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The Prince of Evolution

Lee Alan Dugatkin on Peter Kropotkin,
Anarchism, and Cooperation in Nature

Eric Michael Johnson

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politics (with the goal of promoting a more cooperative society) was vitally important for the future of the human species. But he also lived during a time when disciplinary boundaries weren't so rigid and a naturalist could still have something valuable to contribute in the arena of political ideas. Do you think his project still holds any meaning in the twenty-first century?

Dugatkin: I absolutely do. I would argue that this is one of the many points that show Kropotkin's prophetic powers. In essence what we are seeing today, what people like E.O. Wilson called Consilience, is the bringing together of the sciences, social sciences, and the humanities with an underlying naturalist explanation for everything that occurs on the planet, including political interactions. The lines between people who are studying evolution, economics, political science, psychology, anthropology, etc., are slowly beginning to fade because people realize that the underlying theoretical framework for all of these disciplines is evolution. Kropotkin knew that even then. He was really the first person to show how consilience could be achieved and he showed it, not just to other scientists, but to anyone and everyone who would listen. And there were plenty of people that did.

tion in the heart of America's financial sector, do you think there is some truth to this assertion?

Dugatkin: Kropotkin would not have been at all surprised by what has happened in the United States over the last few years. He generally had a negative view of capitalism but, even more important, was his work on mutual aid in human evolution from early on through the medieval period. His research showed that over and over again people figured out a way to create small, interacting cooperative groups like the guilds in the Middle Ages. But the problem he found was that, as soon as these cooperative groups emerged, it immediately created selection pressures that favored parasites. These parasites would come in and suck up what they needed from individuals who were being good to one another and, eventually, cause the society to crumble. So, certainly, Kropotkin would not have been at all surprised by what has happened today.

I think this gets to the episodic nature of social change in Kropotkin's view. As soon as you establish a cooperative society, you immediately create these dramatic forces that favor cheating. The question of how to stop that was one that Kropotkin was obsessed with. He thought the prison system was a terrible solution to this sort of problem, that what it did was create more people that were even more parasitic when they came out because of the terrible conditions they had to deal with on the inside. But I don't know that he was happy with any particular solution that he came up with. He knew this was one of the big problems that was going to consistently have to be dealt with. But in his heart of hearts I think he envisioned that a properly conceived anarchist society with rules for curtailing this kind of cheating would work. What exactly those rules would be, I think that's difficult to know. He had some ideas but I don't think he was completely satisfied with any of them.

Johnson: In the nineteenth century Kropotkin felt that coming to a scientific understanding of community

Evolutionary biologist Lee Alan Dugatkin has made his career studying cooperation, so it makes perfect sense that the subject of his latest book would be an anarchist. In *The Prince of Evolution* Dugatkin tells the story of the Russian prince, evolutionary theorist, and political radical Peter Alexeyevich Kropotkin whose Darwinian theory of mutual aid was the first to argue that cooperation was an integral part of natural selection. Today, the quest to understand how cooperative behavior evolved is one of the hottest areas in the life sciences, though few researchers realize that many of their questions were first posed by Kropotkin more than a century ago.

"Kropotkin was not only the first person who clearly demonstrated that cooperation was important among animals," Dugatkin writes, "he was the first person to forcefully argue that understanding cooperation in animals would shed light on human cooperation."

Dugatkin's book [an excerpt of which has been posted at [Scientific American.com](http://ScientificAmerican.com)] is a precis on Kropotkin's life and work, an overview that highlights the common theme of mutual aid in both his scientific and political ideas. Some may be familiar with Kropotkin as the revolutionary theorist of anarchism, a political system in which people organize their own affairs at the local level without interference from an external government, but few are likely to realize that this "anarchist Prince" started out as a physical geographer and geologist whose work was celebrated around the world. The discoveries that Kropotkin made of glacial formations during the Quaternary Period in Russia were received with international acclaim and earned him invitations to join the Imperial Russian Geographical Society, the British Association for the Advancement of Science, as well as a Cambridge University endowed chair in geology (which he turned down because it came with the stipulation that he give up his political work).

