Joan Roughgarden
"Deconstructing Darwinian Selfishness"

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Michael Dowd (host): Welcome to Episode 31 of "The Advent of Evolutionary Christianity: Conversations at the Leading Edge of Faith." I'm Michael Dowd, and I'm your host for this series, which can be accessed via EvolutionaryChristianity.com, where you too can add your voice to the conversation.

Today, Joan Roughgarden is our featured guest. Joan is an evolutionary biologist and founder of the Earth Systems Program at Stanford University. She holds a Ph.D. in biology from Harvard University and has authored more than 160 papers and eight books, including *The Genial Gene*, *Evolution's Rainbow*, and *Evolution and Christian Faith*. Here, Joan and I discuss "Deconstructing Darwinian Selfishness." (*Note: A bloggingheads.tv conversation between Joan Roughgarden and Robert Wright can be seen or listened to here*.)

Host: Hello Joan Roughgarden, and thank you for joining in this conversation series on evolutionary Christianity.

Joan: Thank you very much for the invitation to participate.

Host: Well, Joan, I was particularly interested in having your voice represented because you bring a groundedness in evolutionary biology. We've got a number of scientists, but we've got many more theologians and ministers. You've written on this exact topic—*Evolution and the Christian Faith* is the title of your 2006 book—but you also bring an understanding of biology, an understanding of evolution, that's far deeper than the average person in the pews. I've been asking all of my guests to begin by sharing a little bit of their story: How did they get to be where they are, in terms of their own thinking? What have been some of the major mileposts, the significant events, either religiously or scientifically? So, help us know how Joan Roughgarden got to this place of holding both evolution and Christianity.

Joan: The biology curriculum for a student involves a huge amount of memorizing and very little thinking. It was, in part, because of that [situation] that I started a second major, in philosophy. When I graduated, I had two degrees—one in philosophy and one in biology. The

biology part I knew I was going to use to make a living; the philosophy part was the part that was fun. But then I went into ecology and evolution because it was the only area of biology that had a strong tradition of mathematical theory. I was particularly enchanted by developing mathematical models for evolutionary and ecological processes. Towards the end of my Ph.D., I also began fieldwork and spent about 30 years working primarily on the islands in the Caribbean and focusing on the lizards there. In the '80s I also worked a lot on the barnacle populations off the California coast. So I've done a lot of fieldwork in marine biology and marine ecology, and terrestrial ecology.

By now, I have a whole bunch of biology books [I have written], including textbooks, and about 140 papers. What you're most interested in, and obviously what's attracted most public attention to my work, is what I've been doing in the middle to late 2000s—beginning with my book *Evolution's Rainbow* in 2005, then *Evolution and Christian Faith* in 2006, and then my most recent book, last year, *The Genial Gene*.

Host: I'm curious, Joan, where in your own trajectory—where in your own faith journey—did you bring these two together in a mutually enhancing way?

Joan: I'm a cradle of Episcopalian. I grew up in Indonesia and the Philippines. When we were in the Philippines, my father was working for the Episcopal church. He wasn't a missionary in the sense of being a minister, but he was a construction engineer, and he was building churches and hospitals in Zamboanga, in Mindanao in the Philippines. Then, he was working for the U.N. when we were in Indonesia. So I had been basically going to church through high school. When I was in college, I just drifted away. I never had any great crisis of faith or anything. And then I went through some personally difficult times in the '80s and started going to church. Whenever I've been in emotional trouble, I've always known that the church was there. And when I move to a new town, the first thing I do is I go to church, and I start meeting people through church.

I always wind up having my social life revolve around church and the people I meet through church. It's always been part of my life. There's no particular moment that made me say, "Well, let's bring science and religion together." From the Episcopalian point of view, there has never been any great concern with evolution. As Episcopalians like to say, "You don't have to check your brains at the door when you walk in." So it was always puzzling to me, as a scientist, why anyone would think there *was* a conflict between science and religion. I've tried hard to understand how Creationists think—where they're coming from and why they're so concerned.

I received an interesting idea from one of the parishioners at St. Gregory's, Betsy Porter, who works on icons. She did the cover picture for my book, *Evolution and Christian Faith*. She drew the icon. And she always says that, for her, drawing an icon is a form of prayer. That really stuck with me because, similarly, if we think that Creation is the work of God, then to be a scientist and to understand his Creation is also a form of prayer—every bit as much as drawing an icon is.

