

Lesley Newson and Peter Richerson with David Sloan Wilson, Part One

David Sloan Wilson: Hello, this is David Sloan Wilson, and I'm so happy to be with my good friends and colleagues, Lesley Newson and Pete Richerson. Hello, Lesley and Pete.

Peter Richerson: Hello, David.

DSW: And we are here to talk about your new book, "A Story of Us." There it is, a new look at human evolution, and so, such a great topic. And I want to begin by asking you, of course, so many books are coming out on this topic. We go all the way back to when you were pioneering the study of cultural evolution with Robert Boyd in the 1970s, I was with you then, at the University of California in Davis. We've come such a long way. There's now many books out on human cultural evolution, but yours is very distinctive, and I think that's due in part to Lesley's influence. And so I'd like to hear from you, what is it in your own minds that sets your book apart from the many other fine books that are coming out on human evolution?

PR: 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. The other feature of it, of our book, that Lesley can speak to more than myself, is that we're really trying to appeal to people outside of academia. And one part of that is that we tell these fictional stories as part of each of the substantive chapters in the book.

In other words, we tell a little story about what life was like as an Australopithecine, for example, or what it might've been like. And the book is called "A Story of Us," rather than "The Story of Us," because the historical record, the paleo-anthropological record is really pretty depauperate. You can't tell a connected up story based upon the hard scientific evidence. If you're going to tell a connected up story about how people live, you're going to have to engage in a certain amount of science fiction. There just isn't enough evidence to really tell us exactly how people lived in the past.

Lesley Newson: And at least we're honest about it, to sense that we don't want to preach-

DSW: I was very sternly lectured by Lesley when I said "The Story of Us" on Twitter, and in no time it was "ahem, 'A Story of Us,' David."

LN: Yeah, well it's arrogant to think you're going to give the last word on anything in science, right?

PR: So the young paleontologist at the University of Arizona, Charles Perreault, has written a whole book about why the archaeological and paleoanthropological record is too skimpy to tell a completely connected up story about how people lived. The same thing is true, actually, with the historical record.

Several years ago, Joe Henrich, and with a certain amount of assistance from Rob and I, published this paper on monogamy. And one of the ancillary things that Rob did was organize a little symposium at the Santa Fe Institute, and invited some historians concerned with ancient societies, and the question was, what were the actual marriage patterns of Romans and other classical civilizations? And the answer, is we have a few anecdotes from the elite, what the elite classical authors wrote down about...for example, the scandalous behavior of some of their colleagues with their concubines and slaves, but we have no idea even whether that really characterized all Romans or whether it was the exception, and when it comes to the marriage patterns of the non-elite, we know practically nothing. So, even the historical record is really lacking in lots of details that would be necessary to tell a complete story about even life in ancient Rome.

LN: Can I come in now and say that it isn't just lack of information that leaves stuff out of stories. It's also lack of thought about what must have gone on. Because we're all in our own little world, right? We live in a modern society and we can't help imagining that whatever happened in the past was a bit like today. And yet a moment's more thought makes us realize that it wasn't like today. And so there's a lot of really good room for speculation. And one of the things that I really wanted to bring to the book was that there must have been women involved in evolution. You know that Sarah Hrdy started preaching about that a long time ago, that women, if anything, must've played the major role in evolution, because what evolution is all about bringing up children. And that was what women did.

And so, if you started thinking about the problems that the females had bringing up children and staying alive themselves, you just bring a much richer story. You create a much richer story. And yes, it is a bit creative, speculative, but we understand reproductive biology. We know what kind of roughly went on. And, that's what I wanted our stories to do it. I wanted to create stories that would make people think about the problems our ancestors faced at different stages in their evolution. And then once they read that story and kind of got washed over with a feeling of what it was like to live 3 million years ago, 7 million years ago, a hundred thousand years ago, then hit them with the evidence. Because by this time they're going, "why do they say that? Why do they say that?" And then hit them with the evidence for it. And because I think that will be a more interesting, realistic way of going about telling the story. But of course, you have to be really interested in it. You have to be obsessed with evolution, really, to want to know what happened in the past. We tried to feed that obsession.

DSW: We've said a lot already, but I think that on multiple stories, I think, that's true just in the present without worrying about history or different cultures, even within our own cultures at this moment, there's multiple stories. That's in part, because stories are not just renderings of facts, stories are much more than that. They're tools and world views and all of that. And then as you add history and other cultures, it becomes even more complicated, more speculative, more partial, therefore, room for still more stories. Then there's that. And I think that also, Lesley, the perspective, we all have to say that, of course right now, male domination, and all of their forms is on everyone's mind, and that goes to the science. And so the idea that the human evolutionary stories is not just about what men did, it's the women and children, and the whole thing is another thing, which I think is certainly very distinctive about this book in comparison to other books.

