

Joan Roughgarden

“Deconstructing Darwinian Selfishness”

Episode 31 of The Advent of Evolutionary Christianity

EvolutionaryChristianity.com



Joan Roughgarden is professor of biology and geophysics at Stanford University. Her specialty is the evolution of social and sexual behaviors and mutualistic interactions, emphasizing the role of cooperation. Her two scholarly books on these themes are *The Genial Gene* and *Evolution's Rainbow*. Her popular book, *Evolution and Christian Faith*, is the topic of this conversation.

HIGHLIGHTS

One of the highlights of this conversation is **the way in which Joan Roughgarden responds to questions**—less from her own personal views as a Christian and more as **a biologist seeking to help religious people** find ways to responsibly **bring the findings of science into their faith**. Consequently, although a religious liberal herself, she has probed the Bible to find scriptural passages that can demonstrate—to even the theologically conservative—**why scientific findings are not in conflict with the sacred texts**. Some of the resolutions that she gently offers to fellow Christians are quite **innovative**. Accordingly, very few of the ideas and perspectives contained in this conversation are dealt with in any of the other dialogues of this series. For example, Roughgarden **portrays “Intelligent Design” advocates as being “spin doctors,”** and she will have nothing to do with them. But she enjoys reaching out in friendly ways to Christians who are authentically and openly literalistic about their faith, and she does this by recommending to them **particular Bible passages that are most congruent with modern scientific understandings**.

Another highlight of this dialogue is that, more than any of the others in this series, it offers **an inside look at the challenges of ideological assumptions within the scientific endeavor** itself. It is also one of the best episodes for considering both **the importance and the risks in using metaphors in science and in religion**—specifically, the tendency for a metaphor to later become concretized as real. Other topics substantially dealt with in this dialogue: discovery of **cooperative behaviors as driving forces in evolution**; whether the **New Atheists** are a help or a hindrance for evolving Christianity; the role of **pleasure** in supporting

sociality; **religion as an evolved support for human cooperation** at wider scale than instincts alone could provide.

SUGGESTED AUDIENCES

This conversation may be of exceptional benefit for anyone who thinks that mainstream science outright conflicts with the Bible—and who is troubled by such apparent conflict. It is also an eye-opener for religious liberals who do not personally require concordance between science and scripture, but who would appreciate learning novel approaches for explaining evolution in ways that can bridge to theologically conservative views. As well, any religious or secular audience who assumes that science is supremely an objective enterprise, free of ideological leanings and turmoil, will benefit from this inside look at a present-day debate within evolutionary biology: whether cooperation is possibly an even more significant driver of evolutionary change and success than is competition.

BLOG COMMENTS

Nic Paton says:

Joan's views contrasting Creationism and Intelligent Design were thought-provoking, especially in the sense that she prefers to talk to "up-front religious" Creationists rather than "sneaky lawyers trying to win on a technicality" ID'ers. Good advice to steer clear of science with those rejecting it, and to approach the problem via scripture. Excellent insight (I must read her 2006 book) that the basic ingredients for the evolutionary hypothesis are already in the bible: e.g., selection (breeding) and randomness. To this I'd add the Hebraic metaphor of journey (as opposed to the Greek static perfect Ideal) as an underpinning for an evolutionary reading of the biblical library.

Lastly, I like the fundamental alternative hypothesis of "the genial gene," and Joan's short history of natural selection (1860s) → genetics (1920s) → good of species (1970s) → selfish gene (1976) and beyond. Overall: a 5 star discussion.

Richard Powell says:

I've been waiting with real anticipation for this conversation after noting Joan's presence and courage as a speaker at the "Beyond Belief" conference. I was not disappointed. Her calm confidence and dutiful persistence in holding fellow scientists to the tenets of science is appreciated; and her faithful adherence to the same tenets inspires confidence in her assertions. I feel like I can listen to her with some relaxation because of her uncompromising insistence on careful thought and careful speech. I don't have to have my "unwarranted extrapolation" detector tuned too high. That faithfulness to the scientific method is perhaps her highest

credential.

