

Talk #16: Becoming Trans-human

Even though the machines are not yet inside of our bodies and brains, we . . . routinely do intellectual feats as a society that would be impossible without our machines. As these machines become more and more intimate, they will be in our clothing and ultimately inside our bodies and brains. This will allow us to extend our mental horizons, and we'll be capable of appreciating and absorbing and communicating more of this exponentially expanding knowledge base.

– Ray Kurzweil¹

Guy: So . . . Have you had enough?

Thea: I don't know. It's all very interesting. But to really get my head around this stuff, I'd have to do what you did: go off and spend the next ten years reading around these subjects, to see where I end up. I'm not sure that trading in a mystery for a reading assignment is such a bargain.

Guy: Or, as we do with most things, you could just take on faith that the people who have done that homework are not fools or liars, and are really offering you the best ideas we have of where mind comes from and how it works. If you do just that much, you'll be miles ahead of people who feel entitled to strong opinions on matters of which they are willfully ignorant. Ignorance is no crime today. Given how much there is to know, it's not even a disgrace. A lifetime is barely enough to learn a fraction of what is known in a few areas that really interest you. If I've done no more than convince you that the eD paradigm of self-organization can tell a much better story than Cartesian dualism and Intelligent Design, our time will not have been wasted.

Thea: Oh, you've convinced me that it makes for better science. Whether it makes for a better life, or a better society, I still have doubts.

Guy: Reasonable ones. It's still too soon to know what human societies will do with the idea of self-organization. The first glimmerings of the paradigm have only been around for about 400 years or so, if we take Galileo's clash with the Inquisition as the marker. Scientists only became fully conscious of it within our lifetime.² The lay public is only now awakening to the significance of its clash with previous, top-down modes of explanation and understanding.

Thea: How does Galileo come into it? In one of our early talks,³ I remember you mentioning Adam Smith as a forerunner of the ecoDarwinian paradigm. Galileo lived almost 200 years earlier.

¹ See Kurzweil's book, *The Singularity is Near*.

² The term "self-organizing" was introduced in 1947 by W. Ross Ashby.

³ Talk #2.

self-organizing knowledge

Guy: Galileo has been called “the father of modern astronomy” and the “father of modern physics.” In fact, we can see him as the father of science itself – the first thorough-going practitioner of a method through which public knowledge is allowed to self-organize through the competitive contributions of innumerable individuals, rather than be imposed top-down by traditional authority. The real novelty of science was to license perpetual criticism of authority from a pragmatic and empirical standpoint. The community of science is just the community of people – relatively few people, unfortunately – who have learned to live with doubt.

In that spirit, scientists operate by framing hypotheses that they can test with systematic observations. Of course, the hypotheses they can frame and the tests they can perform at any point in time are limited by the current repertoire of concepts and techniques, so we must imagine that community’s collective knowledge as gradually extending and refining itself (evolving, in other words) as its members attempt to work with their knowledge and apply it. In the scientific literature of any field we can trace “the social construction of reality” in almost complete detail. Another clear example of such bottom-up construction might be Wikipedia, the on-line encyclopedia that anyone can edit.

Thea: So you could say that the ecoDarwinian revolution began with the rise of science itself.

Guy: That’s what I would say: Dynamic change was already going strong in the 17th century, but the rise of science, and the epoch of “Enlightenment” that followed, effectively valorized change and locked us into it as an addiction. Previous generations had preferred stability to change – as many people still do – people around the world, whose experience has been that change is nearly always bad for them. Historically, the idea of evolution and the notion of “progress” have been one and the same.

So if you ask what the idea of self-organization is doing, or will do to human societies, you should count science and the modern world among its achievements.

Thea: That’s quite a claim!

Guy: I make it advisedly. John Locke, Adam Smith, Jefferson, Diderot and his Encyclopedists – they were all children of the Enlightenment, which was itself a child of the self-organizing process that we call science. The world they preached – its democratic politics, capitalist economics, its science and its technology – is based on this root idea that knowledge, wealth and social order need not be planned and authorized by a ruler (whether human or divine), but that they can evolve by themselves, and have in fact done so. Smith explained how this was the case in economics. Darwin showed how it could be true of Life. In the last thirty years or so, as I’ve been describing, we’ve begun to understand how it is true of Mind.

Thea: So when I ask about the impact of your eD paradigm on society, there is the whole of modernity to consider. The Enlightenment, liberal democracy, market economies and everything that followed reflect the application of scientific Reason to social issues. Both theoretically and pragmatically, these were now to be treated with a focus on concrete results – in a scientific spirit at least, if not yet actually by science.