It's interesting how the natural processes that we work on can lead to what we have. It's really pretty amazing to look at how evolution actually operates—and that God, if you will, was ingenious enough to get this all going.

Host: And it's possible to see that God—Ultimacy, Reality itself (also here)—is working in and through this process: that there's 13.7 billion years of creativity. It's not as though that creativity happened only at the beginning and kicked it all into gear and that the whole thing has been secular ever since. Or, as some think, like Teilhard de Chardin, that God is the Omega point: that beckoning, that Reality, which is calling all things unto itself. There's also the sense that God / Reality is revealed in and through the creative process. All three of those—past, present, and future—can be legitimately seen as the process of divine creativity; the process of grace unfolding, if you want to use religious language.

Joan: Yeah, exactly. There's nothing in the Bible to say that it happened once and for all. Sometimes I think we really need to be discussing *religious* matters rather than scientific matters. Certainly, when I talk with Creationists, I think it is most helpful to discuss what's in the Bible. It's not particularly helpful to trot out the evidence for evolution. That's been an unproductive mode of discussion, because then people start arguing about, sometimes, very far-fetched interpretations of the data. One of the things I was clear to do in *Evolution and the Christian Faith* was to focus on the minimum data set you need to be convinced that there's something going on here. It's easy to get sidetracked into arguments about peripheral issues and to lose sight of the fact that evolution itself is occurring.

The thing I really like about Creationists is that you know where they're coming from. They say they're religious up-front. So you can have a discussion about what's in the Bible. You know the terms of the discussion. The thing I found so sleazy about the Intelligent Designers is that they're not up-front about where they're coming from. They claim to be secularists, they claim to be scientists—and yet they're not. They don't utter propositions that are themselves falsifiable. They're not willing to put their own ideas to the test. And they're mostly lawyers—not scientists. So you can see them spinning clever little tales. They're spin doctors, really. And that's not helpful. It's as though they're trying to win cases on technicalities all the time, and losing sight of justice. And that isn't true in my experience with Creationists. Now, some scientists have a lot of trouble talking to Creationists, but I don't. I don't think it's a problem to sit down at the table with Creationists. I don't think [talking with Creationists] has, in any sense, undercut science.

Host: You bring a valuing of both science and Scripture, and you bring a respect for Scripture in a way that many non-Christian scientists just don't have. So Creationists aren't going to be turned off by you, unnecessarily, at the start for dissing what they view as the highest, holiest thing in the world. My own take on why many Creationists are threatened by evolution is that they see the Bible as divine communication and divine guidance, but they've not yet made the step to seeing evidence as divine communication and divine guidance.

Joan: Yes. Nicely put.

Host: Joan, could you say a little bit about your 2006 book, *Evolution and Christian Faith*.

Joan: That was done when there was a lot of attention being given to the challenges to evolution in Kansas and elsewhere, and when the Intelligent Design movement seemed to be garnering a lot of attention. I felt that very few people knew what evolution was. They didn't even know what was being taught. I needed to write a tiny little book that said, quite succinctly, what it was that evolutionary biologists actually teach. What is it? I needed to present this [information] in terms that were friendly to people of faith.

At that time, I was living in San Francisco and attending St. Gregory of Nyssa in downtown San Francisco in the Portrero District. It's a very inquiring community. So these were the people I had in my mind's eye when I wrote the book. They were inherently suspicious of the Intelligent Designers, but they didn't know what evolution *was*. They didn't have grounds for thinking that evolution might be okay; they were just suspicious of Intelligent Designers. So, through the course of discussions there, it became clear that there were passages in the Bible in which the basic concepts of evolution are already presented. In particular, there are passages that pertain to breeding: to farmers breeding livestock. I isolated those passages and brought them forward.

A lot of people who were concerned about evolution are worried about the concept of randomness. That concept is also present in the Bible, especially in a parable from Jesus, where the mustard seeds fall from a cart at random. Because these basic ideas of randomness and selection are already present in the Bible, what I did is to show how the basics of evolution are already contained in the Bible. Now, Darwin, you might say, put them together. They're not put together in the same verse and chapters in the Bible—but there's nothing foreign or hostile about the essential notions of evolution. And that was the main purpose of that book and has, I think, been quite helpful.

