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## **The Emergence of Mind in a Physical World**



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**Juan Diego Morales Otero**



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# Contents

|  |           |
|--|-----------|
| Acknowledgments .....  | 13        |
| Introduction .....   | 15        |
| <b>Chapter 1. Causation: A Non-Reductive Approach .....</b>  | <b>23</b> |
| The Nature of Causal Entities .....  | 26        |
| Causation and Laws of Nature .....   | 29        |
| Counterfactual Theory of Causation .....   | 35        |
| Causation and Locality .....   | 39        |
| Probability and Intervention .....   | 46        |
| Causal Context and the Possibility of Causation<br>in the Special Sciences .....                       | 48        |
| Summary .....  | 54        |
| <b>Chapter 2. The Concept of the Physical<br/>and the Overcoming of the Supervenience Theory .....</b> | <b>55</b> |
| What Physicalism Is .....  | 56        |
| Physicalism as a Contingent Theory .....   | 58        |
| What Is It To Be Physical? .....   | 60        |
| Microphysical Supervenience as the Criterion for the Physical .....                                    | 62        |
| The Empirical Failure of Microphysicalism .....  | 68        |
| Consequences for Determining the Concept of the Physical .....   | 72        |
| Finding a Solution to our Problem .....  | 75        |
| Summary .....  | 79        |
| <b>Chapter 3. Emergentism as Type Macrophysicalism .....</b>   | <b>81</b> |
| The Idea of Ontological Emergence .....  | 82        |
| Emergentism as Type Macrophysicalism .....   | 91        |
| Reductive and Non-Reductive Microphysicalism .....   | 93        |
| Property Dualism and Contingent Connections .....  | 101       |
| Emergence and Metaphysical Dependence .....  | 104       |
| Two Types of Ontological Emergence .....   | 112       |
| Summary .....  | 116       |

|  |            |
|--|------------|
| <b>Chapter 4. Non-Reductive Physicalism and the Problem of Causation in the Special Sciences</b> ..... | <b>119</b> |
| <b>Supervenience and Multiple Realizability</b> .....  | <b>120</b> |
| <b>The Causal Exclusion Argument</b> .....   | <b>125</b> |
| The Supervenience Argument .....   | 126        |
| The Principle of Physical Causal Closure .....   | 127        |
| The Exclusion Principle .....  | 131        |
| <b>The Interventionist Account of Exclusion</b> .....  | <b>133</b> |
| <b>The Argument of Causal Individuation of Natural Kinds</b> .....                                     | <b>140</b> |
| Higher Causal Powers as Identical to Lower Causal Powers .....   | 142        |
| The Subset Account of Realization .....  | 143        |
| <b>Summary</b> .....   | <b>153</b> |
| <br>   |            |
| <b>Chapter 5. Emergent, Downward, and Mental Causation</b> .....                                       | <b>155</b> |
| <b>The Idea of Emergent Causation</b> .....  | <b>156</b> |
| The Principle of Physical Causal Closure of Emergentism .....  | 163        |
| Emergent and Lower Level Causal Powers .....   | 166        |
| Testing the Causal Relevance of Higher Level Properties .....  | 170        |
| <b>Emergent Causation at the Quantum Level</b> .....   | <b>175</b> |
| <b>Mental Causation as Emergent Causation</b> .....  | <b>186</b> |
| <b>Summary</b> .....   | <b>196</b> |
| <br>   |            |
| <b>Appendix: Functional Reduction of the Special Properties</b> .....                                  | <b>199</b> |
| <b>Conclusion</b> .....  | <b>207</b> |
| <b>References</b> .....  | <b>209</b> |
| <b>Index</b> .....   | <b>229</b> |



*For Sri Kṛṣṇa, the Taitas of Putumayo, and my family,  
without whom this would not have been possible*



So my aim is only to establish conditional claims of the form: even if certain facts are emergent vis-à-vis the microphysical realm, Physicalism can still be true.

PAPINEAU 2008 132

Thus, for emergent evolution, conscious events at level C (mind) involve specific physiological events at level B (life), and these involve specific physico-chemical events at level A (matter). No C without B, and no B without A. No mind without life; and no life without «a physical basis.»

MORGAN 1923 15

I am not, for example, denying that there occur mental processes. Doing long division is a mental process and so is making a joke. But I am saying that the phrase «there occur mental processes» does not mean the same sort of thing as «there occur physical processes», and, therefore, that it makes no sense to conjoin or disjoin the two.

