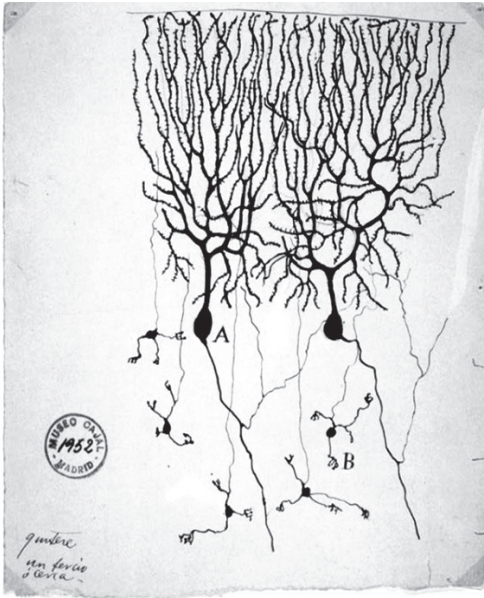


THE BUTTERFLIES OF THE SOUL



Células de Purkinje, por Santiago Ramón y Cajal
(Archivo Ramón y Cajal, Madrid)

The issues raised by the mind-brain problem are far from simple. Frequently they give rise to theoretical and practical questions that are deeply rooted in the history of thought. Pointing out the Greek etymology of the word «soul» (ψυχή), the Spanish neuroscientist and Nobel laureate Santiago Ramón y Cajal alluded to those difficulties in his reference to the butterflies of the soul:

Like the entomologist in pursuit of brightly coloured butterflies, my attention hunted, in the flower garden of the gray matter, cells with delicate and elegant forms, the mysterious butterflies of the soul, the beating of whose wings may some day—who knows?—clarify the secret of mental life¹.

The dialogue between neuroscience and philosophy is just an attempt to unravel the mysterious issues that are implicit in the mind-brain problem, although even if that could be done exhaustively, that possibility should be left to one side and examined elsewhere.

The term «neurophilosophy» refers to the contemporary confluence of different disciplines. Within this theoretical frame, the studies of experimental psychology and neurophysiology converge with the approaches of neuroscience and the technical developments that have spawned them. The theoretical point of view is complemented by the practical perspective, related to medical applications (psychiatric, surgical, pharmacological) as well as to the opening of horizons such as artificial intelligence. This confluence has unfolded on

¹ RAMÓN Y CAJAL, SANTIAGO: *Recollections of My Life* (1989, page 363), The MIT Press, Cambridge, MA. Translated by E. Horne Craigie with the assistance of Juan Cano.

the basis of assumptions typical of evolutionary biology after Darwin and of neurophysiology after Ramón y Cajal. All this has led to a rethinking, on new bases, of one of the most substantial and ancient philosophical issues: the soul-body question, now translated as the mind-brain problem.

In recent decades, neurophilosophy has moved in from the margins of philosophical studies, and increasingly attracts the attention of specialised researchers. There are now multiple approaches focusing on neuroscientific data from perspectives related to theoretical and practical philosophy (neuroepistemology, neuropolitics, neuroeconomics, neuromarketing and neuroaesthetics, to name a few). Neurophilosophy is thus at the forefront of the intellectual interests of our time. This phenomenon can be interpreted in at least two ways.

One of these interpretations understands neurophilosophy as a second-level reflexion spurred by the fascination with advances in the field of neuroscience. This attraction has been stimulated by both the striking development of non-invasive techniques for observing brain activity, and the apparent simplicity and efficacy of the types of intervention that neuroscience has opened up in the spectrum of psychic dysfunction. All of this has taken place against the background of considerable public and private investment that has propelled the neuroscientific approach to the psyche to the forefront of natural-scientific research.

The rise of the theoretical and practical perspectives associated with this spearhead reflects this admiration and impulse. The conceptual umbrella of neurophilosophy provides a space for trends with varied approaches and heterogeneous ideological natures. It is frequently an epiphenomenon with ephemeral sociological features, like those of a fashion, not alien to the dynamics of production and communication typical of the neo-capitalist economy.

The alternative interpretation recognises in neurophilosophy the legacy of a rich tradition in the history of ideas. The philosophical treatment of the soul-body problem and the research on the mind-brain problem are found in this tradition, as two links associated with different but interrelated hermeneutical frameworks. The theoretical and practical perspectives to which we have alluded give rise to the foundational questions. Approaching them honestly requires an in-depth approach to far-reaching methodological and epistemological assumptions and would significantly sharpen their anthropological, metaphysical, and ethical backgrounds.