The context where, I believe, it's been most helpful is with other biologists. If I give a lecture at a university and then go out with a bunch of the graduate students for pizza or something, I'll ask, "How many of you are harassed by your parents when you go home for the holidays?" Typically, about 3 out of 10—which is a lot!—will say that their parents or their grandparents or a relative will accuse them of doing the work of the Devil and will really give them a hard time. These people especially needed to know how to deal with this religious harassment. They needed to be able to point to the Bible in a texturally literal way and say, "This is in the Bible, and there's nothing the matter with it. There's nothing the matter with evolution because its basic ingredients are in the Bible." That's where [my book] has been really helpful to people.

Host: If you're empowering and relaxing people who are immersed in the sciences to be able to interact with their religious family members from a place of ease and not being threatened—

and being able to protect themselves from being beat up—that in itself is quite a ministry. My hunch is that your reach in your own work has gone far beyond that. But even if that's all it did, that's a huge niche that not a lot of others are filling.

Joan: It's nice of you to say that. It's still early. Most recently, the largest impact is coming from the people at the magazine *Tikkun*, which is, as you may know, a Jewish magazine (in terms of its origin). It's published by Rabbi Lerner. In this case, I'm trying to get Jewish thought to be more positive about evolution. But they're also very concerned about scientism—which I know a lot of Christians are concerned about as well. They're wondering if evolutionary science can be done in a way that is more spiritually informed than it currently is. We're trying to understand what that would mean, what form would that take.

I've pointed out that, when it comes to doing science, you find out what you find out. I mean, what's there is there—you can't change that. But what you could do is entertain a wider array of hypotheses to investigate. I even got Richard Dawkins, of all people, to agree to that. In a debate we had down in San Diego, we agreed that ideological uniformity of evolutionary biologists is leading them to look at only a subset of the possible hypotheses. We see this all the time in the phenomenon of cooperation: If they're convinced that the selfish gene is literally true, then they're not going to even entertain hypotheses about cooperation and mutual benefit. And, therefore, they're not going to do good science—because science ultimately turns on having a rich and thorough and exhaustive set of hypotheses to investigate. Then you go ahead and you do your experiment, take your data, and do your job.

So, at the very least, having more spiritually oriented people doing science will lead to better science. The question, though, is whether it would do any *more* than that. That's where some of the folks at *Tikkun* think that even more might be possible. I'm not there yet; I can't envision that we would find out anything differently from a spiritual perspective, other than simply entertaining a wider array of hypotheses than we currently do…

Host: … and possibly also widening the horizon in terms of meaningful, or inspiring, or empowering, or bridge-building interpretations of the data. This is one things that is near and dear to my own heart (and Connie's, as well): It's recognizing that the task of interpretation is an essential one for human beings. We can't *not* interpret, in fact. And yet, how do we interpret in such a way that the resulting interpretations empower a large number of us across a wide religious diversity to work together for a common healthy future for all of us? How do we interpret in ways that engender compassion, generosity, integrity, care, consideration and all these pro-social feelings and behaviors? The task of interpretation is a vital one. I think it's an important conversation for religious people, spiritual people, to have in terms of how do we speak about science in ways that are deeply religiously inspiring.

Joan: Right. The issue that I'm presently concerned with is the way in which evolutionary biology is being misrepresented to the general public and to other biologists. The history of evolution, of course, begins with Darwin, writing in the 1800s, who had a long and

distinguished career as a brilliant naturalist. The problem with Darwin's work is that it was done before genes had been discovered. So he had a lot of difficulty understanding how to deal with inheritance—the whole issue of inheritance, which is obviously central to evolution. It wasn't until the 1920s and 30s that biologists revisited Darwin's thinking and updated it by including knowledge of genetics—Mendelian genetics, at that time. This renovation—or rehabilitation, you might say—of Darwin in the 1920s and 30s is called neodarwinism. The theory of evolution we have today is basically the neodarwinist account.

The neodarwinist account is fairly innocent, theoretically and philosophically. It simply lays out what the consequences *are* of natural selection on the gene pool. When Darwin was writing, there was no concept of the gene pool because genes weren't known at that time. And so now we refer to evolution—and natural selection, in particular—as changing the gene pool of a population through time. [J.B.S.] Haldane, [Ronald] Fisher, and others in the 1920s and 30s developed the first equations that show how the gene pool changes under the action of natural selection.

