

Evolution and the Transcendence of Mind - Theodore Roszak - The Galileo Commission

Where is evolution going?

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Where is evolution going? For most biologists, the answer is: everywhere and nowhere. Standard Darwinian theory under-stands evolution to be a free-for-all, governed by random combinations of DNA and lucky environmental selection. Living things evolve in all directions, opportunistically occupying any niche for which their genetic roulette prepares them. 'Survival of the fittest' means the survival of those that 'fit' the shifting ecological contours of their habitat. The process is ceaseless, shapeless, mindless.

Evolution and the Enlightenment

Darwin, we must recall, created his theory of natural selection during the high noon of dog eat dog capitalism. Malthus and the Manchester School were never far from his thoughts. The prestige of classical economics has long since faded; but evolutionary biology remains linked to the image of ordered randomness once seen in the competitive free market. Natural selection is the biological version of Adam Smith's 'invisible hand'. In both cases we have dynamism without design, vitality that describes no vector. Both ideas claim to be value-free, but they are far from being philosophically neutral. Classical economics was invented to chase government from the marketplace; similarly, Darwinism was quickly seized upon to drive God from the state of nature. The universe ran by itself; no central planning agency was needed. But such biological laissez faire has always been troubling to those who see the history of life on Earth as an adventure rather than a succession of accidents. The uncertainty set in early. Alfred Russel Wallace, co-founder of natural selection,

was among the first dissenters. He agreed that natural selection explains adaptation; but in his eyes adaptation was essentially conservative and unenterprising. It moves in a purely horizontal direction, moulding plants and animals to their environment in ever more specialised and so inflexible way. Overarching natural selection, Wallace saw a more daring, vertical movement which boosts evolution toward higher levels of complexity and consciousness.

The Evolution of the Brain

If evolution were merely a matter of survival by adaptation, we might still be a planet of hearty bacteria. Clearly, something more dramatic and risky has been going on. Life has been building itself up into more delicate, sentient forms. And in the vanguard of this vertical thrust, we find the most remarkable development of all: the human brain, an organ that vastly transcends the competitive advantage we may once have needed to outsmart our primate rivals.

What is the status of art and music in evolution, Wallace asked. Do they

perhaps point toward a destined goal beyond physical survival? Fascinated by the transcendent impulse of the mind, Wallace, in his later years, was drawn to spiritualism and parapsychology as possible keys to human nature.

Standard biology has a conveniently minimising category for the brain's strange excursion into cultural creativity: hypertrophy. Excess – perhaps the sort of excess that often proves fatal, as it may have with the dinosaurs who went to extremes in body-weight. But a name is not an explanation. And there is surely something odd about so dismissive a treatment of the very mind that brought forth evolutionary theory. If we value the quest for truth, as every scientist must, are we to regard the brain that searches for truth as no more than a luxurious surplus of electrochemical circuitry?

Mind in the Cosmos

Following Wallace, countless evolutionary philosophies have pondered the place of mind in nature. All have agreed that it is the frontier of evolution. Admittedly, this is a self-serving view. The whales and the oak trees are in no position to dispute

the role we assign ourselves as the vanguard of life on Earth. We announce that status, but only the silence of our fellow species surrounds us. Yet the claim need not be made arrogantly; nor need it ignore the hazards and responsibilities that befall pioneers. It can, indeed, be a humbling and civilising lesson to see ourselves at the forefront of a grand, cosmic vista that dwarfs the selfish passions and petty distractions of the moment.

But it is one thing to decide that mind is the leading edge of evolution; another to decide what 'mind' most essentially means? Whose mind do we choose as our model? Here is where controversy sets in. Scientists understandably cast human nature in their own intellectual image, preferring the analytical and empirical habits that characterize their professional life (but which may actually have little to do with great paradigmatic breakthroughs like Darwin's own discovery of natural selection). Such an approach to the evolution of intelligence is well illustrated in Carl Sagan's book *The Dragons Of Eden*. For Sagan, intelligence is wholly a matter of

problem-solving and tool-making, practical talents to which natural selection easily applies.

