

Beyond Biotechnology: The Barren Promise of Genetic Engineering

By Craig Holdrege and Steve Talbott
The University Press of Kentucky, 2008, 272 pgs.

Review by John Harris Beck
from Rudolf Steiner Library Newsletter #45

Beyond Biotechnology is a remarkable book. Its form is artistic, leading us skillfully from one worldview into another, and it is saturated with observations and ideas that it juxtaposes thoughtfully with the prevailing ideas of genetic engineering and technological natural science. Parts of it could be read to small children (the portraits of the cow and the sloth), teenagers could grapple profitably with most or all of it, and adults of a naturalist, philosophical, or sociopolitical bent will find it wisely informative.

Context is honored in this collaboration between Craig Holdrege and Steve Talbott, both of the Nature Institute in Ghent, New York. Craig is well known for observational biology, as is Steve for sober, insider assessments of our technological environment. With the blunt subtitle, "The Barren Promise of Genetic Engineering," their book works through layers of context to show us, with never a raised voice or shrill note, how bankrupt this latest technological driving force and supposed hope of our economy really is. However, the "beyond" of the book's title is the authors' ultimate goal. Overcoming the limitations of a hard-driving mechanistic approach to nature and its organisms means initiating a different kind of encounter. Holdrege and Talbott give us confidence that coming to know our fellow beings on this living planet will not only be good for our souls, but can foster better human nutrition and healthier environments.

The first chapter acknowledges, as it should, the sheer technical accomplishment of the vast uniform acres of corn on our plains. Then it brings us up short with the sentence: "Actually, it is difficult to find much of nature in those cornfields." The authors show us how, in technological agriculture, nature is pushed aside and the face of the earth, the landscape, is being transformed into a "machine-scape." (It could almost be one of those 1950s science-fiction food production airlocks on the moon! How did the earth, rather than the moon or Mars, become such a hostile environment, to be worked against, not with?)

A series of short essays addresses obvious questions like "Is biotechnology good for the environment?" with far from obvious insights, such as "the continuing stream of alien [engineered] genes" from the biotech companies—that is, *in the plants*—will themselves become "the ultimate uncontrollable pollutants." Already at the end of chapter one the viability and

possible competitive advantages of complex, ecological approaches to agriculture are clearly established.

But what about all the good that can come from these unique new crops? Chapter two deftly takes up—and then apart—the "golden rice" initiative, which aims to engineer rice plants to carry beta-carotene in the normally white part of the rice kernel. Offered as a major humanitarian initiative, this project once again fails to ask questions and explore contexts, so its altruism ends in tatters for all sorts of reasons—cultural, nutritional, and health. I'm reminded of the unexamined spirit in which Thomas Friedman of the *New York Times* wrote in the immediate aftermath of the 1999 "Battle of Seattle" that "trade is good for everyone," as if repeating the Golden Rule. This golden rice project expresses its benevolence with the same comic book naïveté, just coincidentally providing a public relations tool for the biotech industry.

From this one project the question is enlarged: "Will biotech feed the world?" It takes not Mali or Bangladesh as a starting point, but the United States, where the biotech presence is overwhelming and food exports are already enormous. In our country, according to the U.S. Department of Agriculture, 35 million people did not always have an adequate supply of food in 2004. The authors make one point loudly and clearly: "even if the wishful thought that biotechnology could increase food production in developing countries became reality, this is not the same thing as providing people with food.... Looking at a rich country like the United States...dispels the illusion that producing more food alone will feed more people."

From this crucial social observation the view is extended to the context of global development, concluding that the focus of an ecological view "is not on individual causes but on orchestrating the whole system," and that no one fixed model can work globally because local conditions are always interwoven with both problems and their solutions.

"We label orange juice, why not genetically modified food?" The FDA's refusal to allow labeling of GM foods is dissected with the same firm, quiet, penetrating attention that creates the mood of the whole book. While we might like to yell and scream, *Beyond Biotechnology* wants to lead us somewhere more appropriate to our human nature and capacities.

Part 2 dives into the gene question proper. Did you know that a "gene" is more an abstract concept than a definite, practical, and instrumental object? Quoting geneticists and historians of science, the authors present information that is common knowledge among biologists, yet completely contradicts the public image of genetics. For example, "The more molecular biologists learn about genes, the less sure they seem to become of what a gene really is." "The gene is no longer a fixed point on the chromosome...producing a single messenger RNA." We hear about split and moveable DNA sequences, edited transcripts, nested genes. "Rather than ultimate factors, genes begin to look like hardly definable temporary products of a cell's physiology."



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Speaking for themselves, Holdrege and Talbott summarize: “[T]he popular usage of the term [gene]... simply does not coincide with biological reality.” And from here begins in earnest their work to awaken us not to alternative fixed ideas, but to “learn[ing] to consciously swim in and adapt ourselves to...the fluidity and dynamics of the organic world.”

Each chapter of the continuing saga is concise and very rich. Multiple cultural, social, and ethical strands are interwoven, appearing and reappearing in the evolving context with growing significance. The social question of science education (or mis-education); the human genetic question (as in modifying one’s offspring); the history of “misdirection surrounding the gene” (i.e., social manipulation and propaganda); genetics as analog of conversation and poetry—this wealth of insights and questions flows beautifully, and invites multiple readings.

The third part of the book unfolds the alternative worldview that is in fact much truer to the character of the world than the triumphal mechanics that so often hypnotizes us. A graceful short study of the cow is titled “Organism or Bioreactor?” The authors ask us to take responsibility for which point of view we choose. The “separating of the sheep from the goats,” if I may inject that ancient metaphor, finally appears in the chapter honestly titled “The Forbidden Question.” That question, posed to all animals, all species, and to nature itself: “Is Anyone There?” Here we begin to experience Goethe’s way of taking nature in and letting it unfold its ideas in us, rather than projecting ideas onto it.

Part 4, “Science Evolving,” is an introductory textbook in brief for sensitive, contextual, holistic, Goethean science. The chapter titled “The Language of Nature” is Steve Talbott’s capable effort to show the drastic one-sidedness of natural science as it has developed. He notes his debt to Owen Barfield and works toward his goal within Barfield’s (giving credit to Coleridge) polarity of exact versus expressive communication. The final chapter is Craig Holdrege’s “Delicate Empiricism”; the phrase is Goethe’s, and by the end we understand it. To generalize, the science that Talbott has analyzed, releasing it from its thrall to abstract logic and measurement, is now invited by Holdrege to go in a new direction.

Published as part of “Culture of the Land: A Series in the New Agrarianism” from the University Press of Kentucky, *Beyond Biotechnology* is solidly in the mainstream of enlarged socio-cultural thinking. It will reach many people, and give the more open-minded some new ways to work forward. It deserves a long, strong ovation and much promotion by word of mouth and email.

It’s interesting to note that this book comes out in the same year that the Threefold Educational Foundation in Spring Valley, New York, celebrates the 75th anniversary of anthroposophical summer studies in their community. The biodynamic lectures Ehrenfried Pfeiffer gave there, and the zoological-morphological studies led by Ernst Lehrs, initiated a lifetime ago, would appear to be seeds that have found, in time—and in this book—fertile soil.

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