The Prince of Evolution offers a tantalizing peek into the life and ideas of a man Dugatkin calls "one of the world's first inter-

national celebrities,” someone who filled auditoriums throughout Europe, England, and the United States with talks ranging from biology to anarchy to Russian literature. Kropotkin was a thinker whose ideas were so large that a single discipline could not contain them, and they were thought to be so dangerous that he was arrested multiple times and spent lengthy prison terms in Russia and France for communicating them. Part of what made him such a threat to the monarchs of Europe, Dugatkin suggests, was that Kropotkin refused to accept any authority that wasn’t based on scientific principles. He urged people everywhere to reject illegitimate tyranny and to use the tools of critical thinking and science to build a more equitable society themselves. As Kropotkin wrote in his *Appeal to the Young* (1880):

We need above everything to spread the truths already mastered by science, to make them part of our daily life, to render them common property. We have to order things so that all, so that the mass of mankind, may be capable of understanding and applying them; we have to make science no longer a luxury but the foundation of every man’s life. This is what justice demands. I go further: I say that the interests of science itself lie in the same direction. Science only makes real progress when a new truth finds a soil already prepared to receive it.

Lee Alan Dugatkin has likewise taken up this clarion call for science advocacy. As a Professor and Distinguished University Scholar in the Department of Biology at the University of Louisville in Kentucky, he has published eight books and more than one hundred scientific papers in such journals as *Nature*, the *Quarterly Review of Biology*, the *Proceedings of the National Academy of Sciences*, and the *Proceedings of the Royal Society of London*. He has also written for *Scientific American* [“How Females Choose Their Mates,” April, 1998; “Jefferson’s Moose and the Case against American Degeneracy,” Feb., 2011], as well as *New Scientist*, *BioScience*, *The Huffington Post* and *The Wilson Quarterly*.

that traits can benefit others at a cost to oneself was severely criticized, in many ways rightly so. But I think that Kropotkin was thrown out with the bathwater. I don’t think anybody in that selfish gene group really read Kropotkin. I’m fairly certain they didn’t.

Johnson: Kropotkin clearly seemed to be advocating an early form of group selection. But wasn’t Darwin often advocating this as well? There’s a well-known quote from his book *The Descent of Man* that “Those communities which included the greatest number of the most sympathetic members would flourish best, and rear the greatest number of offspring.” He goes on to argue how those groups would end up doing better than other groups, a textbook definition of group selection.

Dugatkin: Yes, this is the most famous group selection quote associated with Darwin. I did my work with researchers who developed some of this group selection theory, and they’re certainly very familiar with that quote. Darwin, I think, did believe that group selection played a role in structuring human societies. However, the amount of space that’s spent on group and community level selection is very small and it’s almost all in *The Descent of Man*. This is an argument that group selectionists and selfish gene folks have all the time. Darwin has a very Jefferson-like quality in this regard. Abolitionists and slave holders could both claim that Thomas Jefferson said “X” about slavery and therefore he’s really the founder of their movement. But Darwin certainly talked about group selection and Kropotkin picked up on it. He then expanded on it in ways that were much deeper than Darwin, but he could and certainly did trace it to Darwin himself.

Johnson: Kropotkin argued that communities, left to themselves, would emphasize mutual aid internally and he saw the feudal lords and early capitalists as parasites that were exploiting the community for their own personal benefit. After the blatant exploitation and corrup-

think epigeneticists would have to say about Kropotkin's ideas?

Dugatkin: I think the epigeneticists today would be pretty happy with Kropotkin. There are a small cadre of folks who think that the inheritance of acquired characteristics may play a role in evolutionary change among nonhumans. But when it comes to human cooperation I think everybody understands that both classic Darwinian natural selection but also what amounts to the inheritance of acquired characteristics drive the evolution of human behavior. It's a dynamic between cultural and genetic evolution. While most animal behaviorists today might dismiss the Lamarckian side of Peter Kropotkin as something that we shouldn't even be talking about anymore, human sociobiologists would be much kinder to him.

Johnson: In your book you write that "for more than 80 years--until about the 1960s--Kropotkin's ideas on mutual aid played a prominent, critical role in the study of behavior and evolution." By that I assume you're referring to the work of George C. Williams, William Hamilton, and John Maynard Smith who heavily criticized the concept of group selection and inaugurated what is sometimes referred to as "neo-Darwinism," best known through the selfish gene theory of Richard Dawkins.

Dugatkin: Absolutely. The birth of sociobiology and behavioral ecology in the 1960s is also the death of Peter Kropotkin's work within the animal behavior sciences. Until that point there were at least some people who were paying attention to Kropotkin's work, not enough, but some people were paying attention. This was happening particularly in what was called the Chicago School of animal behavior that included folks like W.C. Allee, Alfred Emerson, and their colleagues. They paid real attention to Kropotkin. When G.C. Williams and Hamilton, as well as Richard Dawkins and E.O. Wilson, came around it was the death knell for Kropotkin because the idea

Lee Alan Dugatkin interviewed

I had the opportunity to sit down with Dr. Dugatkin last week to discuss his latest project on the science of Peter Kropotkin and what we might learn from a notorious anarchist whose ideas continue to inspire and provoke to this day.