Yes, we have Sarah, we have others and so on, but I think this is a big bias to correct. And then the style of the book, that you begin with the story, and then you say, here's the facts that caused us to make this story. So you separate the story from the best of our knowledge, which is in the first place, makes it very readable, and then second place, it's great that you can just kind of involve the reader in that partitioning. But there's still something else which is distinctive about your book, which is that it starts a lot farther back than a lot of books. And I was really fascinated that you push the history back to our ape ancestors while they were still forest apes, and then our ancestors, as they moved out into the savanna. And I'd just like to hear from you, why was it that you felt the need to start that far back? I really

appreciated that you did, but why was it that you felt that need to start so far back? Lesley, why don't you go first? And then Pete.

LN: My feeling is that people who are interested in evolution, but not really trained in it, often look to chimpanzees or bonobos or whatever and say, "well, they do it like this, so maybe that's what humans do too." And they can't help but look to what chimpanzees do. And there are scholars who encourage them in that, they go, "all the way back to chimpanzees, we were already committing murder." And, I mean, yeah, okay, but if you're going to have that kind of talk, you want it to be supported by some kind of real understanding. And we have no idea if our ancestors 7 million years ago were going around and murdering other people, but we do know that they were having babies. And we do know that they were apes, and we know enough about apes and how our shared ape biology is, that we know it must have been really, really hard for those females, raising those little apes on their own.

And not just keeping them alive and feeding them, but also allowing them to learn all the things that they would need. Because we know that the reason why apes have this quite big brain compared to other mammals, is that they have to learn the intricate environment they live in and how to exploit it. And that's what baby apes get from their mothers, along with so much protection, and so much food, everything like that. It's all about women. It's all about female apes. And so we wanted to start there and then talk about the stages, which gradually introduced males into the really important job of producing the next generation, which I think happened maybe 2 million years ago. Okay, over to you, Pete, when do you think we got males involved in reproduction? Other than the few seconds it takes to conceive a baby?

PR: Well, hard to know exactly when males got involved, but we certainly know by the time we get to the ethnographic hunter-gatherers, that we know from the work of anthropologists, that males became extremely important because we do have these very expensive kids to raise, and without help from other women and from men, mothers just can't raise so many offspring.

LN: I just want to say that we need to explain why our kids are so expensive. It's not just because they need toys, and want clothes, it's because they have these enormous brains that have to grow and require so much energy, and so many nutrients to get big enough.

PR: Human babies compared to other ape babies are much more helpless and require much more time and investment on the part of mothers to just take care of them until they're at least toddlers are just an enormous burden on the labor of mothers. And so mothers can't go out and forage enough to keep their babies alive. They have to be assisted by what are called allomothers. People who help them, including males, work hard. So one of the great transitions from apes to humans is that males get put to work. In most mammal species, males, all they do is fight amongst themselves for access to females. In terms of contribution to the raising of the next generation, aside from their genes, they're worthless. And somehow in a few species, humans being a conspicuous example, males actually do something useful to help women with the material aspects of raising kids. They don't contribute just their genes. They contributed a ton of calories to the rearing of offspring.

LN: Protection too, protection as well.

PR: Yeah, physical protection from other males that might molest them and so on, from predatory animals.

DSW: This is a point I want to establish with all of us, that I think many readers or many listeners don't really know, and it's quite disturbing to focus on. It is how many animal societies, including primate societies, are despotic in human terms. They're not highly cooperative, and part of that despotism comes from males, but it also comes from females. So there's societies in which the females are highly hierarchical. And they're not all cooperating with each other. There's primate societies in which, actually, a female is pretty much on her own, or maybe with her just immediate kin, raising her offspring, was

really threatened by other female lineages, and so on. So they stay together as groups, they're social. Often they're social because to be solitary would be a certain death warrant, but nevertheless, they're not societies that we would want to live in.

We would classify them among the most despotic of human societies. And that even goes for chimps to a large extent. Richard Wrangham is a person who does that, and also Joan Silk, Rob Boyd's wife, has done great work on that, showing that when you do behavioral economics experiments with chimpanzees, in which they get to choose between a reward for them compared to the same reward for them, plus a reward for another chimp, they're indifferent. By that measure, they just don't care. And so, that's one of our closest relatives, a different story needs to be told for bonobos, but 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.