When Joan was talking about cooperation and mutual benefit (as per *The Genial Gene*) she was careful to distinguish between selection at the different levels. I didn't actually follow it all, and will have to read the book in order to do so, but I appreciated that she made an attempt to convey the distinction and not just "dumb down" or spiritualize the point.

The role of church attendance as a type of behavior that functions in a similar way to grooming (or testing to see if something is pleasurable to others) was new to me and interesting. Perhaps I am pushing the analogy a little too much, but I think I heard Joan conjecture that church life might be one way we get motivated to enjoy each other's welfare. That is actually an almost poetic way to think of it. The idea that sharing a pleasurable activity builds cohesion is self-evident, except I hadn't really thought of it before! Maybe churches need to find a balance of extroverted and introverted ceremonies and practices. Now I am thinking of pleasurable activities I can suggest for my family and small groups.

KEYWORD TOPICS

Episcopal church (lack of conflict with evolution), **science** (as a "prayerful" or "worshipful" endeavor), **Teilhard de Chardin**, **God** (as creator, creative process), **Creationists** (how to productively talk with), **Intelligent Design** (criticism of), **Bible** (where congruent with science), **randomness** (in evolution, biblical support for), **evolution** (reasons for resistance to), **evolution** (history of its discovery), **Charles Darwin**, **scientism** (problems with and fear of), **cooperation** (its role in evolution), **interpretation** (of sacred texts), **neodarwinism** (its explanatory features), **empathy** (as naturally evolved), **genetics** (the missing piece in Darwin's understanding), **metaphor** (as unavoidable in both science and religion), **sexuality** (alternative evolutionary explanations of), **gender** (alternative evolutionary explanations of), **natural selection**, **sexual selection**, **social selection** (in contrast to sexual selection), **Richard Dawkins**, **George C. Williams**, **worldviews** (effects of on scientific theories), **group selection** (as discredited scientific theory), **multi-level selection theory** (as new evolutionary theory), **selfishness** (in evolution, **selfish gene theory** (criticism of), **David Sloan Wilson**, **behavior of animals** (its role in evolutionary change), **homosexuality** (in nature), **bonobo chimpanzees**, **social intimacy and pleasure** (as an impetus for the evolution of cooperation), **emotions** (their impact on evolution), **Dolores LaChapelle**, **ceremony** (importance of for human wellbeing), **values** (evolution as congruent with Christian values), **New Atheists** (as help or hindrance for the evolution of religion)

BIOGRAPHY

Joan Roughgarden received a Bachelor of Science in biology and a Bachelor of Arts in philosophy from University of Rochester in 1968, and a Ph.D. in biology from Harvard University in 1971. She has taught at Stanford University since 1972 and is Professor of Biology and Geophysics. In 1992 Joan founded and then directed the Earth Systems Program at Stanford, and in 1995 received the Dinkelspiel Award at Stanford for service to undergraduate education. She was elected a Guggenheim fellow in 1986, and a fellow of the American Academy of the Arts and Sciences in 1993.

Joan's current research focuses on the evolution of social and sexual behaviors and mutualistic interactions, emphasizing the role of cooperation, using game theory and the economic theory of the firm to develop alternatives to sexual selection theory and its corollaries. She has written about this subject in her recent books, *The Genial Gene* (2009) and *Evolution's Rainbow* (2004), which won a Stonewall Prize for nonfiction from the American Library Association. Her previous work includes investigations of the community ecology of Caribbean Anolis lizards, the coupling of oceanic and benthic processes in the population dynamics of intertidal invertebrates, and the theory of ecological economics. Joan has published more than 160 papers, and eight books including *Theory of Population Genetics and Evolutionary Ecology* (1979), *Anolis Lizards of the Caribbean* (1995), *Primer of Ecological Theory* (1998), and *Evolution and Christian Faith* (2006).