This Robinson Crusoe/Tom Swift* image of mind is good, solid eighteenth century science. John Locke, David Hume, and Benjamin Franklin would have heartily approved. Here is the mind as a rational instrument without shadowed corners or hiding places. It is the mind of Homo faber; closed to dreams and unsettling visions, never in need of psychiatry or spiritual counselling. We are left to wonder how such a mind could ever make itself sick with unbridled fantasy or thwarted desire. In the evolution of efficient intelligence, why would not the burden of neurosis have long since been selected out? We are reminded that Freud, searching for the secret of madness, turned to the Romantic poets for insight, just as C.G. Jung, seeking the archetypal roots of consciousness, turned to myth, religion, and alchemy.

Artificial Intelligence

Not surprisingly, Sagan's study of mind finishes with an enthusiastic chapter on artificial intelligence, obviously the way

ahead for the brain as data-processor.

Conceive of the mind as a computer, and the computer is bound to look like a rather promising mechanical mind - possibly a better one than the human original. It calculates faster, files more data, follows logical rules more accurately, even plays chess better than most. It uses words and numbers with unambiguous precision; it does not sleep, dream, lie, forget, goof off or go crazy. Is it not everything a mind should be?

There are many computer scientists who would agree. If evolution points toward better mental data processing, then the best data processors of the future may not be flesh and blood. It is not only science fiction that now flirts with the possibilities of human obsolescence. Imagine, at the present rate of progress, two or three more centuries of research in artificial intelligence and genetic self-replication. Imagine the two fields of study coalescing into one science. What wonders of transhuman evolution might then be within reach of our technology!

'The amount of intelligence we humans have is arbitrary,' observes computer expert Marvin Minsky of MIT, 'it's just the amount we have at this point in evolution. There are people who think that evolution has stopped, and that there can never be anything smarter than us. Minsky has called the brain a 'meat machine' which, like all machines, can be analysed, adjusted, and improved upon.

In the same vein, Robert Jastrow of NASA believes that 'Human evolution is nearly a finished chapter in the history of life. That does not mean the evolution of intelligence has ended on the Earth. We can expect that a new species will arise out of man, surpassing his achievements as he has surpassed those of his predecessor *Homo erectas*. The new kind of intelligent life is more likely to be made of silicon.'

Jastrow thinks this evolutionary leap to sentient computers may still be a million years off. In the meantime, one can foresee problems along the way. Artificial intelligence is, after all, a technology. Like all technologies, it is somebody's property. That is a significant difference

between computers and human brains. Brains – some brains – can be hired or bribed, but they cannot all be owned; data banks and computer software can and are. They are more and more owned and programmed by governments, corporations, and the military, interlocking super-institutions that use computers in their own interests. In a world of increasing military/industrial concentration, to imply that artificial intelligence is superior to human intelligence – to advertise it as the inevitable next step in evolution – is to deliver the persuasive power of facts and figures into ever fewer hands. As speculative as they may seem, such evolutionary vistas are not politically inconsequential.

There is another danger to which the computer model of mind opens us. It ignores a basic lesson of evolution: over specialisation kills. In an industrial economy, crisp logic and rapid data management are supreme necessities of life. But an urban-industrial society is only one possible human habitat, and perhaps not a long-lived one. The computers themselves may accelerate

the pace of life beyond human tolerance to the point at which confusion, misjudgement, or the slightest lapse of attention are unaffordable. If the arms race were ever to resume, the thermonuclear war machine – the most highly computerised system yet developed – would soon reach that degree of inhuman exactitude.

To narrow our criterion of mind to fit the needs of the industrial style of life, to make our selves wholly dependent on the computer technology that that style demands, may be a prescription for extinction. Even in strict Darwinian terms, variety is the secret of adaptability; it is also what makes life interesting.

