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**Peter Corning**

***Synergistic Selection:***

***How Cooperation Has Shaped Evolution and the Rise of Humankind***

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**Frequently Asked Questions (FAQs)**

1. **The title of your book, “Synergistic Selection,” is an obvious play on “natural selection.” How is it different?**

The title of my book refers to a sub-category of natural selection. It encompasses the many cases in nature when two or more genes, or parts, or organisms cooperate, and, because of their synergy, they form a single “unit” that has a competitive advantage.

1. **So, how would you define the concept of synergy for a layman?** Many people are familiar with the expression, “the whole is greater than the sum of its parts.” An often-cited example is water, where two gases combine to produce a liquid. In the natural world, synergy refers to the unique combined effects that are produced by cooperation between two or more genes, parts or organisms. A classic example is lichens, where various kinds of fungi and cyanobacteria (or green algae) with different capabilities form symbiotic partnerships. Their joint capabilities give them a competitive edge.
2. **You claim that synergy has played a key role in evolution. Could you explain?** One of the most important trends in evolution over the past 3.8 billion years – from the origins of life to human societies in the 21st century -- has been an ever-increasing complexity, and this has been driven by increasingly powerful synergies. “The arc of evolution bends toward synergy.”
3. **How does this theory differ from the standard Darwinian theory, or the “selfish gene” model of evolution?**

The so-called “modern synthesis,” commonly known as the “selfish gene” model of evolution, is focused on competition among individual genes. It is the view that evolution is driven by what a particular gene can do, or not do, in the environment. What I call the “Synergism Hypothesis” shifts the focus to the interdependent cooperative effects produced by two or more genes, or parts, or individuals, and how they may be favored in evolution. It could be called competition via cooperation. There are still many traditionalists in evolutionary biology who adhere to a modernized selfish gene model, often referred to these days as “inclusive fitness theory.” A colleague of mine calls them the “priesthood.” It is normal and healthy for different scientific theories to be challenged and debated. But science also respects the facts and demands evidence.

1. **This theory was first proposed back in the 1980s. Why has it taken so long to be recognized?** There are tides, and tide changes in science, just as there are in politics and in our broader culture. Back in 1983, when my first book on *The Synergism Hypothesis* was published, evolutionary theory was gene-focused and there was little interest in the problem of explaining complexity in evolution. The very word synergy was unfamiliar to many biologists. But over the past two decades, complexity has become a major theme, and synergy is often studied and reported by biologists these days. So, the tide has finally changed for this theory.
2. **Why is your latest book being hailed as a major contribution to our understanding of evolution?** A major sea change has been occurring recently in evolutionary biology, with a shift away from a reductionist, gene-centered approach to a more inclusive framework that recognizes many different sources of causation at different levels, including synergy. A search has also been underway for a unified theory of complexity. The Synergism Hypothesis provides just such a general, unified explanation.
3. **What would you say the past 2 million years or more has taught us about ourselves as a species on the role of synergy in human evolution?**

I have developed an extensive argument for the idea that human evolution -- going back perhaps even to our australopithecine ancestors of five million years ago -- was shaped by an entrepreneurial process that involved the development of new forms of social cooperation and synergy. I call it the “self-made-man” scenario. For example, our earliest ape-like ancestors could not have come down from the trees and become successful ground foragers without cooperation in collective defense against the many other large predatory animals in their environment, probably with the help of crude digging sticks as defensive weapons. The development of cooperative big game hunting by our *Homo erectus* ancestors of about 2 million years ago was an equally transformative behavioral innovation. Synergistic cooperation and innovation have been the twin hallmarks of our evolution.

1. **How do you envision synergy as providing a road map to the future for our species?** Just as cooperation and new forms of synergy have been the key to our past success as a species, so too a positive way forward will depend on innovation and cooperation (and new synergies) on a global scale. The alternative will be growing political conflict and social chaos, horrific violence and human suffering, and even wanton self-annihilation – not to mention the destruction of the biosphere (and our life-support system) as we know it. Incremental changes are not enough. There must be a major transition based on the recognition that cooperation can produce synergy, and synergy is the way forward. Cooperation is not an end in itself, or something we do out of kindness -- for the most part.  It serves our self-interest because together we can do things that would not otherwise be possible.  That’s what synergy means.

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