She is a theologically liberal Christian and actively helps religious leaders reconcile biblical passages with a current mainstream understanding of science — notably, via her book, *Evolution and Christian Faith*.

SUPPLEMENTARY VIDEOS

81-minute lecture on her book, *The Genial Gene* at a book-signing event.

http://fora.tv/2009/06/22/The_Genial_Gene_Joan_Roughgarden

Joan Roughgarden speaks (for 12 mins) at the “Beyond Belief” conference about her book, *Evolution and Christian Faith: Reflections of an Evolutionary Biologist*.

<http://www.youtube.com/watch?v=-gbFLml1uvM&feature=related>

SUPPLEMENTARY WEBPAGE

Listener comments to this audio can be found (and new ones added) at the following url. Joan Roughgarden substantially interacts with those posting comments on this page.

<http://evolutionarychristianity.com/blog/general/joan-roughgarden-mutual-pleasure-and-teamwork-in-evolution/>

QUESTIONS FOR REFLECTION AND DISCUSSION

1. **Why return to church.** Joan Roughgarden talks about how she “drifted away from church” while in college. She continues her story, saying,

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.

Question 1: *In your own faith journey, have you found the institutional church helpful in times of emotional need or for finding community? Please elaborate.*

2. **Scientific work as a form of prayer.** Joan Roughgarden says,



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 [above] 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.

Similarly, one of **Carl Sagan’s** famous quotations on the intersection of science and religion is quite similar to what Joan is saying here as a scientist. The astrophysicist Sagan wrote, **“Science is, at least in part, informed worship.”**

Question 2A: *When scientists use religious words, such as “worship” and “prayer,” to explain what the scientific endeavor means to them, what comes up for you? Do those words*

seem like an unwarranted transgression, or do they encourage you to consider the realm of science as a potential source for personal meaning and inspiration? Say more.

Question 2B: *Are there times in your own vocational or avocational pursuits when you too feel as if you are engaged in an endeavor best described by the use of religious language? Please elaborate.*

3. Talking with Creationists v. Intelligent Design advocates. One of the highlights of this conversation is the way in which Joan Roughgarden consistently responds to questions—less from her own personal stance as both a Christian and a leading scientist, but more **as a biologist seeking to help religious people find ways to responsibly bring the findings of science into their faith**. She says, “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.” She explains,

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.**

Question 3A: *How do you feel about Joan’s efforts to help more theologically conservative fellow Christians find scriptural reasons to be more comfortable with the discoveries and conclusions of science?*

Question 3B: *Did you appreciate her pointing out **the parable of the seeds** randomly falling off a cart? Joan spoke of that parable as an example of where the Bible can be read in support of an evolutionary understanding of nature—a process that does include **randomness**, and which some religious people find off-putting for that very reason.*

NOTE TO TEACHERS: *Because a total of seven episodes in this series put forth criticisms of the Intelligent Design movement, you might want to ask students how the critical arguments made by one or more of the following are distinct from one another: Joan Roughgarden, Denis Lamoureux, Karl Giberson, Ken Miller, Owen Gingerich, John Haught, and John Polkinghorne.*

4. **Worldviews and the array of scientific hypotheses.** Joan Roughgarden has published papers in leading scientific journals and has written a book, *The Genial Gene*, that challenge **the long-reigning paradigm** in biological science that sees **competition and self-interest** as the primary selective forces in evolution. Her **alternative hypothesis** is that much of the same data supporting competition and self-interest can be interpreted equally well (and sometimes better) by positing **cooperation and mutual benefit as the driving forces**. She is careful not to suggest in this interview that her hypothesis is true and the other is false. Rather, she advocates for scientists to **investigate a greater array of hypotheses**, and she cautions against allowing dominant ideologies to narrow the playing field. She explains,

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.

