CONTINUITY, TIME, AND "ARTIFICIAL INTELLIGENCE"[1]

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ABSTRACT: This paper argues against the paradigm of mechanistic reductionism in relation to consciousness. The paradigm impoverishes reality by dismissing the greater part of the experienced world in exchange for control over a small segment. The distortion limits nature with respect to the concept of time and mistakenly defines consciousness as a "property." The concept of time in the paradigm provides no way to account for *remembering* other than storage and mechanical retrieval of records of past events, erroneously called "memories." The error is the conversion of verbs into nouns: taking *actions* as bytes and bits of data. Once this is allowed, the idea that the person is the mind, the mind is the brain and the brain is a computer becomes the bedrock upon which the edifice of AI rises beyond its capacity as a useful tool and betrays humanity by blurring the distinction between self and machine. An alternative view is introduced which suggests the idea of Developmental Time instead of Physical Time and replaces "consciousness" with "experience."

KEYWORDS: Continuity, Time, Personhood, Person, Consciousness, Nature, Reality, Mechanism, Reductionism, Teleology, Memory, Neo-Darwinism, Physics, Criticism.

In her book *Maps of the Mind,* science writer Rita Carter put forward a theory, based on findings of Neuroscience, that every human being is a "programmable machine." More specifically, our brains are computing machines and we are our brains.[2] This view evokes the following equation: Person = Mind = Brain = Computer, or PMBCI

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[2] Carter 1998, 207.

(the Person, the Mind, the Brain and the Computer are Identical). This theory relies on several serious flaws of conceptual confusion, and others have taken her views to task for those errors, but among enthusiasts and researchers pursuing the development of "Artificial Intelligence" conceptual errors such as those committed by Carter are not merely ignored, they seem to be invisible. For many, the distinction between humans and machines has virtually disappeared.

The ease with which large segments not only of the scientific world, but of the general public as well, accede to this idea is not difficult to understand. It suits physics, where mechanistic reductionism applied to such unruly things as "consciousness" is the favored paradigm. It is also a view long entrenched in popular culture via science fiction, where sentient robots such as R2D2 and C3PO are merely the latest versions of machines which think, feel, care and behave like humans but have computers for "brains". These are accepted as characters on an equal standing with their flesh and blood compatriots.

A singular advantage of PMBCI is that it can be understood as a solution to the long-standing problem of mind-body dualism, the view that there is an absolute separation between mind, consciousness and self on the one hand and the physical body on the other. PMBCI would eliminate any remnant of dualism simply by calling the mind a computer located in the cranium. Somewhere in the intricacies of the brain-computer is a neuron, or a group of them, which "generate" a property called consciousness.

For a time, it was indeed thought that the brain operates as a computer. An important example of this is that memory, in a real human being, has been understood as the recovery of "memories" stored somewhere in the neurons of the brain. Since that is precisely how computers "remember" things as well – by storing data in digital form in "memory banks" and accessing the data when needed by means of programmed algorithms, the analogy between memory in computers and memory in persons seems perfect.

This is the ubiquitous *storage theory of memory*, and it is so widely accepted that one would not be far off base by saying it is universally understood to be how memory works. The trouble is that this widespread presupposition about remembering is seriously flawed, but to challenge it goes so violently against the dominant paradigm of present thinking that to suggest it is wrong is simply to ask for instant dismissal, accompanied by a stupendous horselaugh from just about everyone.

The underlying reason for the dismissal of objections to the storage theory is that the theory goes contrary to the dominant paradigm. This paradigm of scientific presuppositions has achieved near-universal acceptance, because physics – or to be more precise, the mathematical formulae that make up its language of description –

has come to be understood as *the* science that describes the fundamental nature of everything, with its corollary that whatever physics cannot describe must be illusory. As one noted physicist has said, we and everything around us are only "atoms and empty space," and to think otherwise is to give in to a "figment of imagination."[3]

The dominant paradigm is based on three related ideas. The first is the view of time employed in physics (and accepted by just about everyone else). This view is what has been called geometrical time, or physical time. It is geometrical, because it is derived from the notion that time is a further dimension of space, and a time-line is a line of units of measure just as the three dimensions of space are also identified by lines of discrete homogenous units of measure. The second idea is the theory of neo-Darwinian evolution, in which time begins from an unexplained "singularity" with the so-called "Big Bang." This is conceived of as an explosion of energy, which proceeds to condense into the subatomic particles making up what we understand as matter.

