetermination. They conclude that if we wish to retain the causal efficacy of the mental, given the possibility of multiple realization, only strong emergence is a viable option for an anti-reductionist. In response, Leuenberger questions the importance of exclusion arguments in defense of physicalism, non-reductive or otherwise, and argues that causal power metaphysics relies on a form of causal fundamentalism that is implausible.

On a similar theme, Paul Noordhof in 'Emergent Causation and Property Causation' aims to specify the conditions for emergent property causation. Noordhof distinguishes between emergent properties and broadly physical properties (properties that supervene on narrowly physical property causes and laws concerning them). The distinction is modal: emergent properties strongly supervene on narrowly physical properties merely nomologically, whereas broadly physical properties do so metaphysically. He then sketches a counterfactual theory of property instance causation, and argues that emergent causation does not necessarily involve emergent property causation. In his reply, Simone Gozzano offers the counterargument that if, in addition to properties, one includes laws about narrow causal properties in the supervenience base the very relation of

supervenience is threatened. And, since Noordhof builds his version of emergence around a specific form of supervenience, this makes his emergence either nonexistent in its strong form or merely epistemological.

In a very interesting paper that differs from the others in explicitly including evidence from science, Robin Findlay Hendry argues that emergence gives a more unified explanation of how physical and chemical properties interact than physicalism. Hendry turns to chemistry and argues that emergentism requires that explanations of chemical structure and bonding involve configurational Hamiltonians – something which is supported by Woolley and Sutcliffe's symmetry problem and which undermines support for the principle of the completeness of physics. In contrast, reductive physicalism has to posit a mechanism for symmetry breaking for which there is no independent evidence beyond the assumption of the completeness of physics. Hendry argues that empirical evidence for the completeness of physics is weak but that this evidence supports the weaker principle of the ubiquity of physics (that physical principles apply universally) which is compatible with emergentism and downward causation.

In the last two papers Achim Stephan and Philip Pettit take up the problems of free will and group agency respectively. Stephan looks through the emergentist lens at the problem of free will as found in the traditional views of libertarianism, hard determinism and compatibilism. He concludes that on the libertarian position, if free decisions exist they are strongly emergent. He also argues that for a hard determinist the phenomenal qualities of the feeling of making free decisions seem to be strongly emergent, while for the compatibilist the question of free will boils down to how neural processes are influenced by rational deliberation. This is one aspect of the problem of mental causation and, usually, resolved by an appeal to a reductive view. In his response, Max Kistler notes that there are two ways a property can be irreducible and thus emergent, either by not finding the property that fulfills the causal role of a systemic property or by not being able to discover the way (say, a mechanism) that properties of parts of a system and their interaction can bring about such a property as cited above. Kistler argues that neither of these is in principle impossible and offers a way in which a compatibilist could be a strong emergentist according to which mental states obey system (psychological) laws that constrain the evolution of the system thus determining systemic properties – strongly emergent mental properties - and properties of the system's parts. Again, it is not quite clear to me how this is more than a case of weak diachronic

emergence at most; and this is because Kistler's requirement that the state of one's body is determined by physical laws in virtue of the physical parts of the system at t_2 and psychological laws that apply to the person by virtue of the systemic properties of the system at t_1, does not make clear how strongly this determination is to be understood.

The volumes closes with Pettit's 'Rationality, Reasoning and Group Agency' in which he argues that, according to recent result in the theory of judgement aggregation, in order for group rationality to emerge a system-level feedback structure in the form of group reasoning is required. For this, a self-organizing system does not suffice, a self-governing system is necessary. This is a nice way to end the collection, with a topic in emergence that one does not often find addressed.

The quality and interest of the papers aside, this volume mirrors the literature on emergence in that there is dissent concerning what emergence actually is. It is noteworthy that very few of the contributors actually define emergence and those that do don't seem to agree. Yet, surely, this is something that has to be addressed and settled before one goes into the question of what is or is not emergent. Had a discussion of the British emergentists been included in this volume the contributors could have identified themselves relative to that tradition. That would have been helpful since, even though the British emergentists did not all agree in their accounts of emergence, they each had a pretty clear view about what it is for something to be emergent. Though to be fair, this might not be an easy task with a collection of papers from a conference, this omission could have been covered in the introduction. By focusing on non-reductive physicalism and causation, this collection misses the opportunity to address the central question of whether there is a viable alternative between dualism and reductivism and what that is exactly.

All in all, though this collection is largely focused on causation and, had it not been for the conference from which it originated, might have been better entitled 'Emergence and the metaphysics of causation' or 'Non-reductive physicalism, emergence and causation', its main contribution is that it touches on a wide range of issues all related to emergence, from causation, explanation and reduction to free will and group agency. A graduate student or researcher who wants a chance to familiarize himself with emergence in the philosophy of mind and explore its central topics may not find what he is looking for in this collection which does not contain discussions essential to someone who wants to get a feel of the issues central to emergence and, more specifically, to emergence in mind. This

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collection would be to a beginner what a party full of people who have known each other since childhood would be to someone who knows no one at it: suddenly immersed into a conversation with a long history that is not available to him. However, this volumes brings together diverse and provocative current views of eminent philosophers on topics that will be of interest to philosophers working on emergence. Philosophers working on causation and the metaphysics of mind can also dip into the book and focus on their question of interest without having to follow a line of thought or argument in the whole book, and in this respect the summary of the contributions to this volume found in the end of the introduction is very helpful. To them, I recommend this book.

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