Question 4: *Did you find Joan Roughgarden's advocacy in this regard persuasive and important? Or is the topic, perhaps, too specialized for you to trust your own response?*

5. **The fact of evolution and its processes.** Joan Roughgarden talks quite a bit, and somewhat technically, about how the scientific understanding of evolution has developed since Darwin's time. While taking issue with some of the details of how biological evolution is thought to proceed, she nevertheless concludes, "**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."

Question 5: *When you hear statements from respected scientists that take issue with how the process of evolution actually occurs, does this make it more difficult to accept the fact of evolution—that there has been a long history of species births and extinctions and that the overall pattern of change shows only simplest forms in the beginning and greater diversity and complexity emerging, albeit sporadically, over the course of hundreds of millions of years? And*

*what about this interview: **does it deepen or weaken your sense that the fact of evolution has been well established in science?***

6. **The use of metaphor in science.** A core feature of theological debates in modern times is whether the Bible should be read literally or metaphorically. Joan Roughgarden talks about how this same problem arises in the sciences. In the 1970s **Richard Dawkins coined the term “the selfish gene”** to give a name to his proposal that natural selection is better understood as operating at the level of the gene than “for the good of the species.” Joan says,

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 is an accurate portrayal of evolution. Does evolution actually lead to selfishness and brutality, and to deviousness and diabolical competition, ubiquitously?

To counter the widespread assumption that biological evolution is driven by selfish, competitive, even brutal processes, Joan Roughgarden has not only developed a countervailing theory but used a provocative metaphor to label it. Her 2009 book on this topic is titled ***The Genial Gene***. **Here is the publisher’s description of the that book** on Amazon.com:

Are selfishness and individuality—rather than kindness and cooperation—basic to biological nature? Does a “selfish gene” create universal sexual conflict? In *The Genial Gene*, Joan Roughgarden forcefully rejects these and other ideas that have come to dominate the study of animal evolution. Building on her brilliant and innovative book *Evolution’s Rainbow*, in which she **challenged accepted wisdom about gender identity and sexual orientation**, Roughgarden upends the notion of the selfish gene and the theory of sexual selection and develops a compelling and controversial alternative theory called **social selection**. This scientifically rigorous, model-based challenge to an important tenet of neodarwinian theory **emphasizes cooperation**, elucidates the factors that contribute to evolutionary success in a gene pool or animal social system, and vigorously demonstrates that **to identify Darwinism with selfishness and individuality misrepresents the facts of life** as we now know them.

Question 6A: *Does this discussion of **the role (and challenges) of metaphor** within the practice of science itself affect your own **confidence in forming opinions** about matters that are still controversial in science?*

Question 6B: *Does this discussion of **the role (and challenges) of metaphor** within the practice of science **hold any meaning for you** on how you interpret the sacred texts of your own tradition?*

7. **Evolution v. Christian values.** Joan Roughgarden is a well-respected and leading advocate of a movement in evolutionary biology that is beginning to question the prevailing “selfish gene” theory, which emphasizes competition. Instead, Roughgarden tests in her laboratory and interprets the facts of nature in ways that elevate “**cooperation and mutual benefit**,” and also “team play,” as more important than “selfishness” and competition in influencing how animals that interact socially actually evolve. She sums up her scientific perspective this way:

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.

Question 7: *Has this exposure to a **gentler**, more “genial” understanding of the processes that drive evolution made a difference in your acceptance of, or enthusiasm for, scientific portrayals of how life evolved? Please elaborate.*

8. **Who, in science, to listen to?** Joan Roughgarden posed a question herself on the comments page of the EvolutionaryChristianity.com website that initially aired the whole series of dialogues:

<http://evolutionarychristianity.com/blog/general/joan-roughgarden-mutual-pleasure-and-teamwork-in-evolution/>

Q by Joan Roughgarden: What, if any, is the responsibility of theology and theologians to ensure the accuracy of scientific claims about nature, about humanity, and about the universe? I observe that discourse on the relation between science and religion proceeds from the premise that what scientists say is true is indeed true. The theological task is therefore to accommodate scientific truth. Yet, we know all too well that scientific claims are frequently revised, often dramatically.