The theoretical basis for evolutionary biology is incredibly well established. For people who are mathematically adept, it's possible to prove a great many of the assertions about evolutionary biology.

In the 1970s, when I first started teaching, there was a lot of discussion in the wind about understanding traits as being present in a population "for the good of the species." So if you would just turn on the 1970s equivalent of the Discovery Channel, or listen to a nature show of some sort, what you'd hear is all sorts of narratives about the good of the species. For example, if two deer are fencing with one another with their antlers and they don't kill each other, then that would be described as an adaptation for the good of the species. Or, if a parent gives its children food, then that would be understood as promoting the good of the species. This narrative of understanding the adaptive character of traits as promoting the good of the species was widespread. It was against that narrative, that Richard Dawkins wrote the book *The Selfish Gene*. I remember teaching from it in the 1970s.

[Prior to that book] G.C. Williams and other biologists had critiqued the emphasis on understanding traits as benefitting the species rather than the individual. Richard Dawkins publicized and popularized the critique from G.C. Williams and others at that time. When I was beginning to teach in the early '70s, it was clear that we had to do something about this popular narrative of understanding traits as being to the benefit of the species. Instead, the evolution of traits rests on the value that they have to the individuals that exhibit them. If there is any consequence for the species of individual behavior, then that's fine—but that's irrelevant to why the traits evolved. It's in that context that we have the selfish gene [theory] coming out from Dawkins.

Dawkins's later writing, and the writings of most other biologists since then, have tended to emphasize the selfishness more as a reality rather than as merely a metaphor used to change the direction of thought away from group benefits to individual benefits. So the problem that we now have is the popular impression that evolution promotes selfishness. Dawkins in his later writings has all sorts of quotations arguing the lack of empathy in nature

and the brutality of nature. So the question that we evolutionists face is whether this an accurate portrayal of evolution. Does evolution actually lead to selfishness and brutality, and to devious and diabolical competition, ubiquitously?

I became aware that the presentation of evolutionary biology as selfish, and as revolving around individual selfishness . . . I became aware that this was inaccurate, back when I was writing *Evolution's Rainbow*. *Evolution's Rainbow* was a survey of gender and sexuality throughout nature. It's the first publicly accessible book that goes into just what sort of diversity occurs in this regard. The key point here, though, is that it became clear [to me], when reading how biologists describe the diversity in gender and sexuality, that they often do so in pejorative terms—as though to insult the animals. I was wondering, Why would biologists, who are scientists, why would they describe animal behavior using loaded terminology? Then it became clear that what was most problematic about the sexuality in nature is that it promotes cooperative relationships—and it's the cooperation that is most troublesome to people.

Host: I'd love for you to say a little bit more about that, because this is a topic near and dear to my heart. I took a course with Lynn Margulis, back in 1989, at the University of Massachusetts, Amherst. Also, David Sloan Wilson has become a dear friend of ours. The idea that evolution says that we're all just selfish completely ignores the fact that we're group animals and that sociality is our nature. Sociality is where many of our pro-social feelings and pro-social behaviors emerge. So I'd love to hear more of your understanding and about the nature of sexuality—that it's not just about procreation. It's as much about bonding as anything else. So I'd love to hear your take on all that, because I think you've got a rich perspective on it.

Joan: When I was writing *Evolution's Rainbow*, it was clear that there was a great deal of sexuality going on between animals that wasn't directly related to procreation, but was only indirectly related to procreation—or, you might say, to the successful rearing of the offspring, rather than the procreation, as such. It's especially clear if you look at our closet relatives, the bonobos, where there's a great deal of sexuality going on, but it's primarily for promoting bonds and friendship. A lot of that sexuality, I might add, is homosexual; but a lot of it is heterosexual, as well. For the most part in heterosexual matings, there are a great many more matings that take place than the number of offspring produced. You might think from that that mating was a very inefficient process, but what it really points to is that the mating activity has a function other than the mere exchange of sperm.

Host: For those listeners who aren't familiar with the term bonobo, they're also referred to as pygmy chimps. Isn't that right?