Guy: Yes, and we can go further: On the level of values and morals, it has been apparent for some time now that a key feature of the bottom-up paradigm is to set a value on difference as evolution's raw material. This point was apparent to Nietzsche, who drew his ethic of heroism and bold exploration from his reading of Darwin. Although his reading (like that of the social Darwinists) was largely a mis-reading, it remains true that Darwinism makes room for, and finds creative use for individual traits and idiosyncrasies that traditional philosophies would regard as failings and perversions. Plato and Aristotle believed that all things existed as ideal types – or ideas in the mind of God, according to the Jewish and Christian thinkers – before they appeared in the material world as more or less accurate instances or realizations of the ideal. We post-Darwinians now see these individual differences as more or less viable experiments – a “dance on the edge of the possible,” as Stuart Kauffman put it – with no pre-existing ideals anywhere.

Thea: While for traditionalists, anything that departs from what they see as the ideal is just plain wrong. As with sex: What one person enjoys as excitingly kinky, another condemns as an unnatural act.

Guy: Precisely. And with all the culture wars that follow.

Thea: So where is it going now – all these new ideas, new knowledge and new technology? Where is the world going with them?

Guy: That's an impossible question. The only honest answer I could give you is that we won't know until we get there. There's just no way to know which ideas will stand up, and which technologies pay off. There's no knowing how the competition of ideas and technical possibilities will play out.

Thea: But surely you've thought about these things – have some opinions about them.

Guy: Of course I have. But none that could do you or anyone any good. I believe, as you do, that our civilization is racing toward a crisis – a singularity, as it has been called – that promises to transform human life beyond recognition, while it is already causing a crisis for our planet's ecosystem. The ideas I've been describing are wrapped up with these trends, but the more I read and think, the less idea I have of what should be done.

In fact, I doubt there's much we can do, beyond trying to understand the situation we are in, and doing our best with events and issues as they arise. People clamor for regulation of the new technologies, but I'm

afraid they're whistling in the dark. Governments have been fairly good at setting standards that industry itself has wanted in place, but have generally failed to regulate business corporations against their wishes, for a public interest however obvious. I'm afraid our governments will prove no more effective at regulating the new technologies than King Canute at regulating the tide. By all means, debate and legislate, if that is your thing. But the waters keep rising anyhow.

Thea: I wish I could disagree, but nothing of my experience in government encourages me to do so. The regulators mostly had common interests with the regulated, and always depended on them for information. And we were always playing catch-up – always a step behind – trying to regulate processes already on stream, and products already on the market.

Let me pull you back a little. You said something about “racing toward a singularity.” That sounded ominous. What's a singularity?

toward the singularity

Guy: In math, it's the point where a curve spikes – where its rate of change becomes infinite. Ray Kurzweil applied this concept to technology, arguing that it has accelerated exponentially over the course of human history. Sometime around the middle of the 21st century, he claims, it will become so rapid that the continuity of history will be ruptured. At that point, humanity as we have known it will come to an end, and a trans-human era will begin.

Thea: And you agree with this?

Guy: I do and I don't. I think Kurzweil is undoubtedly right that measurable technical parameters like chip speed, or the cost of sending a message from New York to Beijing are changing exponentially – up to limits of feasibility and/or diminishing returns, in some cases. And I think he is right that the continuity of history is threatened. But I think that he and other trans-humanists underestimate the sheer durability of the human condition, and the resistance that all these cognitive and technological changes are provoking. I think it likely that greed, lust for power, fear and sheer habit will foreclose the future they dream of.

Thea: That would not be a singularity in history. That would be business as usual.

Guy: Well, mathematical singularity might still be an apt metaphor for our predicament. Not that the behaviors involved are odd, but that the rate of change is becoming infinite.

It's important to grasp that the new technologies really are new – doing things that were never done before, and reshaping our ideas on what it means to be human. The changes wrought by gunpowder, the printing press, the steam engine, telegraph and telephone, electric lighting, cars and airplanes, radio and television, modern medicine, and even the early digital computers were quantitative changes, for the most

part. They did faster, cheaper and more effectively the same things that people had always done. Their collective impact made a huge difference in the ways that people lived and earned their livings, but did not change our thinking much.

In that sense, the first real novelty – cognitive novelty – was flight, followed by rockets and spaceflight. Man had long dreamed of soaring through the skies; now we can actually do it. The famous photo of an Earth-rise seen from the surface of the moon, gave us our first external, truly global view of the small planet that remains our only home. Digital imaging and the Internet between them are changing our relationship to information and knowledge much more than printing ever did. Bio-technology will take the randomness (or the hand of God, if you prefer) out of reproduction, making it possible for parents to design their children to specification. Remote-control weapons will take personal risk out of the warrior's trade, making it possible to kill people in the same adrenaline-rushed but fearless mood in which kids now play video games. At the same time, new medical technology will blur the distinction between man and machine. On one hand, it will put all sorts of prosthetic gadgetry (from hip replacements to ultra-miniaturized computing and communications devices) into human bodies, directly linking with the appropriate body tissue – bones, organs, arteries, veins and nerve fibres. On the other, technology is already treating human individuals as expensive system components that perform, with carefully circumscribed autonomy, all tasks (and only those) that cannot economically be automated. Or as refractory units that smart information systems will supervise and manage – for our own good.