RYLE 2009 11-2

No one has contributed as much to our understanding of the problems of mental causation in recent years as Jaegwon Kim. We non-reductive materialists must face up to the serious difficulties he has raised for our position.

BLOCK 2003 133

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

FODOR 1990 156



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## Introduction

**ONE OF THE OLDEST** and most important philosophical problems is the question about human uniqueness. We know that Descartes introduced his dualist proposal with the aim of explaining it, and we also know that his position entails seemingly intractable problems. Since the beginning of Modernity, philosophers like Spinoza and Leibniz have noted that Descartes' proposal cannot be correct because mind and matter would constitute completely different substances, with such different attributes that they could not even be causally related to each other. It is precisely because of the existence of a *prima facie* metaphysical difference between minds and bodies that the question about their connection has occupied a central place throughout the history of Western thought, a crucial issue that has been called the mind-body problem.

Following the anti-Cartesian spirit, the physicalist proposal argues that our world, and therefore the human mind as one of its most important components, should be understood as fundamentally physical. It is now clear, as Gillett and Loewer (2001 ix) remind us, that the *Weltanschauung* of much contemporary philosophy is the doctrine of physicalism and, in consequence, as Kim comments,

«[a] strong physicalist outlook has shaped contemporary discussions of the mind-body problem» (2005 1).

One of my first and primary purposes in this book is to argue that, in the words of Papineau, «even if certain facts are emergent vis-à-vis the microphysical realm, Physicalism can still be true» (Papineau 2008 132). This means that emergentism, properly understood, should clearly be seen as a physicalist theory affirming that both mind and the phenomena of the special sciences (from chemistry and biology to psychology, sociology, and economics) are macrophysical entities that *metaphysically depend on but cannot be reduced to* the properties and relations of microphysics.

The idea of emergence was formulated in ancient times and has reappeared in human thought at different points in history. Perhaps we can find the greatest conceptual development of this perspective from the late 19th to the early 20th century in the work of the so-called classic British Emergentists, thinkers like John Stuart Mill, Henry Lewes, Samuel Alexander, C. Lloyd Morgan, and C. D. Broad. It is essential to understand and keep in mind that the concept of emergence is introduced in order to overcome both dualism and microphysicalist reductionism. On the one hand, the dualist perspective asserts that there are two classes of individuals or substances, corporeal and immaterial, which are completely and ontologically independent, but that they can be causally and contingently related. On the other hand, microphysicalist reductionism (called ‘mechanism’ by British Emergentists) argues that all complex phenomena which in principle seem to be located outside or beyond the physical realm, such as biological, mental, and social phenomena, are actually metaphysically determined by, and in fact are «nothing over and above,» basic physical phenomena, i.e., microphysical entities.

Emergentism seeks to overcome these positions in a subtle and somehow synthetic way. Against the dualist, the emergentist argues that the world previously conceived as bifurcated, as divided into two separate ontological realms, must be understood as a unitary world wherein we only find entities belonging to a fundamental ontological category, that of *material beings*. And, against the reductionist, the emergentist claims that the material world is not a simple, linear, and flat domain, whose constituents are located in a single hierarchical



and ontological level; rather, it is a world consisting of a series of layers that complexly organize its purely material elements. The basic idea of emergentism is that there are *macrophysical systems* with distinctive characteristics and dynamics arising from the properties, relations, and interactions of *purely physical components* which, however, cannot be reduced to, explained in terms of, or identified with the latter. According to this view, paradigmatic examples of emergent physical systems are biological and mental.

If my goal is to show that emergentism should be articulated as a completely physicalist theory, we can understand the bulk of the monograph as a direct response to Jaegwon Kim's reiterated criticisms of any non-reductive physicalist theory, according to which the latter's understanding of the causal responsibility of the higher level properties is finally inconsistent and, therefore, must adopt either causal reductionism or epiphenomenalism. To put it in other words, we can say that much of this book can be seen as a direct response to the challenge that Kim imposes on non-reductive physicalism to

come face to face with the problem of downward causation. [...to]

devise an intelligible and consistent account of how emergent [that is, higher level and non-reducible] properties can have distinctive causal powers of their own—in particular, powers to influence events and processes at the basal level. (Kim 2006a 559)

To that effect, the monograph is structured as follows.

