Editorial

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For an interdisciplinary journal such as *Mind and Matter* it is a permanent challenge to propose, report, or even establish sound and viable ideas at the (mutual) frontiers of different disciplines. However, we all know that interdisciplinary projects can occur in a variety of forms. The contributing areas can be close or remote, few or many, small or huge. Correspondingly, interdisciplinary projects can involve different degrees of difficulty, and together with that different time scales, in order to be accomplished successfully.

Arguably the easiest, and in this sense weakest, form of interdisciplinary work is what one may call interdisciplinarity by addition, where the idea is to address and contextualize a topic by different disciplinary perspectives. Each perspective contributes what it can more or less independently from the others, so that each one can be developed and ultimately understood without any deep understanding of the others. The range of disciplines can be wide, and it can be worthwhile to put all corresponding perspectives together in a compact way. But eventually this amounts to something better denoted as multidisciplinarity.

At the other end of the spectrum there is a subtler and more demanding form of interdisciplinary work, typically referring to riddles which cannot even be reasonably addressed (not to speak of resolved) by additive approaches. Making real progress toward a resolution of such riddles requires, not only permits contributions from different disciplines: no progress will be achievable by a simplistic composition of inputs. Only their integration in a truly interlaced fashion may lead to novel insights beyond the level of the individual input areas.

A simple historical example may give us some clues in this respect. In the mid 19th century, electric and magnetic phenomena, discovered independently to begin with, were understood within one superordinate framework, culminating in Maxwell’s equations of electrodynamics. Before this overarching theory of electromagnetic fields was found, magnetic phenomena in the presence of moving electric charges as well as electric phenomena in the presence of magnetic poles were profound anomalies.

In my view, the mind-matter problem today confronts us with a situation that is structurally similar – although the contributing disciplines evidently cover a much wider range than electricity and magnetism. We have extremely well developed and established theories about the material world, and we have elaborate ideas and models about the mental. But we
encounter unexplained phenomena – anomalies – when minds band together with brains and bodies or with the external world. Some of these anomalies occur robustly and regularly, such as relations between mind and brain, some of them are reported as occasional and evasive.

Will we be able to clarify such anomalies by better developed or refined theories of the mental and the material separately? My suspicion is that the answer is negative. Genuinely psychophysical phenomena are neither physical phenomena within some psychological context, nor are they psychological phenomena under some physical boundary conditions. I think it is a plausible hypothesis to try and understand them as something beyond the material and the mental, as electromagnetic forces are beyond electric and magnetic forces.

In this sense, interdisciplinary approaches are needed that do not just concur additively, but are of a truly integrative kind. Such interdisciplinarity is not merely an option but a must, forced by the goal to understand a topic. And, along the way, chances are good that this will appreciably impact the seriously involved scientist. Because individual disciplines must literally be transcended, it is appropriate to refer to this form of interdisciplinarity as transdisciplinarity.

Now, to keep expectations realistic, no one among the contributions to this issue resolves the mind-matter problem. But they all contain sparks of ideas, frameworks of thinking, or visions of how stepwise progress might be achievable. They all offer genuinely transdisciplinary food for thought. It is a distinctive feature of their transdisciplinarity that it is not bounded either within the sciences or within the humanities. It connects them, thus seeking the most challenging kind of transdisciplinary occupation we can think of in academia.

We begin this issue with Robert Spekkens’ obituary for the mathematician Ernst Specker, who recently passed away in his hometown Zurich at the age of 91. Much of his mathematical work has been on Quine’s simplified foundations of axiomatic set theory. What made him well-known beyond the mathematics community, however, is his collaboration with Simon Kochen on the logic of quantum mechanics, based on partial Boolean algebras: the Kochen-Specker theorem of 1967.

As it happened, Robert Spekkens recently published a remarkable article with Liang and Wiseman (Physics Reports 506, 1–39) about a precursor paper of 1960 by Specker alone and its rich ramifications. This paper, later translated as “The logic of non-simultaneously decidable propositions”, is written in typically Speckerian style – its core is formulated in simple words, in a parable even, and when the mathematical machinery gets launched, even much of this is done in descriptive terms.

The logic of propositions was also a main theme in the work of Carl Friedrich von Weizsäcker. For him, logic was essentially the tool for relating physics to philosophy, and the logic of complementarity the key
to understanding quantum physics. From a philosophical point of view, Weizsäcker’s program has its conceptual nucleus in Kant’s dictum in the *Critique of Pure Reason* that the conditions for the possibility of experience are at the same time the conditions for the objects of experience.

