Reasons, Persons, and Physics

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Abstract

Starting from general considerations, some ideas of the philosopher Derek Parfit on consciousness, self-awareness, and reductionism are briefly reviewed and critically examined from the standpoint of physics.

1. Introduction

The philosopher Derek Parfit, in his book entitled Reasons and Persons [1] analyses the difficult subject of consciousness and self-awareness, introducing the interesting idea of replicas of human beings. More recently the reductionist approach, which aims at explaining mind states in terms of the brain functioning has been seriously discussed [2], and quantum approaches to the subject have also been proposed [3]. In this essay, using simple and general arguments based on self-awareness (namely the subjective feeling of existing or being at a certain time and in a certain place), I wish to discuss the point of view according to which consciousness is a consequence of physical processes. As we will see, this raises difficult questions that seem to indicate that contemporary physics is unable to solve them.

2. The Continuity of the Self

Let us, initially, briefly discuss some aspects we believe are inherent to consciousness and try to clarify what is to be understood by reduction of consciousness to physical processes. Even if we finally obtain a physical description of consciousness, do we really know what consciousness is? Naturally, to really know what consciousness is we have to be conscious or aware. No physical explanation can be a substitute for this personal experience, to which philosophers refer to as the hard problem. In this respect, no explanation of consciousness can ever exist. However, we can assume that consciousness is a consequence of the physical state of a person, and conjecture that if it were possible to have two identical and indistinguishable individuals they would have to be, or at
least to feel as if they were, the very same person (we will return to this sub-
ject below). Naturally, this immediately raises a question: If these people are
in different space regions, they have different histories and are under different
physical conditions; from this point of view, they cannot, strictly speaking, be
identical individuals. However, we always assume a sort of continuity of the
self. For example, if a person can either stay at home or go to the theatre, he
or she will not become another individual because he or she decided to go, or
not to go. There are many different physical situations or states which do not
change our feeling of being ourselves. We simply know that we are in a dif-
f erent place or under different circumstances, but we are still the very same person.
Therefore, I will assume that there can, in principle, be two physically identical
individuals, in the sense of being indistinguishable from each other, even though
they can be in different regions in space.

3. Is it Possible, in Principle, to Duplicate Consciousness?

The following gedanken experiment, in which we assume the continuity of the
self, will make it evident that the reductionist approach raises some interesting
and difficult conceptual questions. If consciousness is the result of physical
processes, it is possible, in principle, to have two different individuals (different
in the sense of being in two different and distant places, for example) with the
same self-consciousness. We can try to make the argument more dramatic by
introducing the following Duplicating Machine. Let us imagine that, in the very
distant future, scientists have developed a machine that makes perfect replicas
of individuals. They are interested in sending people to Mars, to try to turn it
into a hospitable place. However, because of the very hostile conditions in this
planet, there are no candidates. To circumvent this difficulty, they suggest the
following scheme. The possible candidate will enter the duplicating machine,
which will generate two indistinguishable individuals. It is impossible to know
which one is the original and which one is the replica: they are identical to the
candidate. One of them will be sent to Mars, where he/she will not have a very
happy life, while the other, who will stay on Earth, will be recompensed. The
question then is: is it an advantage to enter the duplicating machine? Will the
candidate identify him/herself with the person who stays on Earth or with the
person who is sent to Mars? We are interested in the possible answer to the
following question: do the two individuals share the same self-consciousness?
Actually, what might it be like ‘to share the same self-consciousness’? Could
the very same person have the sensation of being at two different places at
the same time, as if his/her consciousness were split? If the answer is yes, we
will have problems with special relativity; and, at the same time, it reminds
us of the quantum entanglement, where two systems can be instantaneously
connected without apparently any kind of physical interaction between them
(more about this in section 5). On the other hand, if the answer is no, there
seem to be the following possibilities: (1) consciousness cannot be reduced to
physical processes, and (2) matter has some sort of ‘proto-consciousness’, that
is, two people can be identical and have different consciousness because they
are made of different material particles. But conclusion (2) hardly seems to be consistent with the continuity assumption and the fact that the atoms in our body are continually being changed. A third possibility (to be discussed in section 5) is to consider the continuity of the self as a sort of illusion (but who would be being deluded?).