It may even be possible for medical technology to postpone or reverse the aging process: People would no longer die natural deaths but, sooner or later, either have a fatal accident, or have themselves tidily put away, out of sheer boredom. Alternatively, they might have their memories and personalities uploaded to very powerful devices (probably more like synthetic neural nets than like our present-day computers) to dwell eternally in cyber-space. Both possibilities are being studied today, and serious money is invested in them.

Thea: Where do governments stand on these matters?

Guy: Government attitudes are mixed, as you might expect. Apart from various military and economic possibilities that they don't want to fall behind on, governments have reasonable fears of what could happen when parents choose options for their children as they do for their automobiles. Or when it has to pay pensions and provide medical care and facilities for any large number of people over 65, who expect to reach 120.

About the dire economic and political consequences of any general increase in people's intelligence, the less said the better. I leave these to your imagination. But finally, just consider the scope for political conflict between those who have access to these new technologies and those who, for any reason, do not. Or between those who do and do not accept their moral legitimacy.

Thea: Let me change the subject, a little. I don't see the role of your eD paradigm in all this. Except indirectly, insofar as these developments are fruits of scientific method. Is there a more direct connection?

Guy: The eD Paradigm and specific ideas that we've been discussing are crucial for more than a few of the novel technologies. For example:

- Principles of self-organization are being applied directly in the manufacture of nano-tech devices in ways that I don't begin to understand.⁴
- Computer programmers are writing what they call genetic algorithms to solve optimization problems by evolving toward an answer.
- Modern communication networks are open systems that must be used without fore-knowledge of load distribution and without central control. Thus, the World Wide Web in general, and Wiki sites in particular, are themselves partly self-organizing systems that appeal to principles of self-organization in their design. Google (which otherwise knows only the keyword you enter) uses swarm logic to prioritize the returns from your search requests.
- Engineers now try to design their gadgets to be "user-friendly" – that is, to guide a user in their correct use. They don't refer to this guidance as "stigmergy," but that is the idea.
- Synthetic organs and organ transplants – a key dimension of the anti-aging program – depend on a deep understanding of the body's immune system, with its tendency to hunt down and destroy alien tissue. Cures for AIDS and very likely for cancer will also depend on this understanding. But these immune systems are not, and could not be pre-programmed by evolution. Rather they self-organize over time to recognize and combat specific invaders that they encounter. Our existing vaccine technology is based on the considerable understanding of this process that we have gained to-date; but there is much that we still don't know, and communicable diseases that we can't prevent, sometimes because they are themselves evolving too rapidly.
- When personal computers and cell phones get small and light enough to be inserted into our bodies and wired directly to brains, a detailed understanding of the self-organizing patterns in both biological and artificial neural networks will be needed.
- The defeat of natural aging, if it is possible, will depend on a detailed understanding of the human body as an evolving eco-system – strongly influenced, but not pre-programmed in complete detail by its genes.

One could go on and on. You can see why Kurzweil regards this technological explosion as a discontinuity in history. It's like a "black hole" in space – a mass so great that nothing, not even light, escapes it. Everything gets sucked in, and we have no idea what (if anything) comes out the other side.

⁴ See the Wikipedia article on nanotechnology at <http://en.wikipedia.org/wiki/Nanotechnology>.

Thea: And you believe the crisis is inescapable?

Guy: Apart from the eD paradigm's direct contribution, I believe that Kurzweil's singularity was already implicit in science, in Adam Smith's economic liberalism, in the American Constitution, and in the human desire for "progress." The religious types who hate this "brave new world" have no viable alternative to offer, but they are not crazy. They see correctly that modernity itself is their enemy. What they fail to see is that a medieval society armed with modern weapons can start a global war, but will not be able to govern anything – even itself.

At root, the culture wars we see today are only so many theaters in the much bigger war between people who believe (albeit, perhaps, with large reservations) in science and technology as sources of progress, and those who feel cheated, humiliated, marginalized and oppressed by technology – often with very good reason. A very nasty saying about our hi-tech world captures the issue nicely: "Once a new technology rolls over you, if you're not part of the steamroller, you're part of the road."⁵

Largely, these two groups – road and steamroller – are talking past each other, unable to understand or care what the other side is saying. And part of the reason for this polarization and mutual incomprehension is that the sides are operating from very different paradigms.

Thea: So you see the bottom-up boys as the party of progress, with the top-down types as a fundamentalist resistance?