Accordingly, it does not attend to new themes, brought to light by ephemeral sociocultural conjunctures, but to secular questions modulated at the height of the times. The way in which neurophilosophy emerges, demanding interdisciplinary work—ranging from quantum physics, evolutionary biology and neurophysiology to sociology, pedagogy and ethics—is a good example of its theoretical nature, coherently inserted in the plural methodological horizon of twenty-first century research.

The contributions to this monograph are based on the second assumption. Their authors take into account a wide range of problems that are inherent to

the neurophilosophical field, recognising in them a theoretical and practical relevance that goes beyond a mere trend, while at the same time, tackling the most recent debates and research around new thematic issues.

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These are reflections on the practical challenges that neurophilosophy raises. The first three papers address one of the semantic and theoretical fields most commonly associated with neurophilosophy: that of philosophical naturalism. This happens from complementary but not coincident points of view.

Jesús Conill Sancho («Can the human person be naturalised?») points out the conceptual weaknesses of naturalism when it comes to giving reasons for human specificity. He moves on to a Zubirian metaphysical frame to overcome neuroscientific naturalisation and to reach a non-naturalistic notion of person. In this vein, Javier Gracia Calandín proposes a theoretical frame («Critical neurohermeneutics») as a non-reductionistic approach to neurophilosophy. Against the theoretical and practical weaknesses of naturalism, critical neurohermeneutics is presented as a necessary foundation of non-reductionistic neuroethics. The author of this preface moves on from the conceptual mapping of naturalist typologies to show a naturalistic approach to the human being («Critical naturalism») that eludes the ontological reductionism—typical of radical ontological naturalism— thanks to its connection with the emergentist perspective.

The next four papers identify different aspects of practical rationality that are intrinsically linked to neurophilosophical issues.

Lydia de Tienda Palop («The formal structure of practical rationality») approaches the conceptual framework by clarifying the elements that formally constitute rationality as a moral, normative demarcation-giving activity. Beyond its intellectual side, particular emphasis is given to its emotional dimension. In turn, Elsa González-Esteban and Patrici Calvo Cabezas («Homo reciprocans from the neuroscientific literature. Criticism from neuroethics») address reciprocity, a concept widely used in the neuroscientific literature on practical issues. Their approach, with a strong emphasis on the domain of neuroeconomics, examines the normative frame of neuroethics from the perspective of mutual recognition, leading to Cortina's ethics of cordial reason. José Ignacio Murillo («Virtue, habit and neuroscience») considers the neuroscientific concept of habituation in the light of the classical philosophical framework, in order to show the fruitfulness of the latter for a view of human beings in which the dispositions are linked to the ends that give them sense and meaning. From a methodological point of view, Pedro Jesús Pérez Zafrilla («The dual process model of moral judgement. A divided mind or a myopic methodology?») analyses the dual model of moral judgement moving on from the approaches of Greene and Haidt. Beyond their two critical revisions, his approach provides a wider perspective on the use of dilemmas in moral debate.

The three papers in the third section of the monograph look at the educational aspects of the practical challenges of neurophilosophy.

From the point of view of neurophenomenology, Francisco Arenas-Dolz («Cognition as a process in dynamic systems: neurophenomenology, learning and education») reveals the educational relevance of the neurophilosophical approach. His paper addresses both the conceptual framework of neurophenomenology and its learning-oriented implications. Promoting inclusive learning environments occupies a relevant place among these implications; Sonia Reverter-Bañón («Together or separate? Contributions from neuroeducation to the debate on sex segregation in schools») introduces neurophilosophical reflexion, guided by moral deliberation, as a useful tool to promote the specific aims of education. She critically examines the debate on separating children by sex in schools as an example of interdisciplinary dialogue. Javier Gracia Calandín («Eradicating xenophobia and aporophobia: compassion as a key capacity of moral neuroeducation») criticises the notion of human being that emerges from a mere evolutionary view and seeks in compassion, both from philosophical and neuroscientific approaches, the condition for a non-tribalist paradigm. His book *El desafío ético de la educación* (2020) is reviewed by Marina García-Granero. As a complement to the present list of papers about neurophilosophy and its current challenges, the article by Antonio Jácomo and Carlos Sanmartín that provides an integrative view of Damásio and Zubiri's approach to the link of brain and consciousness.

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Contributing to elucidate these challenges, providing arguments to further our understanding of them and to approach them, and helping to continue thinking about these questions: these are the goals of the authors who contributed to this monograph. Within these pages, we have attempted to approach some of the most difficult theoretical problems: those related to the butterflies of the soul.

Valencia, 1st May 2021
169th anniversary of the birth of Santiago Ramón y Cajal

Pedro Jesús TERUEL
Editor of this issue