

achieved by the unique capacities of the human brain. So thank you.

APPLAUSE

MARK SIDERITS

00:54.42

Thank you, thank you. Ok, our next respondent is Evan Thompson, who is a professor of philosophy at the University of Toronto. He works in cog-sci, but also philosophy of mind and phenomenology.

EVAN THOMPSON

00:55.01

Ah yeah, no I think it is. Yeah. Well, I'd like to start off by saying it's a great pleasure to be here. It's a very rich and stimulating event and it's a privilege to be able to take part in it. I also am going to read my remarks because I wrote them as a commentary on Bill's essay so that they could then be posted on the Web site for this meeting. So, you'll have to bear with me as I present it in that way.

00:55.31

Bill's target essay is rich with many ideas and thought-provoking connections between Buddhist thought and Western science and philosophy. I'd like to follow his lead and pursue further some of these points of connection. Let me begin with the concept of circular causality, which plays a central role in Bill's essay as a bridge from Western thought to the ancient Buddhist notion of dependent arising.

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If you've had a chance to look at the essay, you'll see that Bill uses the writings of Gregory Bateson to introduce circular causality. Bateson's work belongs to the cybernetic era, going back to the '40s and '50s and I think we now have a more developed understanding of circular causality, particularly in dynamical systems theory. So I want to say a little bit about that.

00:56.21 So the key here is the notion of emergence through self-organization. Now, right away I want to say that this word self shows up in- No, it's ok because I don't have an image up yet. This word self shows up here in an interesting way. I said emergence through self-organization. This idea actually goes back to Kant.

00:56.46 In his critique of teleological judgment, Kant said that the organism, the living being, is a self-organizing being. And in fact, I think Kant was the first to use this term, self-organization. Kant said that the organism is a self-organizing being because its parts reciprocally produce each other and depend on their relation to the whole.

00:57.08 But he also thought that self-organization couldn't be understood naturalistically. Because he couldn't see how to fit it into a mechanistic, causal framework. To put this point in contemporary terms, Kant thought there was an

explanatory gap between physical nature and living self-organization.

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Today, however, we no longer think there is this gap precisely because of advances in biology and complex systems theory. In particular, the theory of autopoiesis, or a molecular self-organization, self-production, which Bill also mentions in his essay, resolves Kant's problem by showing how recursive and reciprocal relations of production between molecules suffice to generate a minimal biological individual or cell.

00:58.00

And this is a schematic illustration of this idea of autopoiesis, where the basic idea is you have a kind of closed loop of molecular self-production with a metabolic reaction network that produces various components that, among other things, make up a semi-permeable membrane that houses that very network, that in turn produces the components that make the membrane and so on.

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Now, what's especially notable here is that self-organization turns out not to involve any self in the sense of an inner agent calling the shots. On the contrary, self-organization means precisely spontaneous pattern formation in which the system organizes itself, but without there being any self doing the organizing.

00:58.52

Now, I want to link these ideas to the notion of emergence. I said emergence through self-organization, so that was a little bit about self-organization, now what about emergence? Which has already come up this morning. Well, here's a simple three step way to define the notion of emergence.

00:59.09

A process is emergent when, first of all, it belongs to an ensemble or network of elements. These could be molecules or neurons or ants in an ant colony, human beings in an economy or in a society. It doesn't belong to any single element and it happens spontaneously given both the way

the elements interact locally and the way those interactions are globally constrained and regulated.

00:59.36

So take the cellular autopoiesis case again. It belongs to a heterogeneous ensemble or network of molecular elements. It doesn't belong to any single molecular element. And it happens spontaneously, given an intricate web of globally constrained, local interactions.

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So, emergence through self-organization then, has two sides to it. On the one hand, global processes require certain local interactions. On the other hand, global processes regulate and constrain local interactions, such that they happen in a particular way. It's precisely this local/global entanglement that goes by the name of circular causality.

01:00.26

Ok, so time now for some refinements. The term circular causality is potentially misleading.

More than one kind of causation is involved and local and global don't influence each other in the same way. Local interactions involve what philosophers call episodic triggering causes - roughly, Aristotle's efficient cause - whereas global constraints involve standing structuring causes - roughly, Aristotle's formal cause - and global regulation involves monitoring and control - roughly, Aristotle's final cause.

01:01.07

Notice also that local causes precede local effects. But, global pattern emerges from the local interactions and at the same time constrains and regulates the interacting elements. So there are diachronic and synchronic notions mixed into this idea of circular causality.

01:01.29

Now, the notion of downward causation, which also came up this morning. This is often used to describe this global to local influence, but this term, too, is misleading. Complex systems

causality is not a matter of two levels moving in parallel with one acting upwards and the other downwards. Rather, the whole system moves at once as a result of both the local interactions and the way the system's organization shapes those interactions. The way that there's a certain kind of context embedding.

