

Jones's answer in "The Prospect of Personalized Medicine" (Chapter 11) is pretty clearly no. Despite hopes that pharmacogenetics would allow for the targeting of drugs to those individuals who would benefit, the complexities of drug metabolism mean that few genes have proved decisive in drug administration. Trial and error is still one of the standard techniques for determining the effectiveness and best dose of a drug for a given individual.

Part Three, "Genetics in Human Behavior and Culture", is the most wide-ranging. In fact, some chapters seem only loosely related to genetics. Two chapters stand out as examples of how genes have come to assume an unwarranted position in the larger culture. Susan Lindee describes direct-to-consumer (DTC) genomic analysis in Chapter 13, "Map Your Own Genes". In a revealing story she relates how three major DTC genetic testing companies provided opposing health interpretations of the same individual's DNA profile. William Thompson tells a similarly troublesome story in Chapter 15 entitled "Forensic DNA evidence: The Myth of Infallibility". Thompson chronicles numerous cases in which DNA evidence has been based on the wrong sample or a contaminated sample leading to misinterpretations, all because of the belief that DNA is exempt from the problems that plague other investigative techniques.

In Chapter 14, "Creating a Better Baby," Shirley Shalev appears to attribute a desire to genetically choose our offspring to our increasing understanding of genetics. But it is not clear if the choice reflects an increase in genetic knowledge or the increasing investment parents are directing toward a decreasing number of offspring. Finally, in Chapter 16, "Nurturing Nature," Mae-Wan Ho reviews the tale of Micheal Meaney's pup-licking rat mothers and how genes are expressed in their offspring without adding much new. It is a wonderfully instructive example of the critical role of the environment in gene expression and phenotypic development, but the chapter does little to elaborate on the implications of these findings for understanding a potential human equivalent.

In the concluding chapter, Jeremy Gruber presents a thoughtful overview of the issues created by the genomic revolution. He suggests that the key issue is not so much the expense of genetic information, but how poorly equipped we are to make sense out of the overwhelming amount of data now available. It is a point that seems to get lost in the enthusiasm for genomics, but cannot be ignored by the researcher. In order to know what we do know, we must always be aware of what we do not.

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Seeds, Science and Struggle: The Global Politics of Transgenic Crops. By Abby Kinchy. xviii + 220 pp. Cambridge, MA: The MIT Press. 2012. \$44.00 (cloth), \$22.00 (paper).

Transgenic crops recently made news headlines once again, this time when an Oregon farmer discovered geneti-

cally modified wheat growing in his fields (Wines, 2013). The mysterious wheat, last field-tested nearly a decade ago, was an unapproved, experimental variety developed by Monsanto to resist its Roundup herbicide. Regulators downplayed concerns about food safety while environmental groups criticized genetic contamination, and US farmers worried that global markets would reject potentially tainted grain exports. Meanwhile, comedian Stephen Colbert satirized Monsanto's "amber waves of Franken-grain" as an apparently immortal "zombie wheat... *the return of the walking bread*" (The Colbert Report, June 5, 2013).

Jokes, of course, often reveal anxieties about the current social order. In a timely and welcomed contribution, *Seeds, Science, and Struggle* examines the controversy surrounding such "genes out of place," focusing on pivotal episodes in Mexico and Canada where seed mixing or pollen drift caused unexpected transgene flow and subsequently sparked energetic social activism challenging agricultural biotechnology. Based on these two case studies, Abby Kinchy, a sociologist with the Department of Science and Technology Studies at Rensselaer Polytechnic Institute, argues that public debate about transgenic crops has been constrained by regulatory models grounded in "scientific risk management," which privileges narrow technical issues such as health and environmental impacts at the expense of social and economic concerns. Opposition to biotechnology, she argues, is motivated only in part by the actual or perceived risks of technological change. Instead, opponents challenge the social organization of agriculture and food production, the "global agri-food system," which Kinchy maintains has been shaped by international trade rules and other policies that favor large-scale, industrial-style farming and multinational corporations such as Monsanto. Those who promote alternative models of socially just and environmentally sustainable food production, however, find their voices marginalized within the systems of risk management that inform biotechnology policy and decision making.

The elevation of risk management as a basis for regulatory decision making, argues Kinchy, has anchored the "scientization" of public debate, by which she means "the transformation of political conflict... into a debate among scientific experts, ostensibly separate from the social context in which it unfolds" (p. 25). One consequence has been to severely restrict what issues are discussed and who is allowed to participate in decision-making processes. The biotech industry, for instance, routinely discredits its critics as "uninformed," "anti-science" or as "politicizing" scientific discussion. Far from being neutral or benign, however, the scientization of debate has paralleled agricultural reforms premised on free markets, free trade, and extreme intellectual property rights, all of which have enabled an extraordinary concentration of corporate power in global seed markets. Multinational corporations clearly stand to benefit by framing biotechnology debates in narrowly technical terms that disguise their interests and reinforce this economic system.

