

Science and Belief

*To follow knowledge like a sinking star,
Beyond the utmost bound of human thought.*

Alfred Lord Tennyson

Is mainstream science incompatible with non-duality? Many spiritual seekers seem to think so. But Francis Lucille says that if you go far enough in scientific investigation, you inevitably end up with non-duality. In September this year, I interviewed Professor Donald Hoffman, a cognitive scientist, as part of 'The End of Seeking' conference, by Pure Presence Conferences. What transpired was a remarkable conversation on truth, scientific models, spiritual pointers, and non-objective consciousness as the source of creativity. Starting from the best scientific models or theories that we have, Donald Hoffman arrives at the conclusion that there is just one consciousness, and that this one consciousness is the ultimate reality of the universe. All divisions of this consciousness that appear to us and can be studied by science, are artificial constructs of mind, but the ultimate reality is beyond mind.

What science brings to the spiritual path is the understanding that all scientific models are untrue. Their value is as pointers to the truth and a starting-point for further exploration. In this paper I've omitted most of the scientific details and detailed logic from our discussion, and focused instead on how applying different models can help us transcend all models to discover the direct experience of our true nature and the nature of the world. Using short extracts from our discussion, the paper illustrates the outward-facing path from exploration of 'it is' to a recognition of the non-dual nature of the universe, paving the way for the glimpse that reveals 'it is' what 'I am'.

I started the discussion by quoting a well-known saying from Advaita Vedanta: *'the world is an illusion; only Brahman (consciousness) is real; Brahman is the world'*. I asked Donald to start by commenting on the first of these three statements:

DH: I've been asking the question 'do we see reality as it is?' We see a world of space and time and physical objects. Do those objects exist even when they're not perceived? Or are they just created in the moment of our perception, and then when we look away, they cease to exist. And so I've been using the tools of evolutionary game theory to ask this question from an evolutionary point of view. ...

You know everybody believes natural selection shapes us to have adaptive perceptions that guide adaptive behaviour. But would it also in addition shape us to see the truth? And what we showed was the mathematics of evolutionary game theory says that ... there's a probability of zero that you were shaped to see the truth. So in some sense it's not a surprise that evolution shapes our sensory systems to guide adaptive behaviour. To see the truth would be an extra step. Evolution doesn't need it, and it doesn't take it.

So at least in current evolutionary theory that's sort of getting at the same thing that you're talking about, Jenny. From the theory of evolution with natural selection, it would agree that our senses give us what I would call a user interface. If you have a desktop computer and you have a file that you're working on that you're editing or writing, and the icon for the file is blue and rectangular in the middle of your screen. it doesn't mean that the file itself is blue and rectangular in the middle of your computer. I mean the whole point of the desktop interface is to hide the truth but it lets you control reality, whatever that might be, without having to get bogged down in the nuts and bolts of it. ... So I think that sort of fits in well with the kind of spiritual insights that you're talking about, where in some sense what we see is not the truth,

but just a useful fiction that guides adaptive behaviour.

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Scientists use many different models depending on the phenomena they are exploring and the scale on which they are operating. But most of us use just one – ‘me’ inside, looking at a multiplicity of objects outside. There’s nothing wrong with this model. It works very well at the human scale for most practical purposes. It is only when we believe it to be true that problems arise – we believe ourselves to be a fragment, limited by the body and the mind. But the ‘interface theory of perception’ described above, suggests that the body and mind are just temporary icons on the desktop. We can’t take our sensory experience as truth. We cannot be an illusory, ephemeral icon.

Of course, that theory, and the theory of evolution by natural selection on which it is based are both just theories. Donald went on to explain how in science, the purpose of all theories is to form a starting-point for developing a better theory. The same applies in spirituality: analogies and metaphors are used to help students see beyond their current understanding to arrive at a deeper understanding. We still use those analogies and metaphors when they are helpful and appropriate, but we don’t believe them:

DH: I don't believe the theory of evolution, but what I do believe about it is that it's a beautiful theory. It's an incredibly beautiful theory and it's the most powerful theory we have in this area. As a scientist it's my duty to study the best *[theory]* that we have. It's not my duty to believe it. In fact, it's my duty to try to find its limitations. I mean if I were a physicist in the 1880's would it be my duty to believe Newtonian physics? Absolutely not. It'd be my duty to appreciate it and understand it and see its implications, and then to try to prove where its limitations are. In fact if you believe the theory, that gets in the way of finding the next theory. You have to wait for some young Einstein to come around and upset the apple cart that had been there for centuries. Why should it take centuries to upset the apple cart? So believing our theories gets in the way. We should respect them and study them, be students of them, and then try to find their limitations and move beyond.

