The Mind-Body Problem – is it Really a Problem?

by Hans-Georg Stork
(h-gATcikon.de)

"Body am I, and soul"- so saith the child. And why should one not speak like children? But the awakened one, the knowing one, saith: "Body am I entirely, and nothing more; and soul is only the name of something in the body."
"The body is a big sagacity, a plurality with one sense, a war and a peace, a flock and a shepherd. An instrument of thy body is also thy little sagacity, my brother, which thou callest 'spirit' - a little instrument and plaything of thy big sagacity"

Friedrich Nietzsche, Thus Spake Zarathustra

What is the problem supposed to be and what would qualify as a solution? To begin with let us speculate on how this alleged problem came about in the first place. Presumably it came about because some people noted an undeniable big difference between a rock and themselves. They also noted differences between themselves and what they perceived as other forms of life: of plants and all animals other than humans.

These differences mainly become manifest in what humans can do that rocks, plants and non-human animals cannot do. Humans can talk, they can set up vast intra-species communication networks, and – above all - they can create symbolic worlds that empower them to transform their environments and define the relations among themselves in unprecedented ways.

In addition, humans have, by their own accounts (that can be – within limits – symbolically communicated via spoken and/or body language), rich *inner experiences* (as opposed to experiences directly triggered by external sensory input) leading them to believe in being indivisible, unique "*selfs*" (yet another *inner experience*) and normally to count on fellow humans to be capable of the same or similar experiences. (But they do not normally count on non-human biological entities to be capable of the same or similar experiences.)

So they conclude that there is indeed something special about them, that they have been endowed with faculties no other material / physical entity has been endowed with. They believe these faculties are brought about by something they call "*mind*" and many are convinced that there must be a categorical difference between the *mental* and the *physical*.

One may assume that in our post-Darwinian era we do not need either ghosts or a *deus ex machina* (or *ex whatever else*) to explain the presence of this something in (or outside?) our bodies and somehow controlling the way our bodies behave. Indeed, apart from (a not so few) diehards, within scientific communities it now appears to be generally received wisdom not to postulate an external being that somehow imbues our

bodies with some sort of mysterious spirit. And not to invent fairy-tale stories dressed up in lofty philosophical terms that do not explain (by any standard) anything, but at best obscure what ought to be explained (dualism, monism, physicalism, materialism, eliminativism, etc., etc.).

So what is the problem? Is it: what leads to the development within an *embodied material / physical system*, of the above mentioned faculties? Or, in slightly more elaborate parlance: what makes a material system develop internal structures and mappings of its environment into these structures, so that the ensuing internal dynamics make it exhibit said *mental faculties*?

If these questions constitute the problem (and what else could it be?[1]) then we know the answer: within certain systems these faculties (and possibly many more) are simply among the current outcomes of an evolutionary process that has been going on on planet Earth for billions of years. As is well known, Nature, with her "*mental equipment*" (Mathematics, Physics?), has indeed found a solution, using her *material resources* (Chemistry?): We are this solution, members of the species *Homo Sapiens*. It should be noted though, that it was not *her* problem Nature solved but *our* problem. In fact, Nature (after subtracting humans, and equivalent entities if they exist) does not have any problems.

Problem solved? Or problem dissolved? Yes and no. Nature or, rather, its terrestrial biosphere subsystem (largely based on the elements C, H, N, O, P, and S) certainly has (or had?) the tools and building blocks that *sufficed* to evolve mentally endowed bodies. But are they *necessary*? "If biosphere then mind is possible." is true (we are living proof of this statement). Is the reverse also true: "If mind then only in a biosphere"? In other words: "The terrestrial biosphere can bring forth mentally endowed bodies." But: "Does bringing forth mentally endowed bodies require a biosphere of the earthly type? Is a terrestrial biosphere a *necessary and sufficient* prerequisite for creating mentally endowed bodies? Is CHNOPS-'technology' the only way or are other ways possible?" This is indeed an unsolved problem. Or is it? We shall come back to it.

Of course, apart from creating mentally endowed bodies on Earth (i.e., solving *our* mind-body problem), Nature has found constructive solutions to a host of other problems (not posed by us or anybody). For instance to the problem of producing solar systems in the first place, providing inter alia the conditions for the emergence of biospheres. Many of the problems Nature has solved, keep scores of physicists busy. They

[1]It should be noted that some philosophers and scientists wonder if something they call *downward* or *top-down causation* - a force or impulse emanating from some hypothetical high level (*the mental*) - plays a major role in making us think, move, talk, employ our physical strength, et cetera (http://humbleapproach.templeton.org/Top_Down_Causation/). However, as far as Nature is concerned, the *level* metaphor, a man-made abstraction, is misleading at best. It may denote *stages of aggregation* of (elementary) parts, controlled by principles, features and forces inherent in these parts, and subject to whatever environmental initial and boundary conditions that may be relevant. Obviously, aggregation results in entities (aggregates) that are different from their parts but with features and dynamics determined by their parts. Causation at the *aggregate level* then comes down to the impact the very process of aggregation and its outcome have on the parts involved.

try to decipher Nature's ways and to convey their insights in terms of mathematically phrased *Laws of Nature*.