01:02.00

I think John Searle gets this right when he says - this is a quotation - "The right way to think of this is not so much top-down, but as system causation. The system as a system has causal effects on each element, even though the system is made up of the elements." Now, I think we can go even further. In a densely interconnected dynamical system, such as the brain or the immune system, perhaps, the connectivity and the interrelatedness of the components-

01:02.29

TAPE END

MIND AND REALITY - Day 1

Tape 6 of 8 - Panel on Experience

TAPE START

EVAN THOMPSON

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***** BEGIN NEW MATERIAL *****

00:03.14

-arguably, and this is now more philosophically contentious, arguably generate global patterns that subsume the components, so they are no longer clearly separable. This kind of irreducible relationality is another reason that downward causation is a misnomer. Because the components don't constitute an independent lower level, subject to higher level downward influence.

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On the contrary, in non-aggregative or non-decomposable systems, the distinction between preexisting parts and supervening whole becomes problematic. Instead, part and whole co-emerge and mutually specify each other. We could call this idea dynamic co-emergence.

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And I think it's an open question to what extent brain activity needs to be viewed from this kind of non-decomposable perspective. It's not, you know, the sort of standard way of looking at things, but there are a number of theorists and a number of arguments that can be given to motivate that way of looking at things with regard to neurodynamics, in particular.

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Now, dynamic co-emergence seems close to the Buddhist idea of dependent origination. Especially to the way this idea is understood in the Prasangika-Madhyamika tradition, where it means the dependence of phenomena on causes and conditions, the mutual dependence between parts

and whole and the dependence of phenomena on conceptual imputation.

00:04.41 Because, after all, local, global, part, whole - these are context dependent and interest relative terms. Alright. So that's a little bit about emergence through self-organization. Now, the theme of our panel is experience, and so I want to now shift to consciousness. What does this have to do with experience and consciousness?

00:05.06 Well, at the moment, there's an explanatory gap between our scientific understanding of the brain and body and consciousness. And already this morning, Ned Block gave a very nice account of this explanatory gap. So, our position with respect to consciousness is rather like Kant's with respect to life.

00:05.26 The outstanding question is what would it take to bridge the gap for consciousness or whether the gap is in some sense unbridgeable. Now, I think

the best approach - maybe best is a little strong
- I think a very important approach to take to
this question right now is methodological. We
need to enrich our resources on both sides of the
gap.

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The brain-body environment side and the
subjective experience side. While using each side
to inform the other. And this is precisely the
approach that neurophenomenology takes and Owen
mentioned neurophenomenology this morning - a
term introduced by Francisco Varela.

00:06.05

So, let's start on the brain-body environment
side. From the perspective of neurodynamics, each
moment or each moment of transitive or object
directed experience - consciousness of some
object or content - seems to involve the
spontaneous emergence of a large scale pattern of
dynamic neural activity.

00:06.28 Now this is being mapped in various ways. This activity pattern both arises from local neural activities and globally constrains and regulates those activities. And this can be seen quite concretely in the brain when we look at how ongoing endogenous activity, arising within the brain, shapes the way stimulation is received and incorporated into the existing dynamics.

00:06.53 The dynamics is always ongoing and in a sense, the organism meets the environment on the terms of its own ongoing dynamics. So the sort of stimulus-response, stimulus-processing response is true in a way, but it's also misleading with respect to this endogenous complexity.

00:07.09 If we just stay at this level, however, our view will be too disembodied. We need to remember that the brain is in a body in the world. In more concrete terms, brain activity is embedded in at least three wider contexts. First, life regulation processes of the entire organism - all

of the homeodynamic activity going on, keeping the organism up and running.

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Secondly, motivated sensory motor interaction with the world, which is particularly evident in the examples of emotion we were just hearing about. And then thirdly, in our case and presumably many other animals, social and inter-subjective interactions. Now it seems to me entirely possible that the biological processes crucial for various aspects of consciousness may cut across these brain-body world contexts.

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And so it may be misleading to say consciousness is simply in the brain. That's a statement that is in a way very intuitively plausible. You know, digestion is in the stomach. It's tempting to say consciousness is in the brain, but when we embed the brain in the body in the environment, then our story has to become more complicated, I think.

00:08.26 Ok, so let's turn to the subjective experience side. Here, a more radical step is required. We need to introduce a distinct phenomenological level of investigation and analysis. Now, by phenomenology, I mean rigorously describing the phenomenal structure of experience as it is lived in the first person.

00:08.49 In Western philosophy, this project has been most extensively pursued in the phenomenological movement originated by Husserl. In Asia, phenomenological investigation and analysis animate Buddhist and Hindu philosophy. Common to these diverse Western and Asian traditions is the recognition that phenomenology is a cognitive skill that requires mental training of attention and meta-awareness using various first person methods.

00:09.16 In Husserlian phenomenology, although these first person methods are certainly in play, they remain largely implicit. They're not really explicitly

theorized. Whereas in Buddhism and Hinduism and also, for that matter, Taoism, they are explicitly and systematically cultivated. Well, how can the first person methods of phenomenological analysis and contemplative mind training play a role in cognitive science?

