



Are Brean (born 1965), MD, PhD, Editor-in-Chief of the Journal of the Norwegian Medical Association. He is a specialist in neurology.

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The distinction between «mental» and «physical» is an impediment to an integrated understanding of the human. We are not a mind and a body, but both, inseparably and at the same time

It's only mental

I decide to raise my arm. It moves. So simple. Yet, this embodies the entire enigma: how can an apparently immaterial will manifest itself in a material act? To most of us, material reality intuitively appears to be essentially different from its mental counterpart, which is accessible only through our own subjective consciousness. Such notions of essential difference contrast with the example of the arm, which clearly testifies to a continuous and seamless interaction between these two worlds (1), that in our daily existence cannot be separated from each other.

In our culture, René Descartes (1596–1650) tends to be «blamed» for dualism. However, whether he was such a dualist as we like to think is still a matter of debate (2). Thinkers and practitioners both before and after his time have been sceptical of dualist notions of the human being. Aristotle (384–322 BCE) rejected the distinction between body and soul (3). Jean Martin Charcot (1825–1893), the founder of neurology, was convinced that the cause of hysteria, the very emblem of a «mental» disorder, lay in the brain (4). Even Sigmund Freud (1856–1939) insisted on referring to psychoanalysis as a «biological psychology» (4).

Posterity has proven all of them right. Neurobiologically speaking, we have all the more reason to close the artificial gap between the body and its dweller. The two are one and the same. One example is provided by our emotions, which according to modern neurobiological understanding are seen as representations of physiological states of our body, and as having originated to facilitate individual learning regarding which bodily conditions ought to be sought for or avoided (5). The neurobiological substratum of our emotions is mainly found in the phylogenetically oldest parts of the brain. It has therefore been postulated that emotions as a neurobiological phenomenon formed the basis for development of higher levels of cognition and consciousness (5). Thus, insight into the neurobiology of the emotions is gradually providing us with a biological understanding of the apparently immaterial processes in our brain. If we reflect on this, it tallies well with our daily experience, because emotions are bodily in nature. We blush with shame, our heart races with excitement, fear makes us breathless and we shed tears of despair.

The integrated understanding of the human brain also provides insight into the importance of the external environment to our health, as well as of how both «mental» and «physical» experiences in the broadest sense change the properties of individuals at the molecular level. Epigenetic modifications are caused by environmental influence and change the genetic expression (6). Overwhel-

ming amounts of neurobiological research have shown how learning changes the human brain both physiologically and anatomically. All experiences leave biological traces, irrespective of their «mental» or «physical» nature. Other discoveries, such as the brain's mirror neuron systems, have paved the way for a new understanding of the neurophysiological processes that underlie social interaction. Physiological as well as anatomical changes are detectable in the brain after psychotherapeutic interventions, and these are similar to those caused by drug-based therapies for equivalent disorders (7). Research on the effects of such widely different forms of therapy as deep brain stimulation, cognitive behavioural therapy and neurofeedback has shown how surgical, medical and psychological treatment produces measurable neuroanatomical and neurophysiological changes in the brain resulting from «mental» disorders (8).

Dualism nevertheless persists, primarily in the popular imagination, as seen in the debate on chronic fatigue syndrome/myalgic encephalopathy (9), but perhaps more surprisingly it also permeates textbooks on neuroscience (10). Amazingly often, the dualist notion of illness is linked to ideas of a hierarchy, in which diseases perceived as «physical» seem to enjoy a higher prestige than diseases that are seen as «mental».

Most likely, the brain's complexity imposes limitations on our understanding of it. If the laws of physics apply to all aspects of the brain, it can in theory be mapped out completely. However, some of the brain's self-referential properties may set the boundaries for such a mapping (11). For example, it can be claimed that postulating such a phenomenon as «free will» presupposes that a complete biophysical explanatory model of the brain cannot be achieved. Because, in a fully mapped biophysical system, the response to any stimulus could in theory be precisely estimated, thus excluding such a thing as «free will» (11). Simply put: If the brain were so simple we could understand it, we would be so simple we couldn't (12).

The human brain is the most complex structure known to us. This ought to imbue us with the humility to admit that we will never understand it fully. However, this should also make us sufficiently humble to see that our intuitive understanding of it could be treacherously wrong. The intuitive belief in the distinction between a mental and a physical self is a hindrance to an integrated understanding of ourselves as whole humans. Humans are not a mind and a body, but both, inseparably and at the same time. Nothing is «only mental».

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