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HUMAN BEING AS AN EVOLUTION OF EVOLUTION  
TALK GIVEN IN BRIAN SWIMME'S EPIC OF EVOLUTION CLASS  
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- I. Paul Hawken is presenting us a clear and terrifying picture of what we, through our business practices, are doing to our habitat. Hawken, and other writers in this tradition, speak as if corporations are destroying the natural world.
- II. Now I think it is clear that we are making an unlivable mess out of our environment, but I get uncomfortable when I read or hear about human activities as destroying the *natural world*. Aren't we human beings part of the natural world?
- III. We have spent the last two and a half quarters studying the Epic of Evolution. We have traced the evolutionary process from the primordial flaring forth, through the evolution of the galaxies, the suns, the complex molecules, the planets, life and, finally, human beings. One of the most fundamental contentions of the evolutionary perspective is that *the human mind did not arrive in the natural world all-of-a-sudden and from outside, but rather evolved within the natural evolutionary process.*
- IV. But at the same time, although human beings and human intelligence must have evolved within nature, the transition to human being brought in something so new and so radical that it is sometimes convenient for us to speak *as if* humans are somehow other than natural, and as if human beings, and the human economy, could destroy the natural world.
- V. The question is: what is it about human beings that so sets us apart?
- VI. I want to suggest that human being is an evolution of the evolutionary process itself.***
- VII. If we look back at the evolution of Life as we now understand that process, we see that some of the most important milestones in that process are speciation events. In a sense, the evolutionary process in Life is the ongoing articulation of new species. Let's take a quick look at the process of speciation:
  - A. Prior to the human kingdom

1. The functioning of the organism is largely determined by the form of the organism. While individual animals, and even species, do learn, the extent of that learning is quite limited.
  2. Any sufficiently large change in adaptation requires a change of form. Thus any sufficiently large gain in adaptation required a speciation event.
  3. But a speciation event is not a way that a species learns something new, it is rather the giving birth to a new knowledge, in a new species.
    - a) A species doesn't learn something new, rather it gives birth to a new species with new knowledge
    - b) In giving birth to new knowledge, a species might often doom itself to extinction through competition with its own offspring.
- B. Members of an existing species may or may not be exploring new behaviors or new habitats by their own choice, but whether or not this is the case, the mutation, the actual change in genetic information that leads to speciation is not something that the members of the species control. **Mutation** is something that happens to a species, quite possibly as a random transcription error that just happens to work. But whether the mutation event is an expression of immanent divine intelligence or just a random result of cosmic rays, it **is not something that the species, by its behavior, can engineer.**
- C. So for animals:
1. Variation of behavior outside of a very restricted range means a significant change of form. The change of form gives birth to a new species, which does not enhance the survival value of the species out of which it evolved and may, quite possibly, diminish the survival value of that originating species.
  2. The animal cannot, by its own volition, bring about the changes of form that it wants

VIII. All of this changes with human being. **Human beings replace variation in body form by an opposable thumb. They replace the genetic coding of knowledge with language.** Therefore:

- A. Human beings can vary their behaviors enormously without a significant change of form. Human beings can live in multiple and quite diverse habitats because they can adapt their behaviors so flexibly. In a sense, humans can bring about changes of form that an animal could only duplicate by speciation, and can do so *without*

- undergoing any changes in genetic makeup. When human beings ‘speciate’ – i.e., when humans give rise to patterns of behavior that adapt them to new ecosystems, they do not cease to be human.
- B. Human beings can, through their own volitions, induce the specific ‘speciation events’ that they desire.
- IX. Now evolution is a process that takes place between as an outcome of the interaction of two principles:
- A. A principle of **variation** that introduces new forms
- B. And a principle of **selection** which judges on the survival *fitness* of those forms.
- X. With human beings, the principle of variation has been *internalized*. The force of nature which gives rise to evolutionary variation is not, with humans, something that happens involuntarily, from outside. It is rather something that happens at the behest of the species itself. We don’t have to wait for evolution to give rise to a human with wings, we can build airplanes.
- A. Human beings, as ‘universal adaptors’ have an immense advantage in the struggle for the acquisition of free energy:
1. Because human beings have internalized the principle of variation, they can adapt (speciate) much more rapidly than any other species.
  2. Because human beings remain humans even as they speciate, they can retain a continuity of memory across the transition, and thus accumulate wisdom
  3. When human beings speciate, they still remain human beings. Human beings can diversify to occupy many, widely varying ecological niches – in effect acting like many different animal species, and nonetheless
    - a) Communicate with each other across those differences;
    - b) Learn from each other across those differences;
    - c) Trade with each other across those differences.
  4. Thus the single species, homo sapiens, *as a whole*, benefits by its own diversification into sub-species.
  5. Finally, human beings speciate *on purpose* whenever it suits their convenience.
- B. The large mammals disappeared as humans expanded over the planet. Most likely they were exterminated by humans. Why? Because human beings could adapt to the large mammals so much faster than they could adapt to human beings.