At this point we arrive at the necessity for an explanation of how it is that "atoms and empty space" have apparently gone through a process eventuating in the existence of something that is inexplicable in physical terms. That something is Life, with its corollary of purposive behavior. Such behavior must exist to satisfy the doctrine of "survival of the fittest," since the concept of "fittest" has no meaning whatsoever as far as inanimate matter is concerned. For a stone, for instance, to "survive" it would have to remain unchanged over time. Given such things as heating, cooling, and erosion, even a stone cannot remain unchanged. But if the stone persists in the same state (not counting internal molecular or atomic-level motion) for even a few moments, the idea that it is "surviving" would have only a material meaning and have nothing to do with the survival of a living organism.

What is alive *survives* only when it maintains a certain equilibrium among the many interpenetrating functions that individually serve themselves while collectively serving the ongoing metabolic processes of living. In very elementary organisms this may be constituted by continuation of simple nutritive functions. The mark of a living organism is that it is made up of functional systems that are interrelated and are nothing at all like what is found in inanimate matter.

By this route we come, then, to the problem of explaining the existence of life within a field of dead matter. It is not my purpose here to engage further in discussion of this problem, other than to point out that while science has attempted to explain the advent of life from random encounters of matter, it has failed to do so in any

[3] Ferry 2010. The view is self-nullified because its reference to our imagination ignores the question as to how atoms and empty space might imagine anything at all. This error is an example of how many physicists and other scientists are lacking in fundamental principles of conceptual analysis.

convincing way. Most importantly, it cannot create life out of dead matter by any physical means. And if you cannot explain the development of life from dead matter, you cannot also explain the existence and nature of memory; for memory requires *experience*, and only living things have experience. What is remembered is what is experienced. So suddenly our discussion has entered the field that has been awaiting us all along, the field of experience and the remembering of what is experienced.

One of the serious conceptual problems that afflict efforts to answer the question of "what is consciousness?" is the common characterization of "consciousness" as referring to some sort of *property*. Matter, after all, may possess properties, so perhaps consciousness is a property of the mind generated by certain neurons in the brain. It is this characterization that leads researchers into futile endeavors to locate the source or cause of this "property" in the brain. If we ask what possesses this property, the common answer would be persons, but if you pay attention to the ethologists, what has consciousness may be most – or perhaps all – other living organisms as well.[4] This idea is a shock to the dominant paradigm, and it hints of an alternate and corrective paradigm.

In seeking to identify such an alternate, we would do well to abandon the weasel-word "consciousness" and substitute "experience" for it instead. The question becomes "what is it that has experience?" Persons, and most certainly other things that live, experience things. And they remember what they experience. Once this change of emphasis from "consciousness" to experience, and from persons to life, occurs, ask yourself whether your computer experiences anything. Then ask whether any machine, or anything that is not a living organism, has experience.

To start asking questions like this is to move away from the constraints imposed on theory by the dominant paradigm. It is a move away from the presuppositions of mechanistic reductionism, neo-Darwinian evolutionary theory, and the role of time in relation to memory. To give these ideas substance, we will consider the difference between Physical Time and what I will be referring to as Developmental Time.

When you lay a ruler along the side of an object – let us say it is the spine of a book – and you observe that the book is 10 inches long, the book is not divided into discrete units called inches. It is only the measuring tool, the ruler, that is divided. After all, the book is also 25.4 centimeters long, but the *book* does not consist of 25.4 discrete units stuck together any more than it is made up of 10 other units. The same applies to the temporal measurement of an era, or a year, or even a moment.

The smallest possible unit of time measurement is about 10^-43 seconds, which is

[4] See De Waal, 2016.

called Planck time. (One unit of Planck time is the time it takes for light to travel 10^-35 meters, which is about 10^20 times smaller than an atomic nucleus.) Let us imagine a ruler divided into Planck units, and we lay this ruler along a series of events that occurred over a period of 50 years. In the very first Planck unit of time as measured on our ruler, the first in the series of events we are measuring occurred. And in the next Planck unit, the next event occurred, and so on for the entire 50-year period. Our question is this: Just as the first time interval is over and the next occurs, is the event whose time of occurrence is being measured by the first unit also over? Or does it still exist in some way? Another way of putting it is to ask whether the events occurring over the 50 year period are themselves divided into pieces each lasting no more than one unit of Planck time, or are they, like the spine of the book, simply one continuously existing series of events being measured by means of arbitrarily chosen units?

Surely, and this is the common view, once each event occurs at a given instant of Planck time, it is over. It is in the past, and no longer exists. This is also true of the corresponding moment of Planck time. It, too, has passed, to be followed by the subsequent moment on our time ruler. So, both the time measured and the event occurring at that time are now gone. They disappear together. They are over. Done with. Irretrievable. This means there is a correlation between the existence of the unit of time measurement and the event being measured. The event lasts just as long, and no longer than, the Planck unit assigned to it. This is what we are calling **Physical Time**. It is the time the physicist uses. Once a unit of time measurement expires, both the time unit *and* the event occurring at that instant disappear into the past.

