

Dear Giulio Tononi:

You are looking for an explanation of consciousness, and in my view, you are starting in the right place. In a recent interview by Robert Lawrence Kuhn, you start with what you call “axioms” of consciousness (existence, composition, information, integration, and exclusion). They describe what Descartes had in mind when he argued, I think, therefore I am, and you are agreeing with Descartes’ conclusion when you say that “consciousness is everything we are.” But you wisely refuse to follow Descartes in using the Cogito to prove the existence of mind. You are a scientist, so instead of using it as a standard of indubitability by which to show reason can know with certainty what really exists outside consciousness, you take the existence of the natural world for granted, and knowing that consciousness must be part of it, you ask “what out there can explain its existence.”

But you go wrong, I believe, when you say that consciousness is identical to a “maximally organized conceptual structure” and expect to explain it by showing how it is “generated by a particular part” of the brain. You have a mathematical definition of that structure, and assuming that having a definable quantity makes information an object for study by science, you believe that showing how its structure is generated by a part of the brain can explain consciousness. This is understandable since many branches of science now use information as a cause in explaining the regularities they study. But that is to reify information, and that mistake will be corrected when it is reduced to causes discovered by the basic branch of science.

I predict that physicists will soon make a discovery that solves the intractable puzzles of modern physics and triggers a scientific revolution in which information is explained as an effect of a cause not previously recognized by physics. Recognition of it will

enable neuroscience to explain the mammalian brain as a faculty of imagination, and combined with another implication of the discovery by physicists, neuroscience will explain consciousness as the intrinsic nature of a particular part of the brain, rather than something nonphysical generated by it. I know that the prediction of such a scientific revolution seems unlikely, and though I cannot give all my reasons here, I can convey the gist of it. I am asking you, as someone who believes in the rational pursuit of truth, to consider it and tell me where it goes wrong.

I predict that the problems of modern physics will be solved by the discovery that space is a substance that interacts with matter. This possibility has been hidden from physics for centuries by its assumption that laws of physics are the deepest possible knowledge about the natural world. The secret sauce that has made physics so successful for centuries is the use of mathematics to formulate its laws. But it has trapped physicists inside a box, and they will not solve the intractable problems in modern physics caused by it until they wonder about the “unreasonable effectiveness” of mathematics in discovering laws of physics and think outside that box by questioning whether it is known by a faculty of rational intuition. When they consider the possibility that the natural world is constituted by substances that endure through time, they will discover that mathematical truth can be explained by its correspondence to the world. Given that change is what happens as substances interact with one another, they will infer that the natural world is constituted by space and matter because their interactions can generate only quantitatively precise regularities, because that is the best explanation of the “unreasonable effectiveness” of mathematics in discovering laws of physics. They will confirm that mathematical truth depends on its correspondence to the natural world when they discover specific powers by which interactions of space and matter

generate the regularities described by laws of physics because that will solve all the problems of modern physics.

I predict that this ontological discovery by the basic branch will trigger a revolution in science. The way that interactions of space and matter generate the regularities described by laws of physics will reveal a second kind of efficient cause, and recognition of what I call geometrical efficient causes will give biologists a more complete understanding of the cause of evolution that enables them to show that a series of inevitable stages of evolution, caused by a series of levels of geometrical organization, brings beings like us into existence on suitable planets throughout the universe. The level of geometrical organization responsible for the stage at which mammals evolves will reveal that the function of the basic structure of the mammalian brain is to serve as a faculty of naturalistic imagination. That will enable neural scientists to use the homology between the anatomically distinct hindbrain, midbrain, and forebrain of the reptilian brain and three distinct thalamocortical circuits in the mammalian forebrain to explain how the mammalian brain serves as a faculty of imagination for guiding behavior.

The explanation of how consciousness is part of the natural world depends not only on this explanation of the mammalian brain but also on another consequence of the discovery that bits of matter coincide with parts of space.

Since matter is a substance, scientists can assume that a purely phenomenal way of existing in itself is part of its essential nature. That is, the existence of a qualitative property of some kind is what it is like to be a bit of matter in the world. Since bits of matter coincide with parts of space, their species will be distinguished by the spatiotemporal structures of their coincidence with space. Though the existence of a primitive qualitative property is presumably what it is like to be the simplest bits of matter, it is

possible for a single bit of matter to have a kind of spatiotemporal structure that is complex enough to explain the configurations of sensory qualia in phenomenal space that are immediately present when we perceive the natural world. If the faculty of imagination is responsible for this structure, there is one and only one bit of matter helping constitute the mammalian brain that fills this bill. It is the species of field matter that mediates the electromagnetic interactions among ions accelerated in the firings of neurons. Their firings impose a spatiotemporal structure on this field matter (called the electromagnetic field in physics), and since matter has a phenomenal intrinsic property, this bit of field matter can explain what you describe as a “shape in qualia space . . . generated by a particular part of the brain.” But its “shape” depends on the mammalian faculty of imagination, and “qualia” is not just information because it is explained ontologically. Consciousness is what it is like to be the mammalian brain. It is the existence of configurations of sensory qualia in phenomenal space constituted by a particular bit of field matter that helps constitute the mammalian brain.

You start with a description of consciousness that Descartes would accept, and the ontological reduction of science will give you a way of explaining how it exists “out there” in the natural world. Though you must accept a form of panpsychism, it is such a modest form that it doesn’t contradict the laws of physics. In fact, it entails epiphenomenalism. Since consciousness is what it is like to be a particular bit of field matter helping constitute the mammalian brain, it is just the immediate presence of phenomenal properties, and that can’t cause anything to happen that is not fully determined by efficient causes. Though what is known by science will not falsify this way of explaining how consciousness exists in the natural world, it poses another problem. Epiphenomenalism makes it puzzling how we know that we are conscious. But spatio-materialist panpsychist

epiphenomenalism gives back what epiphenomenalism takes away. It also gives you a way of explaining knowledge of consciousness.