LN: 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.

So Kim Hill and colleagues have argued that the human diet is largely based upon resources that require tools to exploit, that require cooking. Or opening packages of seeds that are defended by very hard shells. And so it takes pounding with stones or something like that to open them, fermentation. So we have a whole bunch of techniques for transforming crummy food into food that we can eat. Of course, we require a really high quality of food by comparison to other apes, even much less specialized herbivores. But we can go after packages of food that other animals can't, because we essentially have a cooperative system for maintaining fancy culture.

DSW: You're mansplaining, Pete, you're mansplaining. Lesley wants to talk.

PR: Well, that's fair. We got to get our word in here. Women use tools, too. It's not like there's a gender difference in the use of tools. I wouldn't say.

LN: Right, but I want to talk about social tools. Because one of the things, this phrase that I heard and I immediately thought what a great phrase to describe what humans have is social tools. And so these are tools that we can use to help us work together in some ways. And even though despotism is terrible, it can actually be seen as a social tool, inasmuch as if you have a hierarchy, at least it keeps down the fighting. I mean, if everybody knows that Joe—you can never, ever win with Joe because he'll always win, because he can beat you up. That's a useful piece of knowledge. That's a social tool. It's a pretty nasty social tool, but it's what chimps use.

DSW: It's one step up from anarchism, but keep going.

LN: Right, yeah. I mean, I reckon, again, I'm thinking from the woman's perspective, is that a really important social tool was learning to teach your children not to beat up on one another. Because one of the things about this place, we're imagining where the babies are kept and the toddlers are kept safe near water, there's going to be a lot of kids. And you don't want the big kids to beat up on the little kids because it's damaging your own fitness to have the older kids beating up on the younger kids. So what do you do? You invent the social tool of preventing bullying by punishing it. So you say you've got to learn not to hurt your brother. You've got to learn not to steal from your brother. You've got to learn. And kids that couldn't learn that, they had to go. I mean, you can't have an unteachable bully in a group. They had to go. And that meant they couldn't survive.

So I think that the social tool of parenting and making decisions about which kids to keep and which kids to pack off was the one that selected genes for youngsters who could learn and learn that they shouldn't bully and learn how to control anger and greed. And so many of the other emotions, which are potentially very damaging for cooperation.

DSW: Yeah. I think you're providing a parental context for a thesis which has been developed in the context of male interactions, whereby Christopher Boehm, Paul Bingham, Richard Wrangham of the need basically to control bullying. And then, you're basically stressing the same need among children and the role of mothers or other alloparents in doing that.

And I wanted to quote from a book I'm reading now by Tyson Yunkaporta, who is an Australian Aborigine, who has written a book called Sand Talk: How Indigenous Thinking Can Save the World. So this is an indigenous person, although one who is very familiar with modern life, as well, you could call him a cultural hybrid, is explaining indigenous thinking to us Westerners. And he has a wonderful passage here in which he is describing the emu and how it figures in Aborigine folklore.

And he says emu was a troublemaker who brings into being the most destructive idea in existence. I am greater than you. You are less than me. This is the source of all human misery. Aboriginal society was designed over thousands of years to deal with this problem. Some people are just idiots and everyone has a bit of idiot in them from time to time, coming from some deep place inside which whispers you are special, you are greater than other people and things, you are more important than everything and everyone, all things and people exist to serve you. This behavior needs massive checks and balances to contain the damage it can do.

And so I think this is such a wonderful affirmation of what we have come to as scientists. I think we have correctly intuited this need for social control in all phases of life. Women, children, men. Always there will be this impulse for self-serving behavior, which needs to be controlled in addition to whatever the environmental forces favoring cooperation, no matter how strong those environmental forces are, there will be cheating strategies. And so that's, for me, so important. And if you could both just kind of speak to that theme in any context. Men, women, children, any context.

PR: My way of thinking about it is that emu, and chimpanzees, and many other species of social animals, their societies are structured by dominance hierarchies. And dominance hierarchies have exactly that vice that your author describes. So it seems to me that the human analog of an individual that seeks dominance are human psychopaths. So psychopathic people believe just as your emu does in your Aboriginal story, that everything revolves around them. They seek to exploit and dominate others in a very selfish way. Human societies are also structured by prestige. Many years ago, Joe Henrich and Francisco Gil-White wrote a paper about how human societies have these two sources of leadership, if you want. One based upon prestige and one based upon dominance.