JB: Yes, and that there's actually a parallel in spiritual ideas. If you believe an expression of a spiritual idea to be true, if you believe the expressions of non-duality to be absolute truth, then you're stuck. There's no room for growth, there's no room for deepening of understanding, is there? So I think it applies to both.

DH: I agree, that's a complete parallel between the two. And I agree with you that in both cases the language that we use, the theories that we express in words or in mathematics, are just theories. They're pointers and we should never mistake the words or the theories for the reality. They're merely pointers. The word ‘chocolate’ is only a pointer to an experience. If you've never had chocolate, there's no way that my words could ever lead you into that experience. You have to taste chocolate for yourself. All the word ‘chocolate’ does is point to an experience that I hope you've had and that we all enjoy when we have it. But without that experience, there's nothing in the word ‘chocolate’ that resembles chocolate, that tastes like chocolate, that smells like chocolate, that is the reality. There's nothing in it. They're merely pointers. If you don't know it yourself, the pointers are worthless. I think that's true in science and in spirituality, that the pointers are just pointers. So again we should not be slaves to our pointers or to our scientific theories. We should enjoy where they lead us, and we should look for their limitations.

And I would just say one thing about science and spirituality here. That eventually I see a rapprochement between science and spirituality. What I think is genuinely novel and useful about a scientific theory is its rigor in telling you where it stops. It tells you this theory goes so

far and then it can explain no further. And so that's what we want with our pointers in spirituality. It is one thing for us to know that our pointers aren't the full thing. But if our pointers really say it themselves, the pointers say 'this is where I stop', then that's a real cure for dogmatism. So that's what I'm hoping will happen with the scientific spirituality.

JB: Yes, I hope that too. And in fact your interface theory of perception is interesting for us because it seems to answer the perennial question of truth seekers 'why is there ignorance?, why do we feel ourselves to be a separate limited entity?'. Well, it's because that's what our interface is telling us. It's telling us we are this body-mind. It's hiding the truth. And it's lovely to see a scientific perspective on that.

DH: Yes you're right that this interface theory does say that objects in space time are simply icons that we create when we look, and delete when we don't look. But that icon includes my own body, that includes my own hands, that includes my brains and my neurons. It means that those things don't exist when they're not perceived. That's how striking this is. So right now, I have no neurons. If you looked inside my head you would find neurons. ... So neurons are not the source of our behaviour. ...

So you're right. This really gets at the spiritual idea about who we are. I'm not this body. I'm not something created by neurons. I'm something far deeper. So again, science and spirituality can collaborate and cooperate and use the wonderful tools of the scientific method and the wonderful insights that spiritual visionaries have had over thousands of years, and work together to again move past our current theories. To accept that we love the pointers that we have, but not be addicted or attached to our pointers. Let's move on and get new pointers.

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After a discussion on the nature of mind and how different body-minds agree on the icons they see on their desktops – the intersubjective agreement, we went on to discuss the experience of consciousness in the absence of objects:

JB: Most of the non-dual teachings talk about the need to go beyond the mind. It's sometimes called 'consciousness without objects' or 'nirvikalpa samadhi'. I know that you also meditate, so what do you think is going on there in terms of your theory of conscious realism?

DH: In the mathematical model of consciousness that I my colleagues and have been working on – Chetan Prakash, Manish Singh, Robert Prentner and others – the mathematics makes a very clear distinction between the content and the pure awareness without content. So that comes out in the mathematics itself. We see 'ah so here's the mathematics that corresponds to the pure awareness, and here's the awareness with content'. And so once again we have a good pointer. It doesn't mean that the math is the territory. I'm not saying the math is the truth, but it gives a nice pointer to the very kind of distinction that you're making, with a linguistic description of it as well.

And so in some sense you could also think about it this way; that the content is what I was calling the user interface. So these are the icons that play on the screen, but then they disappear. But the screen is what they play on, and that's that corresponds to this pure awareness without content. So when I say I'm not my body, I'm not the neurons, I am the awareness that sometimes sees an image of itself in terms of bodies or neurons. But then when I don't need that, then I delete them. So in computer science terms we call it garbage-collecting. We use those icons when we need them, they're wonderful data structures, and then we garbage collect them. We throw them away. So yes, when I need to see myself in terms of

neurons, then I see myself in terms of neurons. But that's not the truth. That's just a useful data structure for certain activities and then we throw it away. Perhaps another way of thinking about it is consciousness has infinite potential. It is the infinite variety of possibilities and so is exploring human forms in a three-dimensional space and one dimension of time. It's just one of countless interfaces that consciousness can use to explore its possibilities.

JB: Right. And actually, it seems to me that creativity comes from that awareness without content – those amazing ideas that you've had, your mathematicians have had. Is that something you would agree with?