4. The Paradox of Reductionism

Intimately connected with the problem of consciousness is the problem of free will, since there seems to be no reason to be conscious if there is no free will. In particular, consciousness would not be an advantage in the process of natural selection, as it seems to be. Every scientific project presupposes free will: we have to discuss our plans and assume, on the basis of the arguments that have been presented, that we are free to decide which experiment to perform and to establish our scientific policy. However, if our scientific project includes the reduction of our behavior to physical processes, we apparently face a contradiction. If our behavior is the consequence of ‘blind’ physical laws, whether they are deterministic or probabilistic, it does not matter, there is no room for free will, and, as a consequence, any scientific project would be meaningless. In other words, to develop a physical project we have to assume that there must be some processes which cannot be reduced to physics, that is, they cannot be included in the project [4].

5. Discussion

Starting from the assumption of the continuity of the self, we have examined, using simple and general considerations, some possible consequences of the idea according to which consciousness results from physical processes inside the brain. By continuity of the self is to be understood the consciousness feature that makes a person, at different places, on different occasions, and in different circumstances, still feel as being the very same individual. We have discussed the in-principle possibility of having two physically indistinguishable individuals, and posed the question of whether or not they would share the same split self-consciousness. If the answer is affirmative, there seems to be a problem with special relativity. For example, if one of the two individuals is destroyed, we can have a frame in which the two still coexist [5]. In this case, is self-consciousness still split or not? In which frame? It seems that a privileged frame has to be introduced [6]. This has a resemblance with the difficulties we find in quantum mechanics whenever we try to ascribe an objective reality to the state of a system that is entangled with another system [7]. In this case two systems can be instantaneously connected without apparently any kind of physical interaction between them. Similarly, if the two indistinguishable individuals share the same self-consciousness somehow they must be entangled. Although this may sound as a farfetched and preposterous idea, the alternative (there is no split of the self-consciousness), is not without its own difficulties. In this case, there seems to be the following possibility: there is no splitting of self-consciousness (or,
more specifically, self-awareness) because the two individuals, although indistinguishable, are made of different molecules, atoms and particles. In this case, sheer matter would be endowed with a sort of proto-consciousness. In some sense, our self-consciousness would be the consciousness of being made of definite individual particles. However, this idea can hardly be accommodated with the assumption of the continuity of the self and the fact that the atoms in our body are continually being changed. Strictly speaking, it amounts to rejecting the possibility of reducing consciousness to physical processes. We know that parts of our body (even the heart) can be replaced, without any modification occurring in our inner feeling of self-awareness. We still remain the very same person. We can take a step further and imagine the following fictitious scenario: if we exchange part of a person’s brain for another totally identical part, but composed of different atoms, would we have, as a final result, a person possessing a different self-consciousness? We might be tempted to borrow the idea of decoherence from quantum mechanics [8]. Two initially identical individuals become, in an extremely short time, two different individuals, because of decoherence. However, this is also hardly consistent with the continuity of the self. Moreover, it is far from clear that the decoherence approach can satisfactorily explain actualization in quantum mechanics [9], that is, the transformation of and into or. Strictly speaking, as consequence of entanglement the initial and becomes and + and + and + ... .

Perhaps, a more radical and (certainly) disputable point of view would be to assume that the continuity of the self is a sort of illusion. ‘We’ are continually becoming other individuals, with the ‘illusion’ of still being the very same person. The following example may clarify this point. Let us imagine a car whose different parts are continually replaced. After some time, we have a totally new car which looks exactly like the initial one and to which we refer as being the same car. The very same thing would happens to us. In some sense, we would be replicas of ourselves. We would be continually ‘dying’ and being ‘born’. A person would die when this process of ‘rebirth’ is interrupted. From this point of view it does not make any difference for the candidate that enters the duplicating machine whether the replica will be sent to Mars or not. The replica would not be the candidate anyway. Actually, there would be two indistinguishable individuals; even so, there would be some aspect that would make each one essentially different from the other, since they would have independent self-consciousness. From this way of thinking – highly questionable, in my opinion – the continuity of the selves can be seen as being equivalent to a succession of replicas. In some sense, we would live only a short time, determined by the time duration of the processes inside the brain responsible for the self-consciousness feeling. In other words, the plans we make for our future are actually not plans for our future, they are plans we make for replicas that will live in the future and will inherit our memories.

We have also seen that the reductionist approach leads to a sort of paradox. To the extent that it presupposes a scientific project, it assumes free will. But blind laws of physics, ruled by mathematical equations, with no purpose, leave no room for free will. Actually, we have no choice to decide about our genetic
inheritance and about the place, the time, and the circumstances in which we
are born, namely factors that shape our behavior. So maybe we are not free
after all. But then, what is the reason for being conscious, and feeling pain and
pleasure, and being sad and happy?