Should theologians have a part in challenging the accuracy and correctness of scientific claims, or should they accept what scientists are presently saying as correct, and await any revisions coming from scientists, before revising their own theological reflections?

Question 8: *Building on Joan Roughgarden’s own question, How can religious scholars, clergy, and lay people know when a new theory offered in any of the sciences merits their attention? **Is it possible for nonscientists to learn enough to know whether a new theory, which might support one’s own religious preferences, is credible—or still just fringe?** (And what, if anything, is a downside with becoming enamored of a “fringe” theory?) What responsibility do members of the **clergy**, in particular, bear in being careful not to accept too quickly a new theory in the sciences that happens to support their particular theological views?*

Should theologians and religious scholars assist clergy in making those assessments, and how might they effectively communicate their recommendations?

NOTE: Joan Roughgarden's evolutionary hypotheses are not considered "fringe" science. They are new, novel, and alternative hypotheses well within the darwinian paradigm of evolution. Notably, her work along these lines has been published in the top scientific journals, which are generally regarded as trustworthy in giving no forum for anything as-yet "fringe."

9. The role of pleasure in evolution. Joan Roughgarden talks about how, in some social animals, a pair engages in far more instances of **mating behavior** than required merely to ensure fertilization. She then goes on to say,

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.

Question 9: *If Joan Roughgarden's "teamwork" hypothesis of **social selection in biological evolution** becomes widely accepted by other biologists as playing a significant role in the evolution of social animals—including our own **human evolution**—would this make the science of evolution more interesting for you to ponder, and perhaps more acceptable religiously? Please explain.*

10. How religious ceremonies contribute to evolutionary fitness. Joan Roughgarden says that in we humans,

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.**

Question 10: *Joan Roughgarden's positive regard for religion is something that actually supports human **cooperation**—and thus also supports the evolution of larger "teams" (such as nations) than would be possible in other social mammals. Does it excite you to learn that, in a*

very real sense, **religion might support evolution—rather than be challenged by it?** (Please discuss.)

11. **Feeling v. thinking.** Joan Roughgarden says,

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 feels good as a result of that activity**—even though it might sometimes be uncomfortable, curiously enough.

Question 11: *Does her assessment ring true with your own experience, and what you observe in others? Please elaborate.*

12. **The New Atheists—help or hindrance?** Joan Roughgarden speaks against the so-called “New Atheists”—the prominent scientists and philosophers who openly criticize religion. She says, “It’s a mischaracterization of our science that so many of the New Atheists portray evolutionary inevitability as one of selfishness and relentless brutality.” The host, **Michael Dowd, disagrees with her assessment.** He says,

I see the New Atheists 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. 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.

Question 12A: *What was your intellectual and your felt reaction to Dowd’s defense of the New Atheists?*

Question 12B: *What about the tone that Joan and Michael maintained during their exchange on this issue? They expressed opposing assessments of the New Atheists—yet Joan, in particular, responded graciously to the points raised by Michael. Did you notice, and perhaps appreciate, the **tonal quality** of their mini-debate on this issue? Does the tonal quality of their exchange invite you to pay more attention to your tone, as well, when engaging in dialogue on controversial or emotion-laden matters? Please discuss.*

13. OPTIONAL (AND FINAL) TOPIC FOR DISCUSSION: **Latent prejudices?**

Question 13A: *What is **your overall assessment** of both the ideas and the character of Joan Roughgarden? Is she someone you would value as part of your church community? Would you be supportive of this scientist and Christian being invited into the pulpit?*

Question 13B: *Would your assessment change if you were told that Joan Roughgarden was born Jonathan Roughgarden? In the introduction to her 2004 book, Evolution's Rainbow, she states that in 1997 she began her transition into a "**transgendered woman**."*

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