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Well, here are three ways. First, they can generate new data that wouldn't exist without using these methods. So, I'm thinking of various kinds of contemplative states, various traits that may be introduced by these states - so this if from a- speaking now from a scientific point of view, a cognitive science point of view. This is new data.

00:10.05

Secondly, they can enable one to reproduce certain mental states reliably and robustly - or potentially enable one to reproduce certain mental states reliably and robustly - thus making the investigation of experience more tractable. So what I mean by this is the idea that

individuals who can generate particular types of mental states and actually stabilize them-

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You know, most of us, you know, our minds are wandering all the time and if you do experiments, you know, you're running trial, trial, trial. Your subject, you know, one moment your subject is, you know, thinking about something. Another time he's, you know, planning what he's gonna make for dinner. Another time he's really paying attention and he presses the button. There's all this variable mental activity which gets averaged over - precisely because it's stuff that you're not interested in - but if you're interested in the fine texture of experience, then you have to pay attention to that moment to moment character of experience. But how?

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Well, individuals who can actually stabilize that in a fine-grained temporal way might make the investigation of various aspects of experience more tractable. Thirdly, first person methods can

provide more refined first-person descriptions of subjective experience. And these descriptions can provide more refined phenomenological taxonomies and guide and inform research on the biological substrates of consciousness.

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So the idea is to develop some phenomenological sophistication that we can use in the context of, say, cognitive neuroscience research on consciousness. Ok, now I want to mention a specific example of an issue that goes to the heart of our concerns here that came up also earlier this morning.

00:11.41

Earlier I said that each transitive or object-directed experience seems to be associated with the formation of a dynamic pattern of large-scale brain activity. But, now it's interesting that phenomenological frameworks as diverse as those of Husserl, Advaita Vedanta and a number of Buddhist schools recognize another type of consciousness.

00:12.03

What we could call an intransitive, in the sense of non-object directed reflexive awareness. This is described as an inner awareness of the sheer openness of the mind that doesn't involve any kind of reflection or introspection. Now, of course these diverse phenomenologists conceptualize this in different ways and that's important.

00:12.26

I won't go into that now. It's interesting to note that Husserl in particular shows how our most fundamental consciousness of the passage of time entails this type of open awareness, this kind of reflexive open awareness that isn't introspective. And he describes how it makes our consciousness self-constituting in time.

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That's his word. Self-constituting is really another way of saying self-organizing. But again, without any homuncular self doing the organizing because the self or ego is an emergent result of

the way that consciousness constitutes itself in time, for Husserl. Ok, so the point I want to make now is that individuals who can generate and sustain a particular kind of contemplative mental state -

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a state in which one's mind reposes, awake and alert in the so-called luminosity of this open reflexive awareness, without attending preferentially to any object or content. Not ignoring, not trying to shut down the object-directed consciousness, but not biasing it in any particular way. Such individuals could provide important information about core aspects of consciousness not readily apparent or accessible to ordinary introspection or reflection and hence, not currently visible to cognitive science.

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Alright, in conclusion then, I want to make three points. First, is that the incorporation of phenomenology into the scientific study of the

mind represents a potentially profound transformation of science. It signals the limits of objectivism - that is the standpoint that tries to ignore or deny the constitutive role of subjectivity and experience in scientific knowledge.

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Because experience is now actually being mobilized within the scientific context. It also allows us to imagine a future mind science incorporating first-person methods of phenomenological analysis and contemplative mental training alongside more familiar experimental and mathematical techniques.

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That's the first point. Second point - the incorporation of scientific knowledge into traditions of contemplative philosophy and phenomenology represents a potentially profound transformation for these traditions. Among other things, it challenges the metaphysical thesis

that the fundamental nature of consciousness is non-physical, or more pointedly, non-biological.

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I'd like to hear more from Buddhists and Hindus who are engaged in this dialogue about how much of their core spiritual and ethical commitments are tied to this non-naturalistic view of consciousness. And this is connecting back to things that Owen raised this morning.

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Now, my third point is a way of putting my own philosophical cards on the table. And here I can really just assert this, not argue it. I think consciousness will always be irreducible in a certain sense. That's not because I think consciousness has non-natural properties, but because I think its condition of possibility for the disclosure of any phenomenon, whatsoever.

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Consciousness, in other words, isn't merely an empirical phenomenon in the world - it's certainly that, but it's not merely that. It's

that by which the world is phenomenally manifest at all. Whether in everyday life or in science.

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Now, to see consciousness this way is to take up a transcendental philosophical perspective. And here I'm using transcendental in the Kantian and Husserlian sense. Consciousness is irreducible because it has an illimitable transcendental status. It's always already presupposed by any stance we adopt towards the world, including science.

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It's- German is wonderful. There's a word in German for this - die unhintergebarkeit - consciousness is the "ungobehindable." Sounds better in German. Now, neurophenomenology acknowledges this transcendental perspective because it follows from its resolute commitment to take experience seriously. And I'll end with that point. Thanks.

APPLAUSE