

A Scientific Anthropology: Natural Selection can Explain Cultural Progress, and Here's How

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A scientific anthropology must explain how culture works and how cultural evolution works. Moreover, it must do so *naturalistically*, which means that, if possible, our explanations must be based on no fundamental causal forces or principles other than those recognized by physical science, lest we violate Occam's Razor: "Entities must not be multiplied beyond necessity."

First, here's how culture works: The locus of culture is the individual human brain. The interactivity of culturally-acquired neural modules causes humans to behave, and their behavior produces artifacts, social organizations, and all the other observables and inferables that we call "culture", in a different sense of the term.

When brain activity ceases, so does culture, leaving behind its archaeological remains. Culture is suspended at night when we're all asleep (except when we're dreaming), and is resumed as we wake up in the morning.

There is an exact analogy to this formulation in social insects, wherein the activity of *genetically* acquired modules in the individual *insect* brain causes them to behave, and their behavior produces artifacts, social organization, and so forth. The only difference, beside the difference in complexity, is in the mode of acquisition of the neural modules.

Now I must explain how culture evolves. For units, I'll use the neural modules that cause behavior. In humans as in ants some neural modules, via the behaviors they cause, enable modules like themselves to survive and propagate. If that becomes a trend, those modules, the behaviors they cause, and any artifacts or elements of social organization that result from those behaviors, will come to predominate, to be the norm, to be successful. Darwin called this process "natural selection", an unfortunate choice of metaphor. We've come to say that the successful modules, behaviors, and outcomes are "selected" or "selected for".

In any case of selection, the environment is determinative, along with the module's behavior. But we have to understand that the environment in question is that of the module; that is, everything in the world that co-determines the outcomes of the module's behavior, right through to its relative success. Thus, the module's environment includes the features of its carrying organism and of the organism's environment, including conspecific organisms. It even includes other modules, in the same nervous system and in other nervous systems. Each module's success depends upon both how well it cooperates and how well it competes with other modules.

Now, in any biosphere region, no matter how salubrious initially, inter-modular competition is going to cause shortages of resources, however defined. In other words, life is going to get harder. Environmental challenges will multiply, even when the module-carrying organisms are not expanding into new territory. In almost every case, only modules which cooperate to produce more efficient, more elaborate and more complex artifacts and social structures will prevail. For humans as for ants, evolutionary progress is real, but it is always an outcome of natural selection. And since selection is both necessary and sufficient to produce the Course of evolution, we need look no further for a Mechanism.

For instance, I argued in 1968, and again in a presentation to NMSR in 2002, that warfare caused the evolution of the spoked wood wheel from the solid wheel, in a series of stages. It did so by providing a challenging environment in which wheelwrights who embraced each new stage-style of wheel prospered, so their neural modules for wheel-making were reproduced differentially. In other words those modules out-propagated modules that made less effective chariot wheels. This is classic natural selection: struggle for existence, environmentally driven differential reproduction, descent with modification. Result: increase in complexity, more efficient energy use, in short Progress, in transportation technology.

So, in summary, selection is an entirely natural, mechanistic process. As I've described it above, it requires no fundamental underlying principles other than those recognized by physical science, and it accounts exhaustively for cultural as well as genetic evolution. Just as we need not invent special purpose biological principles to account for genetic evolution, we need not invent special purpose social or psychological principles to account for cultural evolution; to do so would violate Occam's Razor.

* To obtain copies of works mentioned in this paper, please contact me.