Joan: Yes. Our closest relatives are the chimpanzees, and there are two chimpanzee species. One of them, the common chimpanzee, is more of a savannah animal; and then the other chimpanzee—the bonobo, or pygmy chimpanzee—is a more forest animal that's in the Congo.

So the issue of mating having more purposes to it, other than the mere exchange of sperm, is pretty obvious across zillions of species. You can see birds, for example, who mate 100 times per egg produced. You might say, "Well, that shows that mating is very inefficient." But that's really showing that they are communicating through the mating—they're bonding.

I once had a student who said to me, "Oh, that means they're multi-tasking." So mating is multi-tasking—which you would expect, because most of the traits that we have, and that other organisms have, fulfill multiple functions.

It's also important, I think, not to focus on mating, as such, as promoting bonding. Mating is a special case—one of a great many of physically intimate behaviors that animals have. You've probably seen animals who groom one another, birds who preen each other, and animals who sit together a lot. And then, there are animals that really stay in touch with one another by continually calling back and forth. In the case of the physical contact between the animals, it's clearly mutually pleasurable. The animals are exchanging tactile communication and reciprocal pleasure. And I've conjectured that, even when birds sing with one another, they're experiencing a kind of pleasure—not unlike the pleasure you would experience singing in a choir. So in my theorizing about cooperation, it revolves around natural selection producing pleasure receptors as the proximal, or immediate, motivation for the behavior.

Now, as you indicated, David Sloan Wilson has pointed out, and I think accurately, that the amount of selfishness in nature has been greatly exaggerated—particularly by writers in England, such as [Richard] Dawkins, but also many others. However, David Sloan Wilson advocates an answer to this problem (of why there is so much cooperation) by arguing that group selection is going on. I think he's mistaken on this—and that that's not empirically accurate. He represents an older conceptualization of the problem—in fact, going back to the '70s, where we understand individual selection as being contrasted or pitted against group selection. David Sloan Wilson has done a lot to resurrect the idea of group selection and make it much more mathematically rigorous and plausible. But the question is whether it's actually true. Is the cooperation we see in nature explained by group selection, as David envisioned?

Host: He refers to it, of course, as multi-level selection.

Joan: Yes, multi-level selection: where there's selection, so to speak, for selfishness at the individual level and for altruism at the group level—and that these two processes operate in opposite directions. But it's still a selection process at both levels: selection in one direction at the lower level, and selection in the other direction at the higher level. And If the strength of the group selection component is strong enough, it can overpower the individual level selection. That's possible mathematically, and you can develop experiments to show it in the lab. You can actually produce instances of this. I think David has done some of that himself, and also others have, but there's just not a lot of evidence for this. . .

Host: … outside the human realm. There is a lot of evidence for that within the human realm. Wouldn't you agree?

Joan: Yeah, well—but the problem is *outside* the human realm, from a biologist's point of view. And I'm not sure that I would say that [multi-level selection] was true in the human realm either. I'd like to see the data on that. Therefore, the work that *my* lab has been doing since about 2005 / 2006, and which is all summarized in my recent book, *The Genial Gene*—we've developed an entirely different mechanism for the evolution of cooperation, social cooperation. It's a two-tier process, but not a multi-level selection process.

Host: This is fascinating because I haven't read that book of yours. So this is entirely new territory for me.

Joan: We envision the evolution of social behavior as occurring in two tiers. In the lower tier, which is the behavioral tier, the animals behaviorally interact. They talk to each other; they exchange gifts. They do whatever it is that they do behaviorally. Through their interaction with one another, they acquire experience, which changes their capabilities. So they actually develop capabilities and traits through interaction. The culmination of these interactions, and the traits that they thereby manufacture in each other—the culmination of these is associated with a fitness, a genetic fitness, at the end of the season or at the end of their lifespan. That genetic fitness feeds into the higher level, which is the evolutionary tier. At the evolutionary tier, there *is* a selection process.

Unlike David Sloan Wilson, who has *selection* at both levels, we have *development* at the lower level—*interactive development* —and at the higher level we have *selection*. The selection at the higher level could be either individual or group. I'm agnostic on that. So, therefore, it's through participation in a social system that an animal benefits as an individual. It's through the social behavior that we have the promotion of individual-level adaptation. We don't need to make recourse to a group-selection idea. The jargon that we use is *teamwork* or *team play*. We're envisioning the cooperation as occurring in teams. We have further theories about how the teams are organized and what's needed in order to keep members of the team participating —and participating honestly. So we're very involved with understanding what the incentive structures would be to keep teams functioning as teams.