Chapter 1 is devoted to examining different philosophical approaches that have tried to define the concept of *causation* in terms of nomological regularities, counterfactual dependence, and transference of a physical quantity. I stress the importance of not reducing this concept to any one of these factors and claim that a fundamental characteristic of causation is what I call *the internal context* of the cause, namely, the internal properties or conditions that an event as a cause must have to be nomologically sufficient for its effect. I give reasons to affirm that the possibility of real causation in the special sciences can be explained from the existence and interaction of these internal conditions.

In chapter 2, I focus on the analysis of the concept of *the physical*. Through the examination of the contemporary characterization of the physicalist theory, I attempt to make explicit the necessary conditions to be fulfilled by any object, event, or entity that should be counted and addressed as physical. I develop a detailed argument to show why the most accepted formulation of physicalism, the theory of the metaphysical supervenience or complete determination of empirical phenomena by the *microphysical* characteristics, is insufficient both empirically and conceptually. On the one hand, it contradicts results from physical science; and, on the other hand, it contradicts both the scientific and the daily use of the notion of the physical. I argue that the philosophical tradition—at least since Descartes— can provide the criteria for understanding the meaning we give to this notion, so that physicalism should be understood as affirming that all the entities of our world are essentially objective, necessarily spatiotemporal, and, in principle, explainable according to the mathematical methodology of the natural sciences. In this sense, we can say that physicalism posits a world some of whose fundamental phenomena *can* be essentially *macrophysical*, i.e., *physical* phenomena which cannot be reduced to, nor understood purely in terms of the properties and relations of their microphysical components.

The purpose of chapter 3 is to develop a careful articulation of the concept of *ontological emergence*. In the first section, I develop a general characterization of ontological emergence whereby this phenomenon should be understood as *a special organization or relational structure* that the constituents of a system can acquire, and which introduces a causal and dynamical difference that is not completely determined by the causal factors of these constituents. The second section is devoted to the examination of the relation between the emergentist thesis and the ontological approaches of reductive physicalism, non-reductive physicalism, token physicalism, and property dualism, showing that, despite the numerous readings suggested in recent years, emergentism should be treated as a clear case of non-reductive physicalism. Finally, in the third section, I distinguish two general types of ontologically emergent entities, which will allow us to comprehend the internal

diversity of the phenomenon and to refine the boundaries of the concept in order to understand its philosophical and scientific consequences.

In chapter 4, I carry out an analysis of the problem that non-reductive physicalism in its functionalist account (NRP), the most important philosophical naturalistic position in recent decades, has to face when defending its claim about the *reality and irreducibility* of the causal power (influence, responsibility) of mental properties and those of the special sciences. This position affirms that mental and higher level properties are legitimate constituents of a fundamentally physical world because they *metaphysically supervene* on and are realized by basic or microscopic physical properties. In addition to its physicalist commitment, this perspective argues that higher level or special properties cannot be reduced to lower level physical properties, just because they are multiply realizable by them.

Some philosophers, especially Jaegwon Kim, have leveled very important critiques at this non-reductive physicalist (NRPist) proposal. Kim develops the well-known causal exclusion argument which purports to prove that for the physicalist there are only two options with respect to the status of special properties: either reductionism or epiphenomenalism. The interventionist approach to causation responds that the exclusion argument turns out to be incorrect when we consider it according to its empirical implications. Although I agree with the interventionist approach that the exclusion argument is not conclusive, I believe there is another important argument set forth by Kim to show that NRP cannot account for the reality of the causal status of higher level properties: what I call the argument of causal individuation of natural kinds, which affirms that on the NRPist proposal, higher level properties cannot maintain a necessary unity through their different physical realizations and, for this reason, cannot be considered as real natural properties or kinds.

These criticisms support the functional reductive approach (see Appendix) which argues that to avoid eliminativism about higher level properties, we must reduce them 'locally' to each of their physical realizers. This strategy takes the predicates of the special sciences as expressions which contingently refer to different physical properties

that perform the causal role that these expressions define. But the paradoxical consequence is that, on this view, special properties should be finally eliminated. This follows because the categories of the special sciences *are not truly referring to real special properties* but only to sets of multiple and dissimilar basic physical properties in a somehow contingent and indirect way.

