Mind, Emptiness, and Quantum Physics

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The Materialist View of Consciousness

Stephen Hawking:

- "The human race is just a chemical scum on a moderate-sized planet, orbiting around a very average star in the outer suburb of one among a hundred billion galaxies. We are so insignificant that I can't believe the whole universe exists for our benefit. That would be like saying that you would disappear if I closed my eyes."

- "I think the brain is essentially a computer and consciousness is like a computer program. It will cease to run when the computer is turned off. Theoretically, it could be re-created on a neural network, but that would be very difficult, as it would require all one's memories."

Re-assessing Consciousness

Andre Linde (Harald Trap Friis Professor of Physics, Stanford University):

- "The current scientific model of the material world obeying laws of physics has been so successful that we forget about our starting point—as conscious observers—and conclude that matter is the only reality and that perceptions are only helpful for describing it. But, in fact, we are substituting the *reality* of our experience of the universe with a conceptually contrived *belief* in an independently existing material world."

- "Is it possible that consciousness, like space-time, has its own intrinsic degrees of freedom, and that neglecting these will lead to a description of the universe that is fundamentally incomplete? What if our perceptions are as real (or maybe, in a certain sense, are even more real) than material objects?"

Buddhist Contemplative Access to the Form Realm

Vajirañāna Mahāthera (*Buddhist Meditation in Theory and Practice*):

Upon achieving the *jhānas* through meditation on the *kasiṇas* of the elements, one perceives "counterpart signs" that derive from the form realm. These signs appear as rarefied, archetypal representations of phenomena experienced in the desire realm, including the elements of solidity, fluidity, heat, motility, the four colors of blue, yellow, red, and white, and light and space. By mastering these counterpart signs of the elements, physical reality may be altered by the contemplative manipulation of these archetypal representations.

A Buddhist Special Theory of Ontological Relativity

- The physical world as we experience it (*kama-dhātu)* emerges from the form realm (*rūpa-dhātu*) populated by universal, archetypal forms (*nimitta*).

- The form realm emerges from a subtler dimension of existence known as the formless realm (*arūpya-dhātu*).

The Mathematicians' Realm of Pure Forms

Roger Penrose (*The Emperor's New Mind*):

"I imagine that whenever the mind perceives a mathematical idea, it makes contact with Plato's world of mathematical concepts….When one 'sees' a mathematical truth, one's consciousness breaks through into this world of ideas, and makes direct contact with it….When mathematicians communicate, this is made possible by each one having a *direct route to truth*, the consciousness of each being in a position to perceive mathematical truths directly, through this process of 'seeing'….Since each can make contact with Plato's world directly, they can more readily communicate with each other than one might have expected. The mental images that each one has, when making this Platonic contact, might be rather different in each case, but communication is possible because each is directly in contact with the *same* externally existing 'Platonic world!'"

A Scientific Special Theory of Ontological Relativity

- Carl Jung proposed the existence of dimension of reality called the *unus mundus*, a unitary domain of archetypes that can manifest as configurations of mental and physical phenomena.

- Wolfgang Pauli proposed that mind and matter emerge by a breakdown of the psychophysical symmetry of the *unus mundus*. In this model, mental processes emerge as psychic manifestations of archetypes, and physical laws emerge as physical manifestations of archetypes.

A Buddhist General Theory of Ontological Relativity

- According to the "Middle Way" view of Buddhism, everything that we apprehend is devoid of its own inherent nature, or identity, independent of the means by which it is known.
- Perceptual (empirical) objects exist only relative to the means by which they are perceived or measured.
- Conceptual (theoretical) objects, exist only relative to the minds that conceive of them.

A Scientific General Theory of Ontological Relativity I

John Archibald Wheeler:

- The universe consists of a "strange loop," in which physics gives rise to observers and observers give rise to physics.
- The conventional explanatory relationship of "matter → information → observers" is inverted: "observers → information → matter"
- The universe is fundamentally an information-processing system from which the appearance of matter emerges at a derivative level of reality.

A Scientific General Theory of Ontological Relativity II

Anton Zeilinger:

"One may be tempted to assume that whenever we ask questions of nature, of the world there outside, there is reality existing independently of what can be said about it. We will now claim that such a position is void of any meaning. It is obvious that any property or feature of reality "out there" can only be based on information we receive. There cannot be any statement whatsoever about the world or about reality that is not based on such information. It therefore follows that the concept of a reality without at least the ability in principle to make statements about it to obtain information about its features is devoid of any possibility of confirmation or proof. This implies that the distinction between information, that is knowledge, and reality is devoid of any meaning."

A Scientific General Theory of Ontological Relativity III

Thomas Hertog:

"You can think of that quantum reality a bit like a tree. The branches represent all possible universes, and our observations—we are part of the universe, so we are part of that tree—and our observations select certain branches, and hereby give meaning, or give reality, to our past in a quantum world…Quantum theory indicates we may *not* be mere chemical scum. Life and the cosmos are, in the quantum theory, a synthesis, and our observations now give in fact reality to its earliest days."