So to get a prestige-based system, the leaders are prosocial, because their status comes from voluntary grants of recognition of their leadership role by their followers. Dominance comes from the use of force

or the threat of force to work your will. So in humans, the frequency of psychopaths amongst males is something like 2% or 3%. It's presumably, as your Aboriginal person suggests, it's a continuum. We've all got a little bit of the psychopath in us, but the clinical cut point would suggest that maybe 2% or 3% of human males and about half that percentage of females are psychopathic. So in the course of the evolution of us from our ancestral apes, we've reduced the frequency of psychopathy from something like a hundred percent to something like 3%. And psychopaths, at 3%, are still a big problem. I mean, our jails are full of them and our boardrooms are full of them and they cause a lot of trouble. But human life is only possible because we've squeezed down the frequency of psychopathy to a few percent.

DSW: Richard Wrangham elaborates on that theme in his Goodness Paradox book and his other books. Lesley?

LN: I'm just thinking about, if throughout our evolutionary history, humans have grown up in a situation in which they have expected control. In a way, could it be true that they have to have that little spark of selfishness or else they could be completely vanquished? I mean, I think that with so much, there's a bell curve for continuum. And on the one side are the psychopaths and on the other side are people who are just sort of so selfless, it's hard for them to survive. And, maybe there's a huge role for the social environment, especially with young children to actually play down the psychopathic aspects of our personality and play up the cooperative aspects of our psychology and in ways that we haven't really explored enough because people haven't taken this evolutionary understanding of the environment in which humans evolve.

PR: I think that the problem with humans is that we can't, at least so far, haven't figured out any way to be like social insects. And so to create workers, if you want, that don't reproduce at all. So for humans to survive, all of us, or pretty much all of us, have to engage in reproductive behavior. And the ordinary rules of genetics apply to the inheritance of genes. So we have to look after our own reproduction.

Nobody is going to just let us reproduce if we can't compete in the marriage market, for example. So that means that the sort of perfection of humans, along the lines of a social insect colony, where the workers are completely selfless, that pathway is not in any obvious way open to us. So that humans are always going to be sort of a balance between enough selfishness to compete in the marriage market and enough altruism to participate in all of these cooperative things that humans do. And, to my way of thinking, we're in any obvious way of perfectible, in terms of cooperation. There's an irreducible element of selfishness that we inherited from our ape ancestors, but there's-

LN: No, I don't think we just inherited it. I think it had to be maintained throughout the whole thing.

PR: Yeah.

LN: That's what you're saying.

PR: Exactly.

DSW: So I think that this is the distinction between so-called fraternal versus, what is it? Egalitarian and... What's the two terms that are used for major transitions? What are they? Alan? Egalitarian and fraternal. Two paths to cooperation. And social insects, by virtue of their genetic relatedness, are... Why they call them fraternal, I don't know. Sororal would be the other would be the more apt term. Whereas, if you're not genetically related, basically fairness and democracy is called for.

It's like basically equal opportunity. And so that's the form that human cooperation must take. It requires being assertive. And so when we talk about selfishness, if the form of selfishness says, you can't push me around, you can't bully me. We're going to do what we decided to do. I mean, so basically there's an individualistic element to that, but there's also a communal element to that.

Another model for that is the rules of meiosis. There are rules that dictate that every chromosome has an equal chance of getting into the next generation. That's fraternal. I mean, excuse me, that's egalitarian, not fraternal. But I think that that can be perfected. So I think that human cooperation is not intrinsically flawed for that reason. In principle, it could be so highly fraternal that it ends up being ultra-social and so on. So I want to segue to kind of the cognitive dimension...

LN: Before we move on, can I just say, isn't that what we need social tools for? I mean, it's going to be a cultural solution and we're going to have to develop, in our culture, tools so that we can look at the rough material that our genes provide us with and teach us how to be cooperative and yet maintain our autonomy, if that makes sense.

DSW: The entire concept of morality hinges on this. The whole nature of moral systems, with its obligatory dimension and its voluntary dimension, hinges upon this. If that's what you mean as social tools, then that's absolutely right. Moral systems is like the system that evolved in order for this to take place basically is the way I would put it. Pete, please.

PR: So social scientists use the term institutions. So they argue that human societies are bound by more or less formal rules of morality, if you want to put it that way. And that is one of the distinctive features of our use of culture, to organize our social systems. As far as I know, there's only the most rudimentary and controversial examples of institutions in the societies of other organisms.