

## *A Dialogue on Intelligence*

### *Rudy Rucker and Stephen Wolfram*

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Rudy: There's a widespread expectation that some time in the next century people might become able to amplify their intelligence by plugging into some very transparent Web interface with a nice supply of memory and a customized suite of computational agents.

Just to have a number to kick around, suppose that a person's intelligence could be amplified to an IQ of 1000 — whatever that might actually mean. And let's say that these kilo-IQ people are known as kiquies.

How would it feel to be an IQ 1000 person, a kiquie?

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Stephen: I think it's like the difference between doing cellular automata by hand (or with an ENIAC), and using Mathematica. There's a lot more that one can explore, quickly, so one investigates more, sees more connections, and can look more moves ahead.

More things would seem to make sense. One gets to compute more before one loses attention on a particular issue etc. (Somehow that's what seems to distinguish less intelligent people from more intelligent people right now.)

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Rudy: You're comparing a higher IQ to having an ability to carry out a given mental computation for a longer run-time. Another, related factor might be the ability to access more mental memory; analogous to increasing a machine's RAM.

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Stephen: Yes. And now we have to wonder how it would feel if so much more made sense, and became predictable? By carrying out larger mental computations you could see the underling patterns in more things.

I think the kiqqies would be able to tolerate more computational irreducibility. Things that look incomprehensible to us now would be part of some grand scheme that makes sense to the kiqqies. Ordinary people would be like apes wondering why the visiting humans are talking on cellphones at the zoo.

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Rudy: Well, we want to be careful about comparing people to apes! Certainly having serenity has nothing to do with high IQ. Serenity is all about valving down the logical machinations and the memory accesses. And a lot of what people do has to do with wanting to calm down, to relax, to feel happy. I think that sought-after baseline feeling of contentment even for the kiloIQ or megaIQ people.

Yesterday walking down the street at dusk, I was thinking, "What really do hypothetical thousand-times-as-capacious brain-like systems have that I don't have, walking down this street looking at the trees?" They can look at the trees from more angles at once, they can analyze the motions in more depth. Big deal. They're still just looking at the trees. By the same token, I don't have all that much more in my perception of a scene than might a crow.

This said, part of any meditative slack feeling consists being open to inputs from all over the body and from all the senses. And the sensory input might well richer for the kiquie. Even if the number of inputs were the same, the associations coming out of the inputs would be richer. And of course a kiquie could support a larger number of parallel trains of thought, explore extra branches in the thought tree, and, as you say, anticipate things better.

Another aspect of kiquies would the ability fully model the behaviors of some less intelligent people. In an ideal world, this would lead to the kiquies being more compassionate and understanding; in a more realistic world it might well make them more successfully manipulative.

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Stephen: I always like to apply my NKS way of thinking to questions like this.

Note that once people had these very high intelligences, then in terms of human affairs, then, the kinds of things that are viewed as being trivial and not worth doing would greatly expand. But computational irreducibility implies that something is always left. There's always an edge, a zone of intellectual interest.

Pushing past the kiquies to more and more intelligent beings, it seems as if, in the limit, a "superintelligence" would understand everything in the universe. It would connect everything together, a bit like the Borg. But computational irreducibility would still keep the universe interesting. No matter how vast are the computational resources you have, so long as they're finite, there will be future states of affairs that you don't have the computational power to predict.

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Rudy: Moving past human intelligence amplification, I've always though that it

would be interesting to have natural processes like wind, leaves, water, and clouds really be computing like conscious minds. I have this anti-extropian bent; I'd like to see the computers to shrivel away, and to see Nature wake up. I agree with you that most natural complex processes are indeed computationally universal are thus, in principle, capable of acting like minds. The catch is that our brain has this really well-organized memory access system. And I don't see any kind of memory in a cloud or a fluttering leaf.

The leaf doesn't "remember" what it was fluttering yesterday or even ten minutes ago. Even when in a continuous flutter mode, past states are lost to friction and averaging.

What if Earth's system of clouds had long-term memory? Would they begin acting differently over time? Or brooks? I have a long-term memory, as does the human race, and we don't actually change our behavior all that much. I type. My fingers moving around are as patterned-but-unpredictable as the waving of a pennant in the breeze. But close observation reveals that my finger-twitching in 2006 is rather different from what it was in 1986. Certain strings have different frequencies (my vocab has changed).

Looking at a video of a tree branch waving in the wind, you'd be hard put, in our world, to say when the video was made. Not so if you look at a video of a person talking. Or at the genome of a bacterium.

With a memory, history has a direction. Might natural processes acquire a memory and wake up?

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Stephen: Maybe I'll get back to you on that.