C. Human beings then domesticated plants and various animals. What does *domestication* mean?

1. Diamond (in *Guns, Germs and Steel*) gives us the example of the oak tree and squirrels. Those two species have co-evolved, and are adapted to each other. How is that different from domestication? In co-evolution the species involved actually transform themselves in response to each other. We could say that oak trees and squirrels have shaped each other's being. But when humans change the behaviors of plants and animals to suit human convenience, the change is not really reciprocal. When animals speciate, they cease to be what they were. But for humans, ongoing speciation is a way of life.
2. Human beings select for fundamental changes in the forms and functions of the species that they domesticate, without themselves undergoing fundamental changes in form and function. This is the difference between co-evolution and domestication.

D. Human beings have gone beyond slaughter, and beyond domestication, to create mechanisms for releasing free energy that has been stored up by the life process (fire); and further for tapping solar free energy directly in ways that no other organism on Earth has ever done (nuclear energy, photoelectric energy) - and all of this has become possible because human beings have internalized the principle of variation.

E. Human beings lord it over a nature in which speciation requires genetic change.

F. Again, we might even say that human being is an evolution of evolution (like the evolution of evolution that took place from pre-biotic to biotic evolution), and it is in this sense that human beings are disrupting the natural order that existed before they arrived on the scene.

XI. I don't have time to do this today, but we could actually trace the evolution of our current economic system and see that it, or something very like it, would inevitably evolve once 'universal adapters' like human beings appeared on the planet. In any case, we can see that this has happened, and that it has led to an ecological crisis.

A. The ecological crisis can be summarized in a very few points:

1. Human beings are changing the composition of the biosphere too rapidly for the biosphere to evolve adaptations.
  - a) In particular:

- 1) Human beings are introducing novel compounds into the biosphere with immense destructive consequences
  - 2) Human beings are radically changing the balance of chemicals in the atmosphere
- b) Human beings are monopolizing an excessively large portion of the free energy flow on the planet
- B. This is exactly what we would expect of a species that can adapt itself at will, and that secures an overpowering advantage in the struggle for free energy – as long as that species continues to act like every other species, to commit itself wholeheartedly to the struggle for free energy, and to place its power over the principle of variation in the service of that struggle.
- XII. Remember that the evolutionary process requires two principles – the principle of *variation* and the principle of *selection*. We have internalized the principle of variation, but we have not internalized the principle of selection.
- XIII. The principle of selection is the survival of the fittest. But what is fittest? What is fittest is that *which fits within the whole*.
- XIV. For evolutionary entities prior to the human, the drama of free energy and the survival of the fittest were essentially synonymous. When new species evolve from old species in the context of a healthy ecosystem, the ecosystem will have deep resources for accommodating the variation. New species have no reason to expect things to be easy for them, and thus for them the maximal pursuit of free energy is invariably a good strategy.
- XV. Diamond tells the story of some reindeer put on an island by people. The people figured that the island could support a few hundred reindeer. They placed a few of them there and watched what happened. The reindeer, without natural predators, had a population explosion. Pretty soon there were thousands of them. Then the ecosystem collapsed, there was a mass die-off, and the island now supports less than a dozen reindeer in total. The parable of the reindeer has this hidden implication – the reindeer didn't evolve on the island, there were no natural predators, and their pursuit of free energy backfired. Human beings are exactly like those reindeer. Like the reindeer, human beings need to learn to limit their intake of free energy to be fit and to survive. If we leave the principle of selection external to ourselves, we will, naturally, crash the ecosystem.
- XVI. It's **microphase wisdom** to adapt as quickly as possible and to acquire maximum free energy. Its **macrophase wisdom** to be fit by staying just

ahead of the competition, but adapting slowly enough to allow the surrounding biosphere to adjust; and by acquiring no more free energy than that which will permit the whole around us to flourish.

XVII. It is the evolution of evolution that has given human beings macrophase power. This evolution is the internalization of the principle of variation. It is only if we continue the evolution of evolution by internalizing the principle of selection that we can develop macrophase wisdom to go with our macrophase power. That is what it will take for us to survive.