DH: Well absolutely. And this has to do with something that I know you're well aware of, Gödel's incompleteness theorem, where Gödel shows that any formal system that is rich enough to do arithmetic, if it's consistent, then it must be incomplete. That means that there are truths that are actually true and consistent with that formal system, but cannot be proven within it. And if you add that new truth – say well I'll just add it into my formal system or scientific theory – same thing here, either mathematical formal system or scientific theory – there will always be new truths that can't be proven from your scientific theory or your math. So if you take those truths and add them, then Gödel says well now I'll give you a new truth that's not in your system, that you can't prove. And this goes on forever.

So what this means to me, is that there's this unbounded intelligence. Any scientific theory or any thought that we have about it, is bounded. Well given productivity, in principle, given a set of axioms you can come up with an infinite number of conclusions. And yet that infinite number of conclusions is trivial compared to the ones that you can't reach. So there's still this unbounded intelligence that goes beyond any thinking that we can do and yet ...

So my attitude about it is that we are – you and I are – that unbounded intelligence. And when we do science or when we talk, we are taking that infinite intelligence – or at least unbounded and probably infinite intelligence – and using it in some sense to project that infinity into a small formal system. And that gives us a way to look at ourselves from that perspective. So it's an infinite unbounded consciousness saying 'well let me look at myself from this perspective'. So looking at myself from space and time, or this mathematical structure, or the theory of evolution. Well it's a really interesting way of looking at myself: it's not the truth but it's an interesting perspective on things.

So as a scientist I actually then choose when I want to have creative work. I choose to let go of all of my ideas. I choose to let go of all my thoughts and to go into silence, and to invite a deeper intelligence to come up with new stuff. And I find that to be a very, very powerful way to do practical science. So of course, I do the careful thinking and study of the math. There's a place for really careful reasoning. But then there's also a very, very important place for letting go of all reason and going into a space of pure interior silence, and that's where the true genius is.

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After a discussion on the non-existence of space-time, we returned to the saying from Advaita with which I started the conversation:

JB: So getting back to what I quoted at the start: 'only consciousness is real, consciousness is the world', can you tell us about your theory of conscious agents?

DH: Yes, the first thing I'll tell you is that as a good scientist, I want to make a precise theory but I don't believe my theory. So the theory of conscious agents says let's get a theory in which consciousness is fundamental – not space and time, not physical objects. And let's make it

mathematically precise. And then what we have to do as a scientist, is to show how space and time arise as a projection of the dynamics of consciousness. So the basic ideas that go into our theory of consciousness, we call it a theory of conscious agents. And I should say the word agent is just a technical term. It doesn't mean that there's a self. In fact, there *is* no notion of a self in this theory. The basic ingredients are that there's a mathematical model in which there are conscious experiences. So conscious experiences are taken to be fundamental, like the taste of chocolate, the smell of garlic, and so forth. Those are conscious experiences. They're fundamental. And the idea is that an agent will have a range of conscious experiences, and based on the experiences that that agent has, it can influence the experiences of other conscious agents. At the highest level, those are the only ideas that go into this theory. There are experiences. We call a group of experiences an 'agent', and that group of experiences can affect other groups of experiences that we'll call other agents. ...

It's a theorem of this theory, that whenever you have two agents, their combination is an agent. So if I have a thousand agents, there is another agent which is the combination of all those agents. ... So what I love about this theory is that it's a precise theory of consciousness. It says there is one consciousness, and it points to it, and it says 'here's how far you are from getting there, and you will never get there'. And that sounds right to me.

JB: Yes. So conscious agents aren't independent from each other. There is one agent and they're all intimately interconnected.

DH: Yes. That's right. So all the small agents – so this gets at your question – all the individual agents are merely projections. And therefore they're useful fictions of this one agent. ... So what I love about the theory is it tells you itself, its own limitations. It says there is one agent, and it says 'I can never fully describe that one agent, but hey I can describe [*hierarchies of agents*] up to level 5 billion now, next year maybe 10 trillion'. So that's useful, that's really useful, but the unbounded intelligence will always transcend my theory.

JB: Yes. There's a lovely parallel with the spiritual teaching in that you can never understand consciousness with the mind.

DH: Yes, that's right.

JB: One reality, one consciousness.

DH: That's right. You can only know it by being it in silence. And going back and forth between that silence and the math and the science, for me is a wonderful practice. It takes this idea out of theory and puts it into practice. How do I be a good scientist? Well I use maths, I use experiments and then I also use silence. I go back and forth between the two. And that's sort of what consciousness is up to.

JB: And we are One.

DH: That's what this theory absolutely entails, that you and I are simply projections of this one infinite intelligence that we can't know conceptually, but we can know it by being in silence.

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