

Birth and Zoological Structure of the Noosphere: Segment 2

Peter Richerson: So it seems to me that there are two things that are distinctive about our book. The first is that we really do emphasize the fundamental role of cultural evolution in human evolution. Most of the human evolution stories are really stories of the genetic evolution of humans, and to my way of thinking, to Lesley's way of thinking, and to the way of thinking of many of our colleagues in the field of cultural evolution, cultural evolution is much more fundamental than that, and, so we think that gene-culture coevolution, culture driven gene-culture coevolution, is responsible for many of the features of humans. So, most human adaptations are fundamentally cultural adaptations, not genetic adaptations. So the whole of human biology and life history is organized around exploiting the advantages of culture. So, for example, our large scale societies are important in cultural evolution because the better people are connected, the more cultural innovations can be passed around from one person to another. So we're really dependent upon having a large social network to support the kind of fancy culture that we have.

If we take that kind of a position, then the basic tools that evolutionary biologists develop to understand evolution aren't really sufficient. So for example, cultural evolution includes the inheritance of acquired variation. The modern synthesis biologists were keen to get rid of the whole idea of inheritance of acquired variation. It really is a kind of a fundamentally different way of looking at human evolution.

David Sloan Wilson: Something happened in human evolution, which resulted, basically, in a quantum jump of cooperation, including both females and males, that we need to understand. And I think that another thing I love about your book, and let me just take a little more in general terms, that we know theoretically, that cooperation can be promoted in two ways.

One is social control, so that cheating behaviors are punished, to put it briefly. And the other is environmental circumstances, where the environment really requires more cooperation. So, people cooperate more in an emergency situation than during everyday life, the environment demands it. And I think that if I understand your book correctly, and what you showcase as you move through time, is moving out into the savanna ecologically sort of shifted things to make cooperation much more important than before. In the forest, then, females, the act of foraging and stuff like that just did not require a lot of cooperation, but it surely did on the savanna. And if you could elaborate on that theme, first of all, I want to know, did I get it right? And then, for you to tell the story since you're the storytellers. So, if you could dwell on just the environmental demands for cooperation for our ancestors when they moved out into the open environments.

Lesley Newson: So, can I tell you the origin of my obsession with the idea of leaving the rainforest and going into the savanna. It goes back to when I was breastfeeding my daughter. So, you guys probably have never breastfed anybody, so you don't realize that at the moment, when the baby latches onto your nipple, you are just overwhelmed with this incredibly powerful desire for something to drink. And it's all got to do with vasopressin, and it turns out that there's really good reason for this. Why there's this instant trigger of, "oh my gosh, I need a glass of water. I need a cup of tea. I need something to drink," but it makes sense because humans produce very watery milk. And as soon as this baby latches onto your nipple, you're pouring liquid into that creature, and losing it from your own body. You can't do that in the middle of a desert, unless you've got somebody or some source of water handy.

And I kept obsessing about that because how could you just move out into the dry heterogeneous savanna, if you didn't have some way of dealing with that. And I'm assuming that Australopithecines didn't have vessels full of water that they could carry around with them. And so this is when I thought that there must've been some kind of daycare or some kind of caring so that babies could be kept near the water.

And so the mothers could be near water when they fed them. And they didn't even necessarily need to be feeding their own water. But, you can't be a half a kilometer away from the source of water if you're breastfeeding your baby. And so it grew out of that. And it grew out of this, that that had to be a story that needs to be told. Because poor men, you've never had that experience of breastfeeding. So, you need to be informed of what it feels like.

So, then it seemed to me that it was essential. Women could not travel more than half a kilometer away from a river with their baby. They had to leave their baby. So, human babies, you can't just tuck them into little holes, like you can with some babies, they're really active little things. So the best way to do it is to leave it with another mother. And maybe your sister, maybe your own mother, maybe an aunt. And that, I think, is a reasonable story we can tell about what happened with the move into the savanna. So yes, cooperation between women, not sure what men were doing.

DSW: Well, it goes on, Peter, maybe you could fill in the male perspective here, but in terms of foraging, or the kind of food that was being eaten. Of course, defense, to chase off, you know, throwing projectiles. So, speak up for our sex, Peter.

PR: Well, an alternate story you could tell is that, maybe both are true, is that out there on the savanna, australopithecines would be terribly exposed to predation. They can't run very fast compared to quadrupeds. So how did we not just fall prey to hyenas and leopards and lions and other such creatures? We know that big cats preyed on australopithecines. So, it's certainly a plausible story that at least one hazard of living in the savanna was a predation. Now, one thing that australopithecines, because they were bipedal could do, would be to carry sticks and stones, and you can imagine a mob of stick and stone carrying australopithecine males, a little bit bigger than females, so a little bit meaner and tougher, traveling around on the savanna and even big cats might be deterred from attacking a mob of stone-throwing stick-wielding australopithecines.

DSW: And Paul Bingham has developed that concept of basically stone-throwing as one of the important adaptations, which then fed into social control. But, there could be an anatomical trace for that because the ability to throw stones with high velocity, which is really one of the signature human adaptations compared to any other primate, that's a whole body kind of an adaptation. And it should be, if you know what to look for, it should be reflected in the anatomy.

PR: So to follow up on your ecological hypothesis, another thing to consider is that cooperation is really, as we've already mentioned, heavily under-supplied by nature. Because it's very difficult given, for example, selection based upon inclusive fitness, to get large groups of cooperating individuals together in animals like mammals.

And so the ability to cooperate on a large scale, means that there are lots of niches that humans can get into that other animals can't. One example is our tool-making abilities. If it takes a large group of people to exchange information, to build a large repertoire of tools and to maintain fancy tools against sort of mutational attack, then there's a whole series of niches that are open to people that aren't open to other animals. And one of these is extractive resources.