Eric Michael Johnson: One of the things that strikes me about Kropotkin's work is how he always saw the world through his scientific lens. He insisted that any important political philosophy needed to be based in scientific principles and he dismissed Karl Marx for that very reason. He even called Marxism a cult.

Lee Alan Dugatkin: Not only did Kropotkin think of Marxism as a cult but he also referred to Berlin as their Mecca. He has a number of wonderful quotes like that. Everything that he did from his work on biology and geology to his work on anarchy to his work on prisons or the French Revolution were all done through the prism of science. He made a point of arguing that one of the things that separated the anarchist philosophy from other political systems, including Marxism, is that anarchism was based on scientific principles, and specifically those principles derived from evolutionary thinking. Even though Marxism claimed to be a scientific discipline, it was not based on a biological understanding of the world at all.

One of the things that he despised about Marxism is that it was based on the idea of ultimate government control, whereas Kropotkin wanted no government shackles on anybody. He thought it was good that they wanted to distribute resources more fairly, but he didn't think the government should have that role. He thought that the distribution should take place without government and that it should happen more naturally. Kropotkin wasn't advocating a violent expropriation of resources, even though he was not particularly outspoken

against violence, but he himself didn't see violence as the way to get there.

Johnson: Kropotkin was also highly critical of the excesses of capitalism. However, as you point out in your book, he used the work of the economist Adam Smith to argue against the very competition that most people assume Smith was advocating. Why would an anarchist turn to the father of modern capitalism to make his case?

Dugatkin: Yes, it's a great question. Kropotkin saw the old Adam Smith and the young Adam Smith as dramatically different figures. The Adam Smith who wrote *The Wealth of Nations* was not somebody that Peter Kropotkin was particularly fond of for both political and philosophical reasons. But Adam Smith also wrote a book called *The Theory of Moral Sentiments* where he argued that empathy was the key to understanding human behavior. It was for this reason that people are good to one another. They undertake what Kropotkin would call mutual aid because they could see the world through the eyes of somebody else.

Kropotkin was enamored with that Adam Smith. But, for Kropotkin, Adam Smith didn't go far enough because he only focused on moral sentiments with regard to humans. Kropotkin began to think that this same empathy was what drove mutual aid in animals and he was convinced that it would end up playing a critical role in understanding animal cooperation as well as human cooperation. So he took up with Adam Smith, but only the Adam Smith who wrote *The Theory of Moral Sentiments*, not the Adam Smith who wrote *The Wealth of Nations* who he saw as a capitalist troublemaker.

Johnson: You've written a good deal about the role of imitation and behavioral traditions in a variety of species. How does this and the modern science of epigenetics relate to the way Kropotkin discussed the theory of biological inheritance proposed by Jean-Baptiste

Lamarck? Do you think Kropotkin's perspective would be entirely out of place today?

Dugatkin: Kropotkin, particularly towards the end of his career, became very interested in Lamarckian inheritance. This was the idea that acquired characteristics, traits that were gained during an individual's lifetime, could be passed down across the generations. I think he did this primarily because he was looking for a mechanism that could produce mutual aid extremely quickly. Kropotkin saw mutual aid emerging whenever environments got harsh, but this was happening at a time scale that was too quick to be encompassed by the slow and methodical pace of natural selection favoring some traits over others. He used Lamarck's inheritance of acquired characteristics as a mechanism that could still promote mutual aid with an evolutionary underpinning but at a much faster rate. Kropotkin saw almost all biological and political change as something that happened in spurts. When it occurred it would occur quickly and it would occur intensely. But then there would be periods where very little was going on.

Johnson: This sounds a lot like the theory of punctuated equilibrium that would later be proposed by Stephen Jay Gould and Niles Eldredge.

Dugatkin: Yes. This is sort of a political version of punctuated equilibrium. Kropotkin saw that there was an episodic nature to major political change that maps nicely onto the punctuated equilibrium view of biological change.

Johnson: And epigenetics? Kropotkin was a committed Darwinist and rejected the idea that physical traits evolved the way Lamarck proposed. But, as you point out, his theory of mutual aid was based in animal cognition and empathy. There has been a great deal of work recently, most notably by biologist Michael Meaney at McGill University in Montreal, that has identified non-genetic heritable changes in cooperative behavior that occur based on environmental influences. What do you