The overall conclusion is that neither NRP nor the functional reductive proposal seems to have a satisfactory account of mental and special properties. On the one hand, NRP cannot vindicate the reality of special causal powers because it cannot explain the necessary unity they must maintain through their different physical realizers. On the other hand, although more metaphysically robust, the functional reductive proposal affirms that insofar as the special properties arise from different physical conditions, they finally cannot be real, a consequence that I think is very difficult to swallow. Since this is an empirical claim, what I find most problematic about the functional reductive proposal is that it seems to assume that, *in a physical world*, the reduction of the higher level properties and the denial of their MR is a conceptual or metaphysical fact. *But surely a physical world with MR higher level properties is an empirical possibility*, not a metaphysically excluded possibility!

And this entire complicated picture arises from the single idea of the metaphysical supervenience of the macro-properties on their microphysical realizers or conditions. This is an empirical question and it could be that the microphysicalist thesis is correct. If this were the case, we should say that the functional reductive proposal is the more plausible approach for understanding our empirical world. But I have said that microphysicalism is a contingent thesis with deep conceptual and empirical deficiencies. On the one hand, it does not allow us to fix or to understand the use we make of the notion of the physical, and, therefore, of the notion of the physicalist theory; this only means that there are alternative ways for understanding and formulating physicalism which are not based on the microphysical supervenience theory. And, on the other hand, it seems to be incompatible with results coming both from physical science itself, as when we talk about holistic or systemic

physical properties not reducible to their constituent conditions, and from the special sciences' greatly successful theories and experiments that provide explanations and predictions which, as far as we know, are not reducible to the microphysical laws and explanations from which they must arise. I think emergentism can do better.

Finally, in chapter 5, I focus on a careful articulation of the concept of *emergent causation* and its application to the phenomenon of *mental causation*. While the notion of emergent causation is the idea that some irreducible macrophysical properties (properties only instantiated in composed physical systems) are causally relevant for the subsequent instantiation of both other macro or higher level properties and microphysical properties, the concept of mental causation refers to the causal relevance or responsibility that mental or psychological properties, such as being in pain, believing that snow is white, and desiring ice cream, have on the subsequent instantiation of other properties, whether psychological, social, biological, or properties of any other organizational level.

The prominent concepts of downward causation, lower level causal under-determination, and higher level causal constraint and selection are clarified and interconnected in this final chapter. Although some theorists interested in the nature of dynamical systems and the appearance of emergent properties in a physical world have suggested some possible avenues for understanding the *downward causal* interaction entailed by the occurrence of any higher level and non-reducible (i.e., emergent) causal process, there has not been any effort to systematically articulate its basic structure. I develop this articulation through the elucidation of three examples: in the first place, I analyze and reconstruct in detail an abstract example that helps us understand the general mechanism and structure of downward causation which is based on the constrictive and selective action of the higher level laws on the underdetermined possibilities of the lower levels. This articulation serves to clarify the kind of non-reductive principle of physical causal closure that emergentism should maintain, the necessary relationship between the emergent and the lower level causal powers that is implicit in every case of emergence,

and the very special and complex method to empirically test the causal relevance of the higher level properties.

Secondly, I carry out a conceptual examination of the causal structure of one the most recurrent examples that different theorists have used to analyze the apparent failure of the microphysical supervenience theory, that is, the phenomenon of the quantum states of entanglement. I argue that if our current scientific understanding of the quantum world is correct, then we have a primary empirical example that allows us both to claim the failure of microphysicalism, the most predominant philosophical-scientific theory of recent decades, and, what is more important for our conceptual understanding of the relationship between the different levels of organization of our physical world, to clarify and articulate in a very concrete way the nature and structure of the phenomenon of emergent and downward causation.

Thirdly, I examine the neurobiological basis of pain and its connection with the appearance of different levels of personal and experiential psychological phenomena. I describe the two different neurological nociceptive (relative to pain) subsystems, namely, the discriminative and the affective nociceptive neural structures, from which two different and corresponding nociceptive experiences arise: the discriminative and affective nociceptive experiences. I examine the different levels of composition and organization that are implicated here to focus on the conceptual articulation of the causal dynamics that should structure the interaction between the two experiential levels involved in this phenomenon, that is, the level of discriminative and affective nociceptive experiences and the level of our normal and unitary experience of pain. On the basis of this type of examples, the emergentist theory then argues not only that the mind can emerge from atoms, molecules, cells, and neural informational processing, but that the very mental states can become organized in a hierarchical, emergent, and irreducible way.

Finally, it is possible to say that the arguments developed throughout this monograph show that macrophysicalism or emergentism is not only a coherent and well suited conceptual proposal about the causal functioning of the different levels of composition and organization of our physical world, but that, as far as we know, it can be its most plausible empirical articulation.