You start by agreeing with Descartes about the unity to consciousness. That makes it seem that we are “inside consciousness,” or as you put it, “consciousness is everything we are.” But since you do not follow Descartes in using the Cogito to prove the existence of mind, you avoid being taken in by an illusion that it describes. But he argues, I think, therefore I am, so he assumes that the immediate presence of phenomenal properties is what causes our knowledge of them. That is to assume that knowledge depends on objects given in a faculty of intuition, and since that is false, I call it the illusion of intuitionism. It is an implicit assumption of all mammals because they are inside consciousness and everything they know seems to be a phenomenal property. But as a scientist, you are a language-using mammal who takes the existence of the natural world for granted, and when you try to explain how consciousness is part of the natural world, you refuse to be taken in by the illusion of intuitionism. Knowing how this illusion is caused by the unity of mammalian conscious, you will discount the illusion of intuitionism, and that will enable you to explain how we know that we are conscious as something we learned from Descartes.

Surprisingly, knowledge of consciousness was a historical discovery. Since Descartes was taken in by the illusion of intuitionism, his attempt to prove the existence of a world external to mind revealed that its nature was just opposite to mind, and that is how he discovered consciousness. Mind was a substance with the unity of consciousness, but since he used rational knowledge of mathematics to describe the essential nature of the substance existing independently of mind, he discovered that the external world had a divisibility that is just opposite to the unity of

mind. The substance constituting mind had to be radically different from the substances constituting a world in which substances exist outside one another in space, and since their ontological incompatibility precluded explaining how mind and body interact, it doomed modern metaphysics. But it was the discovery that we are conscious.

This historical explanation of our knowledge of consciousness also explains why the problem of mind is so hard for physicalists. They start with the external world discovered by Descartes because scientists are naturalists who assume the existence of the natural world, and since a science based on physics is atomistic and cannot explain how consciousness is part of the natural world, it cannot explain knowledge of consciousness. So, when physicalists claim to know they are conscious, they are falling for the illusion of intuitionism, and the belief that knowledge is caused by the immediate presence of phenomenal properties is incompatible with the completeness of physical causes. Ironically, physicalism is also caused by the illusion of intuitionism. The use of mathematics as a language for describing regularities about change depends on the assumption that it is known by a faculty of rational intuition (which can also be traced to Descartes), and the assumption that mathematically formulated laws of nature are the deepest possible knowledge of the natural world entails monism and the kind of divisibility that is incompatible with the unity of mind. That is the obstacle that this explanation of consciousness overcomes by starting with the prediction of the discovery about space being a substance.

The lesson to be taken from this historical explanation of how we know that we are conscious is that all the confusion about its nature comes from failing to distinguish between consciousness and reflection. Consciousness is what it is like to be a bit of field matter that helps constitute a mammalian brain, while reflection is

the way that mammalian brains use language to represent the brain states causing their behavior as part of the very process of causing it. This solves the mind-body problem. But it is just one consequence of the prediction of the discovery about space I predict. When a science based on ontology explains Western philosophy in this way, science becomes perfect knowledge of the kind that intuitionistic metaphysicians sought. It is Reason knowing Reality behind Appearance. But since science is based on the empirical method, rather than intuitionism, it is naturalistic reason. A trilogy, called Naturalistic Reason, that I am self-publishing as I send you this message, spells out in detail the many consequences of the discovery that I predict physicists will make.

The first volume, Unification of Physics, describes ontological mechanisms that explain all the laws of physics in quantitative detail. The second volume, the Unification of Science, shows how the ontological reduction of physics reveals a kind of efficient cause, not recognized by physics, that works together with physical causes in a way that will enable all the specialized sciences to explain completely the regularities they study. That reveals that the overall course of evolution on suitable planets includes a series of inevitable stages that brings about the existence of beings like us, and the third volume, the Unification of Science and Philosophy, uses this ontological explanation of how consciousness is part of the natural world to explain Western civilization as a distinct stage in the evolution of life caused by the exchange of metaphysical arguments in which consciousness is discovered and science begins. It shows how this way of solving the mind-body problem turns ontological science into a cognitive power that knows Reality behind Appearance, called natReason for short.

There may be incomplete or mistaken arguments in this trilogy. But I am confident that the discovery about space will cause a scientific revolution. And since I know this sounds too good to be true, let me say something about its origin and scope. I have been working on this argument, pretty much on my own, for over 45 years, including 30 years teaching philosophy at American University and more than 20 years since retiring from teaching. As a philosopher, I have written the detailed argument with a rigor that justifies expecting it to stand up to scrutiny in the rational pursuit of truth. I am writing to you and a few others because I want to make what I have discovered public. I am about to turn 83, and since I have been given the leisure to enjoy a life spent in this exceptionally fulfilling way, I believe that making it public is my duty. I am hoping that as someone who believes in the rational pursuit of truth, you will help give this argument a public hearing.

Even those who believe in the rational pursuit of truth will be reluctant to take up a detailed all-inclusive explanation of the natural world in three volumes, so I am offering a simpler way of learning more about it. An executive summary of the argument is presented in a short (150 page) book titled *Sapere Aude* that I am also self-publishing now. I am including a free Amazon link to an eBook version of it. (See below.) And there is more information about this argument at natReason.com, including an introduction to the trilogy, a Table of Contents for it, a bookstore, and more information about me. I would be happy to answer any questions you may have and very grateful to learn about any problems that you think casts doubt on it. You can reach me personally at phillipscribner@yahoo.com.