They figure out these laws by collecting data through observation, experiment, and measurement, and by theory building based on these data and their own ingenuity. Sometimes also through learned guessing and divining a theory. However they do it, they have to corroborate their theories by deriving *predictions* which can either be *confirmed* or *falsified* through observation, experiment and measurement. A theory is *successful* as long as its *predictions* are not proven wrong (i.e. *falsified*). Theory building necessarily involves *abstractions*, called *models*, of the particular aspects of *physical reality* (i.e., Nature's solutions) that are being studied.

But even if physicists have managed to create an (at least temporarily) successful theory, what have they actually *understood*? What does it mean to *understand* Nature's solutions? To describe in intelligible terms the way they came about and the way they work (e.g., Big Bang, inflationary universe and formation of galaxies)? Perhaps.

Here understanding (more to the point we could call it *scientific understanding*[2]) boils down to gaining and increasing *knowledge*, (for instance of the type "phenomenon A can be explained in terms of phenomena B, C and D") and using this knowledge to build physical systems of all sorts Nature has not provided so far, such as a combustion engine, an atomic bomb or high-density hard-disks. But the very notion of *energy*, for example, or of the various known *force fields*, remains in the dark. All we know is that there is something we can measure and possibly use. For this purpose we do not have to know "*what energy really is*" or "*what electromagnetism really is*". Discovering within a huge amount of data traces of a particle called *Higgs-Boson*, does not give us any insight into the essence of matter. (All we do in this case is reduce a measurable property of matter, mass, to an interaction with another measurable phenomenon, the *Higgs-Field*.) But physicists do not care what the things and phenomena they are dealing with really are. That simply is beyond modelling, definition and description. Physicists consider like questions futile, outside the realm of physics and, in fact, unnecessary, pointless. It simply does not matter (sic!).

But philosophers seem to care (and theologians by the way too). They want to know what *minds* (resp. *souls*) *really* are. After thousands of years of pondering this question left, right and centre, they still do not know (but do not stop speculating). They should acquiesce in the idea that the "*mind-in-itself*" (just like "*matter-in-itself*", "*energy-in-itself*", "*time-in-itself*", etc.) belongs to the world of *noumena*[3] – unobservable, beyond our mental faculties - or poetry, and should set a full stop to their ruminations.

The best we can hope for – given the limitations of our mental faculties - is to find out *what* minds do and *how* they do what they do. We have a pretty good idea of how minds came about. Certain mental faculties seem to have given some animals a big comparative advantage over other animals. The rest is evolution. We also have a pretty good idea of what internal body structures imply these mental faculties. There is little doubt that the key components are the brain, with its (over time) increasingly complex

[2]http://ndpr.nd.edu/news/24266-scientific-understanding-philosophical-perspectives/

[3]https://www.britannica.com/topic/noumenon

neural networks, and the sensory organs connected to it. One may add all sorts of glands whose products have a modulating influence on neural processes in the brain. And other parts of the body are of course also involved, somehow. All in all a matter of evolution.

It should by now be clear that when we say "*mind*" we actually mean the *totality of mental faculties* that allow animals (including humans) to act in their respective environments in non-arbitrary ways. And by *mental faculty* we mean the ability of a body to map (aspects of) its environment into its internal structures and to process the results of these mappings within its internal structures, often leading to observable behaviour. Studying this totality has always been within the domain of *psychology* (for humans) and *ethology* (for all other animals). Traditionally, however, both focus mainly on *behaviour* rather than the underlying internal processes. Their concern is mainly with what the mind does rather than with how it works. (Or, to put it in terms of currently popular metaphors: They are more interested in the set of *functions* of the system than in the *algorithms* inside the system that *compute* these functions.)

By contrast, exploring details of how "*the mind works*" has been within the remit of the *neurosciences* ever since it became clear that the brain with its neural structures and ancillary "devices" is the principal "*seat of the mental*". It began in earnest in the late nineteenth century with the discovery that specific parts of the brain were involved in speech production and understanding (Broca's and Wernicke's areas). More and more brain "*regions*" have been identified in the meantime as main locations of *mental* activities[4], through various methods and techniques, pertaining to, for instance, neuropathology, neurophysiology, neuroanatomy and, most importantly, neuroimaging.