Boundless Mind

Fortunately, outside the small, busy world of the Artificial Intelligentsia, philosophers of evolution have celebrated many other dimensions of mind. Nietzsche and George Bernard Shaw envisaged the evolutionary Superman as artist and philosopher. Teilhard de Chardin believed it is the saints who will usher us to the culmination of human development. The

systems theorist Erich Jantsch (in his book *Design for Evolution*) regards love and the 'feminine element' as the rejuvenating force of human evolution. Henri Bergson placed mystic intuition at the forward edge of the *elan vital*. He argued that the task of the mystic (whom he saw as an emergent new species) is to humanise technology so that it might liberate us from material necessity for a higher, religious calling. 'Man will rise above earthly things only if powerful equipment supplies him with the requisite fulcrum. He must use matter as a support if he wants to get away from matter. In other words, the mystical summons up the mechanical.'

To emphasise, as these philosophers do, the evolutionary role of the compassionate, the creative, the mystical is a useful corrective to the current fascination with computerised intelligence. It reminds us that, where the means of mass destruction have reached so awesome a level, our survival depends more on the saints who set humane goals than on the technicians who provide ingenious means. Norbert Wiener, the founding father of cyber-

netics, knew as much; he warned us that 'know what' comes before 'know how'.

The mind is bigger than logic and mathematics; bigger than any machine it invents. But it is just as important to realize that the mind is bigger than art and religion as well. It is bigger than anything we can stand away from and view critically as an option – which is, quite simply, every element of human culture. Indeed, the mind is so big that we cannot see its boundaries any more than we can see the edge of the universe. Whatever we say about it (including what I say here) becomes one more idea within it capable of being debated and negated.

Nothing so characterises the mind as its inherent elusiveness. It cannot encompass itself. That paradox is an evolutionary one. It is grounded in the fact that, at a certain point, evolution reaches a reflexive state which generates the idea of evolution. Whatever 'direction' means in evolution, it has something to do with evolution's capacity for self-envelopment through consciousness.

Over the past two generations, evolution has become the most comprehensive scientific concept since Newton's laws of motion. Beyond living things, it is now invoked to explain the creation of matter out of the Big Bang, the spontaneous organisation of pre-biotic molecules, the development of stars and galaxies. The human mind, which alone reaches out to grasp the cosmic process from which it has emerged, clearly holds a special, frontier position in evolution. But it is not any one focus or fascination of the mind that points the way forward; it is the whole mind (or as much of it as any of us can experience) exercised in a condition of graceful integration.

There are certain forms of mysticism, like Zen Buddhism, with its open, non-discriminating style of meditation, that bring us close to appreciating the expansiveness of the mind. The impish humour of Zen stems from the ability of the mind to stymie itself with paradox and become larger by the act. But it may not be beyond computer science to find the same wise delight in the mind's often comic effort to capture itself. In mathematics, Godel's theorem of

incompleteness states that the axioms of any formal system cannot be wholly proved from within the system itself. Thus, no logical system can ever come full circle and bite its own tail. There will always be a gap that has to be filled from outside.

Computer scientists differ in their evaluation of Godel's theorem. One interpretation by Professor Hao Wang holds that '...the human mind is incapable of formulating (or mechanising) all its mathematical intuitions. If it has succeeded in formulating some of them, this very fact yields new intuitive knowledge'. This seems to me as a non-mathematician to be a stiffly logical way of describing the mind as the Zen masters did: 'a sword that cuts but cannot cut itself, an eye that sees but cannot see itself'

Perhaps, then, with a bit of humility and a sense of humour, computer science can help us learn something about the mind's radically transcendent nature. After all, it is the human mind that invents artificial ones (as much for the fun as for the utility of it) and then has

room left over to defy the logic or grow bored with their predictable correctness. That 'room' is the evolutionary margin of life still waiting to be explored. What computers can do represents so many routinised mental functions we can now delegate and slough off as we move forward to new ground. The machines are behind us, not ahead.

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