Guy: It's not that clear cut. Remember what we said a while back about the complexity of social cause. I don't say that the world's poor are poor because they reject the ecoDarwinian paradigm. Nor would I say the contrary: that they reject the ecoDarwinian paradigm because they are failing to compete. Both statements would be silly. On the other hand, it's obvious that ideas of Reason, science and technology, market economy, liberal democracy and biological evolution have clustered together from the mid 16th century to the present. While conversely and unsurprisingly, most resistance to this "Enlightenment" program has clung to some version of the top-down world-view.

It is probably more than coincidence that the Tao-based civilizations of the Far East which, of course, had powerful ancient regimes of their own have been adapting fairly successfully to the modern world, while the Solar, monotheistic civilizations of the Middle East (which laid the very foundations of Western science) are conspicuously failing to do so, and blaming everything but their top-down, it-is-the-will-of-Allah world view for their difficulties.

Thea: Jews and Christians are also monotheists.

Guy: In theory yes, but few Jews and Christians really believe the old stories any more, though they pretend they do when the requirements are not too onerous or inconvenient. These days, most of them "believe in belief," as

⁵ Attributed to Stewart Brand of MIT's Media Lab.

Dennett puts it, more than they do in the commandments and providence of their God or in the strictures of their church. Muslims seem really to believe that Allah has a plan for the world revealed to his messenger Mohamed – and that obedience to that message is demanded, ultimately from everyone. Inconveniently, many Muslims seem ready to die rather than compromise on this point.

Thea: I wonder if there is anything really new here. Hasn't there always been this same division of humanity into "steamroller" and "road"? On one hand, aggressive, can-do entrepreneurial types who jump (by a kind of swarm effect) onto the latest band-wagon and ride along with it, cheering it on and making it happen. And, underneath them, a peasantry too pre-occupied and exhausted from their daily struggle to lift their heads up for more than a moment, before the juggernaut pushes them back into the mud.

beyond human?

Guy: Perhaps the only thing new is that the future evolution of our species may now become more a matter of culture than of biology. Some futurists claim that humans soon will consciously direct the evolution of the species, as we already do with our crops and livestock. That's what the word "trans-human" implies. But here, I think, they are far too optimistic about the foresight and regulatory effectiveness of either governments or the market. The law of unintended consequences is still alive and well – in fact, more so than ever as the systems we build get bigger and more powerful.

What I think we may be seeing is a splitting of humanity – more than six and a half billion of us and rising – into two populations: One characterized by high education, income and access to the new technologies – but with a low and managed fertility rate. The other, just the reverse. In any case, the stakes seem higher than ever before. The trans-humanists⁶ think of themselves as battling for a Utopian future in which the biological limitations of humankind are overcome, and its ancient enemies of poverty, sickness, aging and death are permanently defeated. The traditionalists see themselves as fighting a heroic rear-guard action to preserve ancient human values – human dignity as they understand it, and the fidelity of humankind to the commandments of God Himself.

Thea: You make it sound like Armageddon – though not so much a war of Good against Evil, as between utterly opposing visions of the good. But I don't think it has come to that, and I doubt it ever will. Things are just not that clear cut, and the whole notion of culture war is probably misleading. Most people seem to have a foot in both camps. Even if they find themselves taking an active part on one side or the other.

⁶ See the World Transhumanist Association web site at www.transhumanism.org/index.php/WTA/index/.

Guy: I've been drawing the distinction much too sharply, to make clear what the issues are. You're right to call me for doing so. In North America, at least, if it's a culture war, it's still more like an internecine, civil war in which families and individuals themselves are often divided against themselves. On the intellectual level, there are clear and valid concerns on both sides; and though I'm mostly with the futurists, I see merit in many arguments from the opposition. For one thing, the label trans-humanist makes me wince. With the most rabid fundamentalists, I must agree that the redemption of humankind – and of evolution itself – is not to be accomplished with a pill, or any other technological fix.

Thea: Redemption!! What a strange word, coming from you. Do you actually mean something by it? From an ecoDarwinian gnostic, what could it possibly mean?

Guy: I mean something. No evolutionist would deny the amoral cruelty of the Darwinian process. From any human perspective, there is no doubt that Nature's garden is savage, extravagant and mindless in the extreme. But in humankind, evolution has somehow produced a creature who can call this blind process to a reckoning – who can wonder if the garden's beauty is worth the pain from which it derives, on which it's based. As I used the word, "redemption" would mean a judgment in the affirmative: a sober judgment that one's life has indeed been worth the pain of living it, and the pain of other lives that made it possible. Obviously, to have validity, such a judgment must be autonomous and authentic; and we've discussed what those words mean now. The redemption we must seek is not a matter of reconciliation with an external, law-giving God, but with each other and with ourselves.

People remember their histories. In some places especially, the suggestive pull of history is overwhelming. I think this question of redemption – a quest to avenge the past, or at least be worthy of it, is now front and center in global politics.