Very probably, in order to unify mental and physical processes, we will need a
physics in which, somehow, features implicitly connected with mental processes
are already incorporated in its foundations, which is not exactly the same as
saying that mental processes will be reduced to physics. Making physical copies,
or replicas, of minds may be an impossibility, even in principle. Each individual
is connected to the environment. As a consequence, although it may be possible,
 atleast in principle, to substitute the human mind by an identical physical
structure made of different atoms, it may not be possible to exactly remake this
external connection that results of the personal history of each individual. In
this respect, a human being would not be capable of being reduced to its phys-
ical components. When you perform this replacement you break the external
connections.

It is interesting to highlight the active role of the scientist in the use of the
laws of physics, which can make room for the introduction of mental processes
into these very laws. The laws of physics can be interpreted as establishing a
program, which consists of seeking to fit the facts into a given structure. In
the case of classical physics, and taking Newton’s second law of dynamics as an
example, we assume that, given a concrete situation, it is always possible, at
least in principle, to find an $F$ and an $m$ that satisfy the equation $F = ma$. We
don’t need to get involved in a vicious circle trying to define $F$ in terms of $m$ and
$m$ in terms of $F$. Similarly, in quantum mechanics we assume that it is always
possible to associate a state vector with a system, that this vector will evolve
satisfying the Schrödinger equation, and that, given a concrete situation, we
can identify a projective measurement. This explains why quantum mechanics
is so effective, despite its widely varying interpretations.

References

[1] D. Parfit, *Reasons and Persons* (Oxford University Press, 1984). A few years
ago a first version of this essay was shown to Professor Ulysses Pinheiro of
the Department of Philosophy of UFRJ (Universidade Federal do Rio de
Janeiro), to which I thank for having drawn my attention to Parfit’s book
and to the fact that the idea of replicas had already been introduced by
Parfit.

[2] F. Crick, *The Astonishing Hypothesis: The Scientific Search for the Soul*
(Simon and Schuster, 1995); R. Penrose, *The Large, the Small, and the Hu-
man Mind* (Cambridge University Press, 1997); A. Damásio, *The Feeling
of What Happens* (Harcourt Brace, 1999); G. M. Edelman and G. Tononi,
*Consciousness: How Matter Becomes Imagination* (Penguin Books, 2001).
Edelman and Tononi adopt what they call ‘the physics assumption’: ‘The
physics assumption states that only conventional physical processes are required for a satisfactory explanation of consciousness – no dualism is allowed. In particular, we assume that consciousness is a special kind of physical process that arises in the structure and dynamics of the brain.

[3] H. Atmanspacher, *Quantum Approaches to Consciousness*, in The Stanford Encyclopedia of Philosophy (Summer 2020 Edition), Edward N. Zalta (ed.). The interested reader can also consult the article *Quantum Mind* in the Wikipedia, for more information and references in this inexhaustible subject.

[4] The collapse of the state vector in quantum mechanics might be an indication that the reductionist approach is inevitably limited.

[5] We know that two events separated by a space-like interval cannot be causally connected, and that absolute simultaneity can only exist for events that occur at the same time at the same place. We can imagine the two indistinguishable individuals distant from each other and in different Lorentz frames.

[6] The introduction of a privileged frame is discussed by John Bell in “How to teach special relativity”, reprinted in J. S. Bell, *Speakable and Unspeakable in Quantum Mechanics* (Cambridge University Press, 1989), and advocated in D. Bohm and J. B. Hiley, *The Undivided Universe: An Ontological Interpretation of Quantum Theory* (Routledge, 1993).

[7] According to J. F. Clauser and A. Shimony, *Bell’s theorem. Experimental tests and implications*, in Rep. Prog. Phys. 41, 1881 (1978), it follows from Bell’s theorem and the Einstein-Podolsky-Rosen correlations that we have to abandon either realism or locality.

[8] W. H. Zurek, *Decoherence and the Transition from Quantum to Classical*, Physics Today 44, 36 (1991); R. Omnés, *Understanding Quantum Mechanics* (Princeton University Press, 1999).

[9] F. Laloe, *Do we really understand quantum mechanics?* Strange correlations, paradoxes, and theorems, Am. J. Phys., 69, 665 (2001). A. J. Leggett, *Probing Quantum Mechanics Towards the Everyday World*: *Where do we Stand?* CONDENSATION AND COHERENCE IN CONDENSED MATTER. Proceedings of the Nobel Jubilee Symposium. Held 4-7 December 2001 in Göteborg, Sweden. Edited by T Claeson (Chalmers University, Sweden) & P Delsing (Chalmers University, Sweden). Published by World Scientific Publishing Co. Pte. Ltd., 2003. ISBN #9789812791269, pp. 69-73 Pub Date: October 2003