Everyone agrees to this. The past is past. Then they erroneously imagine that the only way to remember past experiences is to catch them, like a fisherman or a butterfly enthusiast with a net, before they can get away, and store them in jars – or if they are experienced events, store an account or image of them in the brain.

The problem, however, has to do with what we have been measuring with our time ruler of Planck units. The events happening at a certain instant of Planck time disappear as soon as the Planck instant of time is over, because the past *is* the past. What we are measuring with our time ruler in this example is the sequence of events happening over time, and it is the inherent meaning of that sequence that each bit of it is gone into the past as soon as it happens. When physics deals with time, it is this kind of time that is being used. This is what we are calling Physical Time.

Now, however, we must not forget the difference between what is being measured and the ruler being used to measure it. The ruler itself is not stuck to whatever it measures. It may measure any series of things happening in time and correlate its series of instants of time with moments taking place in what is being measured. Surely though

this must sound a bit loopy, for what else could we measure with a ruler made up of a series of time intervals? Well, there is something else we can measure but in doing so we will no longer be measuring physical time. We will be measuring *experienced* time, which we will eventually wish to call developmental time.

Let us, then, imagine another scenario. As before, we lay out a Planck time ruler. But instead of the ruler being laid along a series of events, this time it is laid along what someone who is *observing* these events *remembers* about them. In this case, as before, the first unit of Planck time is gone once it has occurred. But does the person's memory of the occurring event also disappear as soon as the Planck instant is over? This is the crucial question. It is crucial because if the memory of the event, just like the time instant measuring it, is over as soon as it happens, then 50 years from that moment the person who experienced the event *would have no memory of that event* – unless they managed somehow to store a digitalized version of the event lasting only a Planck moment on top of another event lasting a Planck moment on top of another, and another, and another until, if they don't go insane from the strain, they have managed to lay thousands of thousands (actually 10^43) of Planck moments of memory upon the others to achieve and store a "memory" of just one second of experience.

But recall that we are exploring alternatives to the dominant paradigm of Physical Time, and we are measuring the flow of the person's memories with that time ruler, not the flow of physical events. We do not wish to revert to the dictum of Physical Time when it measures events that disappear into the past. Our question should be this: does our memory of an event disappear into the past as soon as we experience it, or not?

A number of philosophers, whose works have come to be ignored since the mid-20th century, have proposed a developmental cosmology, with a developmental time frame.[5] Among them, the French philosopher Henri Bergson proposes that the concept of Physical Time has a specific utilitarian value in relation to what he calls real time, but real time is itself not the same as physical time. What constitutes real time, he argues, is Durational Time. He calls it this because without it, personhood could not exist because it is the essence of a person to endure, not to be created and recreated repeatedly, instant by instant, by calling up an infinite number of "memories" an infinite number of times and thereby depending for their personhood on an infinite regress of algorithmic accesses to infinitely large memory banks of an infinite number of experiencing events lasting as short a time as one Planck unit of time.

To illustrate this concept of Durational Time. Bergson points out that unless a we accumulate a continuously operative memory of everything experienced, we would

[5] See McDaniel 2017, Chapters 7 and 8.

end up as functionally fragmented entities – more like robots with computers for brains.[6] In short, we would end up as Rita Carter proposes: programmable machines. The alternative view Bergson proposes is that we remember everything. Every instant of our experience. And to do so is to have consciousness. Consciousness, on this view, is a function of our experience of Durational Time. Memory is what defines beings which endure, perhaps not permanently, but for the time of their living. There are of course many ramifications of this theory of memory which must necessarily by addressed, and these Bergson has addressed exhaustively, finding a utilitarian role that Physical Time may play in the service of the more fundamental Durational Time.[7]

If this analysis of memory and the logically necessary role it plays in the existence of personhood and consciousness is correct, the PMBCI view of things is not only false, it is a dangerous reduction of our understanding of what, and most importantly who, we are. It is possible that there can be no science capable of encompassing either experience, consciousness, and what possesses these, namely life itself. Life is Psyche, or "breath" as Aristotle told us so long ago, and perhaps only Psyche can discover itself.

It has been my contention that the "dimensions" of existence as understood in Physics, which are geometric abstractions, are not the dimensions within which Life (which is not a mathematical abstraction) exists. If I am correct, then the only possible science of Life – must expand beyond Physics, which is capable of explaining only that which is dead.

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[6] Unlike living things, the functions of machines do not exist for the maintenance of themselves while at the same time existing for the maintenance of the total formation to which they are attached. (They are not integral both to themselves and to the totality of the machine.)

[7] See note 4.

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