As Kinchy shows in her superb case study on Mexico, the scientization of public debate has influenced the strategies of social movements that question biotechnology and seek to defend alternative farming practices. The discovery of transgenic maize in Mexico in the early 2000s, a country where maize originated and where transgenic varieties had not been approved, set off international debate and fueled a local "defense of maize" movement. Coming in the wake of the North American Free Trade Agreement, which

imposed free-market agricultural reforms that radically undermined rural livelihoods and autonomy, activists framed the contamination as a symptom of an undesirable socio-economic system. With limited opportunities to influence national regulatory policy, maize activists cultivated alliances with international scientists, “externalizing” the struggle over transgenic maize beyond Mexico. Building from previous scholarship on transnational advocacy, Kinchy coins the term “epistemic boomerang” to describe how local groups “go outside normal political channels to appeal to scientists, hoping to mobilize scientific research in support of their social goals” and to pressure national policymakers from above (p. 51). Maize activists utilized scientific expertise as a crucial resource and worked to expand the boundaries of what counts as legitimate knowledge in biosafety risk management, including claims about socio-economic impacts and the cultural meanings of maize among rural communities. While maize activists adopted the dominant language of risk management, they also engaged in their own civil society monitoring, a form of citizen science which simultaneously served to build awareness and mobilize supporters.

Kinchy compares the maize movement in Mexico with a legal controversy in Canada that has become an enduring reference point in debates about biotechnology. In 2004, Monsanto won a lawsuit against Percy Schmeiser, a farmer that Monsanto sued for violating the company’s intellectual property rights by planting Roundup Ready transgenic canola. Monsanto’s canola had contaminated Schmeiser’s fields from neighboring farms, but the Canadian Supreme Court ruled that Schmeiser, who knowingly saved and cultivated the variety, was guilty of using Monsanto’s patented genes. While this particular case has already received ample scholarly attention, Kinchy shines light on the relationship between social movements and law, examining efforts to expand public scrutiny of biotechnology through legal mobilization and to use the legal system as an avenue for social change. Despite Monsanto’s legal victory, this controversy has encouraged widespread discussion about the seed-saving rights of farmers and the consequences of patents that allow forms of ownership over self-replicating organisms, triggering further legal disputes. A class action lawsuit against biotechnology companies in Canada maintained that transgenic contamination poses an economic threat to organic farmers by undermining their access to export markets, where consumers reject products contaminated with transgenes.

“Zombie wheat” aside, the recent controversy in Oregon reminds us that genes out of place will continue to raise questions about the unexpected impacts of agricultural biotechnology, many of which are downplayed by current risk management frameworks. Kinchy not only provides insight into the social conflicts that will undoubtedly unfold, but a roadmap for those seeking to expand the boundaries of debate and build equitable and sustainable alternatives to corporate-controlled food systems. Beyond its timeliness, the book is well-organized and refreshingly readable. Diverse audiences will find it accessible, including students in upper-level undergraduate classes and specialized graduate seminars. Given the subject matter and approach, the book is appropriate for a range of courses addressing food politics, environmental studies, science and technology studies, ethics, social movements, and globalization.

LITERATURE CITED

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Living Color: The Biological and Social Meaning of Skin Color. By Nina G. Jablonski. Berkeley, CA: University of California Press. xiv + 261 pp. 2012. \$29.95 (cloth).

The title of Nina Jablonski’s book nods at the vital and kinetic natures of its subject. “Living Color” is the concept that skin color is a composite of biological and social constructions, reified by histories of bias, yet still fluid in meaning. Despite examining a subject already popular in scholarly and lay discourses, Jablonski’s creative framework provides fodder for new considerations of color and inspiration to curtail color-based discrimination. Meanwhile, her ability to convey complex topics in plain language and with appropriate supporting examples makes this volume of interest to expert and neophyte readers in the subject.

In *Living Color*, Jablonski weaves two disparate evolutions of skin color into one examination of its meanings throughout history. The first half of her book dedicates itself to the biological evolution and functionalities of skin color. The second half details the socio-cultural perceptions and trends that continue to shape understandings of color. Yet its prevailing message is that racial prejudice is a historical error that can be corrected. As Jablonski writes, “Understanding all of the different meanings of skin color in our lives may help us as a species eventually to move beyond skin color as a label of human worth and to see it instead as a product of evolution that once caused great misery” (p.5).

Throughout Part 1, Jablonski distills skin color’s physiological importance and functionality into bite-sized explanations, easily legible to the untrained student. Her study grounds itself in descriptions of skin color’s determinants including melanin, Vitamin D production, Ultraviolet rays, genetic mutations and migration, while concurrently highlighting the natural selection associated with those variables. The author ornaments her analyses with examples of the evolution she describes, beginning with early *Homo* species of two million years ago, followed by populations of equatorial Africa, Scandinavia, Melanesia and the Arctic Circle. In Part 1’s closing chapters, Jablonski focuses her investigation on the correlations between color, gender and health, reinforcing that skin color is a dynamic entity crafted by the interplay between genetics and one’s environment.

The book’s second part uses the lenses of history and social evolution to provide a longitudinal examination of the socio-cultural meanings and prejudices associated with skin color. Jablonski commences by explaining the drivers