Gernot Böhme writes about his reminiscences of a conversation with the late von Weizsäcker about exactly this program – an attempt to lay the foundations of physics in philosophical metaphysics. He points out how von Weizsäcker tried to link the basic issue of experience with a logic of temporal propositions, quantum measurement, and a role for the (human) subject in physics in general. Was this program successful? It had its successes, says Böhme and discusses a particularly impressive one in detail, but in conclusion he argues that its basic assumption of a rigorous unification of all sciences will be unfeasible.

Yet another point of contact between physics and philosophy is addressed by David Finkelstein. It refers back to an article by Wheeler entitled “Law Without Law” of the early 1980s, which asked whether physical laws actually do not appear in a truly fundamental fashion. In his contribution, David Finkelstein underlines the importance of this question. He refers to C.S. Peirce’s tychism (tyche is the Greek goddess of chance) – the visionary idea that laws form gradually out of total disorder by a process that Peirce called “habit-taking”, and for which Finkelstein coins the notion of “logogenesis”.

Such habit-taking can be illustrated if one assumes that chance configurations of entities always exhibit chance correlations and anti-correlations. Peirce proposed that these correlations and anti-correlations do not cancel away over time but have a tendency to become more and more “entrenched” until they establish lawlike behavior. Also of special interest in Finkelstein’s article is his criticism of the idea of wave function “collapse” and his memories concerning the roles of Wigner and von Neumann for the “orthodox interpretation” of quantum theory.

The contribution of Michael Kurak leads us back to Kant, this time not through the *Critique of Pure Reason* but mainly through the *Critique of Practical Reason*. The author contrasts Kant’s and Hume’s positions on moral judgment and finds a key difference in the role played by moral emotions: For Hume, moral emotions are the cause of moral judgment, while for Kant they are their effect. On Kant’s account the cause of morality, the only way to secure its possibility, is given by practical reason, e.g. duty, the power of our will to act against our inclinations.

In order to secure a valid cause for morality, Kurak goes on to compare Kant’s position with current investigations in psychology and brain science. He argues that, different from a number of current views, the framework established by Walter Freeman (a member of our editorial board) instantiates Kant’s position best. The basic idea of self-organizing and self-determining behavior of the mind-brain may be the ground for
a categorical imperative expressing that a moral *individual’s will* should lead to actions appearing as if they were determined by a *universal law*.

Walter Freeman’s own contribution together with Takao Asano, a Japanese neurosurgeon, is based on a foreword to an upcoming Japanese translation of Freeman’s *How Brains Make Up Their Minds* of 2000. The text relates perfectly well to Kurak’s paper, providing many details explicating his points, though in relation to philosophical systems different from Kant’s. In this regard, readers may consult an earlier issue (6/2 of 2008) of *Mind and Matter* explaining Freeman’s affinity to Thomas Aquinas in general and his notion of intention in particular.

The joint article by Freeman and Asano in the present issue expands the framework from the biodynamics of self and consciousness to questions of choice and freedom. This latter area is evidently significant for the issue of moral judgment. Although Kant’s categorical imperative is nowhere mentioned in their article, the idea of individual freedom as the recognition of necessity pervades the discussion so much that it will be unquestionably obvious to the reader.

Johannes Wagemann’s article outlines an ambitious project to understand mind-brain relations based on a phenomenological analysis of features exhibited within the two domains. Wagemann’s approach is based on an epistemology worked out by Herbert Witzenmann whose major opus of 1983 has the title *Strukturphänomenologie*, translated as “structure-phenomenology”. Witzenmann’s thinking is to be understood within the tradition of Goethe and Steiner, and relates them to particular contemporary philosophical ideas.

A particularly interesting aspect of Wagemann’s work is that he relates the different historical positions concerning the mind-matter problem (materialism, monism, idealism, realism) to a typology of structures of conscious activity itself: physiological-material, mental-phenomenal, psychosomatic, somatopsychic. This allows him to propose a meta-philosophical integration of the different positions, which is characterized by a strong processual flavor, dissolving both monistic and dualistic fixations.

In other frameworks of thinking, a crucial element in such approaches has been occasionally referred to as a *coincidentia oppositorum*, a coincidence of opposites, expressing the paradox of perceiving and conceiving the one and the many, unity and diversity, simultaneously. An interview with Jeffrey Kripal, editorial board member of *Mind and Matter* since 2008, circulates around this same theme. Kripal holds a chair in religious studies, but his horizon covers many other areas of human experience and scholarship.

With respect to psychophysical phenomena, he pushes the postmodern-sounding idea that they should, in some way, be regarded as narratives, stories, metaphors, or symbols that transfer and reveal meaning. And this meaning is the glue holding mind and matter together. The idea
reminds us of Jung’s concept of synchronicity, and it reminds us of mind and matter as dual aspects based upon a psychophysically neutral “ultimate reality”. Is this deeper reality itself a “text”? I doubt it, he says, but texts are the way that human beings are capable of engaging it.