The Transcendent Ground of Reality

- The physical world emerges from an implicate unity of the absolute space of phenomena (*dharmadhātu*), primordial consciousness (*jñāna*), and a primal energy (*jñāna-vayu*) that is indivisible from both space and consciousness.

- The perfect symmetry of this ultimate reality exists in the "fourth time," beyond the distinctions of past, present, and future.

The Dualistic "Freezing" of the Universe

Düdjom Lingpa:

"This ground is present in the mind-streams of all sentient beings, but it is tightly constricted by dualistic grasping; and it is regarded as external, firm, and solid. This is like water in its natural, fluid state freezing in a cold wind. It is due to dualistic grasping onto subjects and objects that the ground, which is naturally free, becomes frozen into the appearances of things."

The Problem of Frozen Time

- Without introducing an observer, we have a dead universe, which does not evolve in time, implying the vital role of the participant in the self-observing universe.

- The universe becomes alive (time-dependent) only when an observer-participant divides it into two parts: a subjective observer and the rest of the objective universe, and the wave function of the rest of the objective universe depends on the time measured by the observer.

- The evolution of the universe and everything in it, including life itself, is possible only relative to an observer-participant.

The Ontological Relativity of Time

- Albert Einstein: “For those of us who believe in physics, this separation between past, present and future is only an illusion.”

- John Archibald Wheeler: “It is wrong to think of that past as ‘already existing’ in all detail. The ‘past’ is theory. The past has no existence except as it is recorded in the present. By deciding what questions our quantum registering equipment shall put in the present we have an undeniable choice in what we have the right to say about the past.”

- Stephen W. Hawking: Every possible version of a single universe exists simultaneously in a state of quantum superposition. When you choose to make a measurement, you select from this range of possibilities a subset of histories that share the specific features measured. The history of the universe as you conceive of it is derived from that subset of histories. In other words, you choose your past.

The Ontological Relativity of Space

- The universe began in a perfectly symmetrical but unstable vacuum, in which all the forces of nature were undifferentiated.
- As the universe expanded, it went through several symmetry-breaking phase transitions, which led to the distinction of the forces into gravitational, weak, electromagnetic, and strong forces.
- The current vacuum has much less symmetry than the original, high-temperature vacuum, much as ice is much less symmetric than liquid water. As the universe cooled down, transitioning from the state of the "melted vacuum" to the current "frozen vacuum," the initial symmetry was broken in various ways.
- Steven Weinberg: This vision of the world we see around us is "only an imperfect reflection of a deeper and more beautiful reality."

The Emptiness of Space-Time

Theoretical physicist Nima Arkani-Hamed:

"…many, many separate arguments, all very strong individually, suggest that the very notion of space-time is not a fundamental one. Space-time is doomed. There is no such thing as space-time, fundamentally in the actual, underlying description of the laws of physics. That's very startling, because for what physics is supposed to be about is describing things as they happen in space and time. So if there is no space-time, it's not clear what physics is about. That's why this is a hard problem. That's a serious comment…"

Beyond Subject-Object Dualism

- Niels Bohr: “In our description of nature the purpose is not to disclose the real essence of the phenomena but only to track down, as far as it is possible, relations between ... aspects of our experience.”

- Erwin Schrödinger: “One can only help oneself through something like the following emergency decree: Quantum mechanics forbids statements about what really exists—statements about the object. Its statements deal only with the object-subject relation.”

Returning the Mind to Nature

- Hans Christian von Baeyer: "While the experimenter, the observer, and the theorist are investigating *something* external to themselves, what they are dealing with directly is not nature itself but nature reflected in human experiences."

- Christopher Fuchs: "…it's not that the world is built up from stuff on 'the outside' as the Greeks would have had it. Nor is it built up from stuff on 'the inside' as the idealists, like George Berkeley and Eddington, would have it. Rather, the stuff of the world is in the character of what each of us encounters every living moment—stuff that is neither inside nor outside, but prior to the very notion of a cut between the two at all."

The Observer in Quantum Physics

Christopher Fuchs:

- "Qbism… treats the wave function as a description of a single observer's subjective knowledge. It resolves all of the quantum paradoxes, but at the not insignificant cost of anything we might call 'reality.' Then again, maybe that's what quantum mechanics has been trying to tell us all along — that a single objective reality is an illusion."

- "Schrödinger thought that the Greeks had a kind of hold over us—they saw that the only way to make progress in thinking about the world was to talk about it without the "knowing subject" in it. QBism goes against that strain by saying that quantum mechanics is not about how the world is without us; instead it's precisely about us in the world. The subject matter of the theory is not the world or us but us-within-the-world, the interface between the two."

The Perennial Wheel of Becoming