The acquired data contribute to formulating *Theories of the Brain* whose ultimate purpose it is to explain (e.g., through model-based simulation) the links between brain processes and observable behaviour, including behaviour that qualifies as specifically human, such as language production and understanding and, more generally, symbol-based activity, such as reading and writing.[5]

As in the above discussed case of physics, brain theories involve abstraction in varying degrees and at different levels. They necessarily focus on selected aspects of the brain's neural material and its concomitant connections and processes. Hence every theory has a more or less limited scope as far as its predictive power is concerned. It would be difficult, to say the least, to capture the whole brain in one model. That would indeed have to be as large and complex as the brain itself. And it would probably be

[4]Hence *men*tal activities (including vision, language production and understanding, thinking, etc.) are *identical* to *neural* processes, characterised by the firing of neurons within and across brain regions. The technical metaphor together with this identity may indeed help to understand why mental activities cause behaviour. Technically, abstracting from everything else, neurons are like switches. Flipping a switch is a low-energy event that can trigger and control high(er)-energy phenomena. In this regard a neuron in the brain is very much like a transistor in an amplifier or a transistor in a computer that - upon some external event - turns on an alarm.

[5]It is, by the way, common knowledge and requires no sophisticated theory to explain that consuming certain drugs and other substances, by altering *the mind* (i.e., *electrochemical processes in the brain*), can have a dramatic and - to a certain extent - predictable effect not only on observable behaviour but also on an individual's inner experience.

quite useless for our understanding (i.e., knowledge building, see above) as well[6]. Even the masterminds of current large brain reserach projects (e.g., the *Human Connectome Project*[7] and the Human Brain Project[8]), that aim inter alia at an unparalleled collection of brain data, would probably not pretend to draw up the ultimate map of a typical human brain.

And as in the above discussed case of physics, an indication of our understanding the brain and how it works (Nature's solution of the mind-body problem!), may be the ability to put this knowledge to some use, for instance to building systems, perhaps machines, Nature has not provided so far. Here we deliberately chose almost the same wording as above. We also repeat the question: *"Is CHNOPS-'technology' the only way (to create mentally endowed bodies) or are other ways possible?"*

The answer is once again "*yes and no*". It depends on whether or not we limit the scope of the term "*mind*" to members of the species Homo Sapiens. If we do then by definition we are the only "*mentally endowed bodies*", and only CHNOPS-'technology' can produce us. This of course also holds upon extending the scope of the term to the animal kingdom. But whether Homo Sapiens can fully understand Nature's solution in terms of replicating it through artifacts that are mentally indistinguishable from the typical human mind is an entirely different question.

The answer to that question is most likely a resounding "*no*". There is no doubt that computer technology (based on an entirely different set of chemical elements!) allows us - via *intelligent design* and possibly through *neuromorphic hardware*[9] - to create *artificial minds*: in robots, in cars, in all sorts of appliances and even in distributed systems. Yet, these minds are engineered *car-minds*, *robot-minds*, et cetera, operating in their particular environments ("*worlds*"), usually much more effectively so, than we would ever be able to. By contrast, the specifically *human mind* is not only inextricably linked to its social and physical environments but also conditioned by the way it evolved (over eons) and develops (over a lifetime), and not least, by its very body; it has not been engineered[10]. And that is indeed a difference that might be impossible (to put it mildly) to overcome through digitization or other yet to be invented technologies (let alone such ridiculous fantasies like *mind uploading*).

Moreover, if we want to achieve an emulation of the human mind (i.e., brain!) that is successful in the sense of being indistinguishable from the original then we would have to ask, for example: What does *self-awareness* of an embodied physical system mean? To perceive itself as separate from its environment, to form an internal representation

[6] As Anil Seth, a computational neuroscientist at the University of Sussex, in an op-ed article in The Guardian, pointed out: even if more detailed simulations of the brain could be achieved this would "*not inevitably lead to better understanding. Strikingly, we don't fully understand the brain of the tiny worm Caenorhabditis elegans even though it has only 302 neurons and the wiring diagram is known exactly. A perfectly accurate model of the brain may become as difficult to understand as the brain itself, as Jorge Luis Borges long ago noted when describing the tragic uselessness of the perfectly detailed map.*"

[7] *http://www.humanconnectomeproject.org/*

[8] *https://www.humanbrainproject.eu/*

[9] *https://www.wikiwand.com/en/Neuromorphic_engineering*

[10] That is of course also true, *mutatis mutandis*, of dog-minds, cat-minds, elephant-minds, monkey-minds, et cetera.

of itself? How can it be tested? In what behavioural traits (or stimulus-response patterns and processes) does *self-awareness* - experiencing oneself as a subject, as a being with understanding, beliefs and volition - manifest itself? What are *inner experiences*, technically? Are "*zombies*" a theoretical and practical possibility?

Thus the *mind-body problem* (or what is left of it) is, in essence, a problem of science (to learn more and more about the human mind or, equivalently, the structures and workings of body-brain systems) and – ultimately – technology (to build increasingly sophisticated artificial minds), but *not* of philosophy. It may turn out that a full *scientific understanding* is effectively unachievable, given our mental and technical equipment, as all we can hope for are approximations. Not unlike the case of some familiar problems of meta-mathematics, one might add, although, contrary to some views, there is *no self-referentiality* involved in our case[11].

[11]Well, there may be some self-referentiality: in a way it is Nature herself who is posing a problem to herself in the form of one of her solutions (the human "mind"): How did I do it (the human "mind") and how does it work? This problem becomes indeed part of the solution.