Host: Frankly, I see the connections religiously. Three years ago—in fact, this is how I met David Sloan Wilson—there was a conference organized by Russ Genet in Hawaii. It was the First International Conference on the Evolution of Religion. It brought together scholars from around the world, and there were about sixty (mostly academics) who were studying religion from a science-based evolutionary perspective. I was one of five evening keynote speakers there. The conversation we're now having would be really interesting to a lot of those people because what you're saying is attractive to me. I don't know enough about it—I've not read about it—so I'm sort of in this place of "Wow, I need to know more about this!" But I would like you to hypothesize: What does this say about our religious nature? How is it that teamwork, at

the level of groups, makes a difference in our lives and in our cultures? Can you make that bridge for us religiously?

Joan: Well, I would conjecture that religion and ceremonies, in particular, *do* function to coordinate our activities. The key element to teamwork as we're envisioning it—and this work has been with my students, Erol Ackay and Priya Iyer (who are now post-docs and have gone on [to other universities])—we've envisioned that teamwork involves two components: first, *acting together in a coordinated way*, and second, *acting toward a common goal*. You need to have both the goal and the coordinated activity in place.

What we're envisioning with animal teamwork is that, through these physically intimate associations—such as grooming or preening or sexual contact or calling back and forth—that all of these tactics keep the animals coordinated in their activity. More importantly, it lets them experience pleasure in the other's welfare. That's really key here. And that's because you can imagine two animals that are grooming each other: If one of them isn't happy, then the other one knows it, because they're feeling the other animal. Each is only happy when the other is happy. That, then, provides a pleasure-based incentive for acting to promote their mutual welfare. That's really key to this. And, of course, the fact that they're in close contact means they can have coordinated actions. I think the problem of coordination, which has had most of the attention in game theory accounts, is easier than the problem of getting the animals to be motivated to enjoy each other's welfare. That's where I think the pleasure element is particularly important.

If we get to humans, I think that a lot of the ceremonies that we have are almost obviously set up to get us working toward each other's welfare and working together. The role of pleasure isn't quite as conspicuous [in us] as it is in animals. In humans we would have more things like a philosophical commitment to the common good, and there's a more abstractness to it. But still, most people who participate in ceremonies actually do so with a feeling of joy. I mean, people stop going to church after awhile if it's no fun.

You find a lot of people who experience persecution in religious contexts—and they're the ones who drop out of church, really fast. If, on the other hand, it is a constructive community, then people keep going. I've never met anyone who was religious who became a person of faith because they were talked into it by some theological argument. I think everyone who is a person of faith (in the final analysis) *feels* good as a result of that activity—even though it might sometimes be uncomfortable, curiously enough.

I place a lot of emphasis on *feelings* in my conceptualization of teamwork and of cooperation or sharing. It seems to me that [feelings] go hand-in-hand with a lot of religious activity. I remember being on a vacation briefly in Bali a couple of years ago and looking at the intense quantity of religious devotions that people have there. And they're *all* doing this. They're in parades all the time. Even the gamelan music that you hear: it's not like American jazz where somebody will play a solo and then everyone will play together, and then somebody else will play a solo again. In the gamelan, they're always playing in a team. There's no singling out of individuals at any point. It's the same thing, I think, with their intense religious devotions.

These parades all the time, ceremonies all the time—50% or more of the day is taken up in these ceremonies.

Host: The first time I remember reading or hearing about anything like this was from one of my mentors in the late 1980s: Dolores LaChapelle. She wrote a book called, *Sacred Land, Sacred Sex: Rapture of the Deep—Concerning Deep Ecology and Celebrating Life*. That's a rather long title, but it was a fascinating book, in part because she helps the readers (she certainly helped me) have an understanding of why it is that our brains—our reptilian, mammalian, primate, and hominid/human brains—resonate so deeply with patterned behavior: with ritual, with song, with ceremony. Also, what it does to us in terms of bonding that it creates, and a shared *feeling*, as you say, of "we are part of one larger body." And so, I'm actually fascinated by what you're saying; it's reminding me of Dolores' book.

Joan: It sounds very similar.

Host: Joan, I want to invite you to come back to the title of this conversation, "Deconstructing Darwinian Selfishness." You talk about that in terms of some of your own research and your writing. I'm wondering if you could just tie us back into that theme.

Joan: Yes, I guess the final words I'd like to express are that the notion that evolution must lead to selfishness and brutality and a lack of empathy, and to relentless individual competition, is simply not accurate. That's not the way animals actually are, and it's not the way evolutionary theory actually works. People who *do* claim that are picking and choosing from evolutionary theory. People who emphasize selfishness are picking and choosing only one part of what the theory has to offer. And if people are concerned that evolution necessarily flies in the face of a Christian doctrine of love and mutual care and regard, *stop worrying*. It doesn't necessarily fly in the face of those important spiritual and Christian values. It's a mischaracterization of our science that so many of the New Atheists portray evolutionary inevitability as one of selfishness and relentless brutality.

Host: I'm not sure I read the New Atheists as doing that as a group. I happen to know all of them except Christopher Hitchens (*who died a year after this interview*). But I do agree with you, and wholeheartedly, that empathy and compassion and mutualism and care—these kinds of things are at the heart of the evolutionary process and at the heart of our nature. Two of the best books that I've read on that topic I read just in the last year: Frans de Waal's book *The Age of Empathy*, and Jeremy Rifkin's book *The Empathic Civilization*. Both I'd consider in the top, probably, 15 books I've ever read. (*Here is an over-the-top blog post I wrote on both of these books. And here is a helpful 10-minute RSA Animate video intro to Rifkin's book.*)

Joan: Good. Well, I'm glad you have found some silver lining in the New Atheists. That has escaped me. *[laughter]*

Host: I see them as playing a role in the larger body of life that's actually, I think, a really important one. Even though many of the New Atheists are attacking God and attacking religion, ultimately, I think that they're playing a prophetic role—that they're helping us, as religious people and as religious traditions, to evolve, to adapt to the evidence, and to not merely value ancient texts over evidence. So I'm able to think about what Richard Dawkins and Sam Harris and Daniel Dennett and Christopher Hitchens and PZ Myers and Jerry Coyne and the others are contributing *as* a contribution. I *do* see it as a contribution—even though I don't think exactly as they do. And I'm glad I'm playing a very different role in the body of life. Nonetheless, when I look down the road 20, 30, 40, 50 years, I think that the results of what they're doing will ultimately prove positive. We need a lot of different voices doing a lot of different things, playing a lot of different functions in this larger body for humanity as a whole to mature and move into our next part of this adventure.

Joan: *[laughter]* Well, that's nice and sweet. I think they would find that condescending, however. My opinion is that they're just dead wrong about their science and we should call them on it.

Host: Well, and I appreciate the fact that you have that [opinion]. And I'm not saying that I'm *right* in that. I'm just saying it's a useful stance for me to take, in terms of where can I value what it is they're doing and also critique it in whatever ways I really feel strongly led to critique it. For example, I think the New Atheists have an abysmal notion of God (as I've preached many times and wrote about in a sermon published in *Skeptic* magazine). The God that they reject deserves to be rejected because it's a caricature that's not accurate anyway. So there are lots of places where I differ, but I'm ultimately, I think, grateful for what they're doing.

And I'm also hugely grateful for what *you're* doing in countering [the New Atheists]—as are many of the other speakers who are part of this series. The New Atheists are best-selling authors and are now, sort of, "in the face" of religious people. I think that their in-the-face-ness is actually going to be a good thing for us religious people over the course of time.

Joan: Well, you're probably right. *{laughter]* It certainly has been what we've been dealing with since the time of Christ and before.

Host: Well, Joan, any last things that you'd like to share with our listeners in terms of projects that you're working on or new writings?

Joan: Just *The Genial Gene*. I have my hands full with that.

Host: When did that come out?

Joan: Last year.

Host: How has it been received thus far?

Joan: The philosophers are very interested. A lot of the biologists are vitriolic.

Host: Ah, yes...

Well, Joan, thank you so much for sharing your science, your experience, and your perspectives with us today on the leading edge of faith.

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