Living Capital and the Quantum Ethnography of Spider Goats

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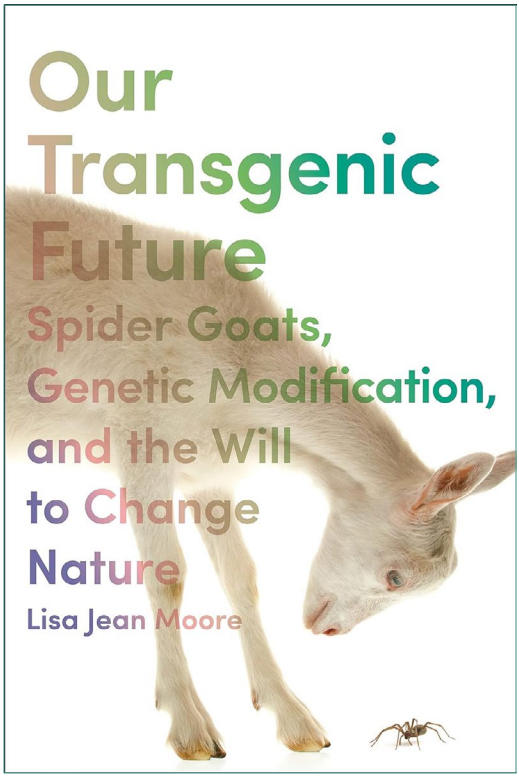

Review of:
Lisa Jean Moore. *Our Transgenic Future: Spider Goats, Genetic Modification, and the Will to Change Nature*. New York: New York University Press, 2022. xviii + 214 pp. 23 b/w illus. $89.00 (hb), $30.00 (pb).

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Transgenic organisms destabilize boundaries. Insulin-producing bacteria, pesticide-resistant soybeans and cancerous mice are among the products of genetic engineering techniques that blur the lines between microbial, plant and animal species that have taken millennia to evolve. At once living organisms and products of human ingenuity, transgenic beings trouble the sacred boundary between the natural and the artificial, confusing the science of molecular biology with its technological application. Political boundaries are also destabilized as radical environmentalists and religious conservatives find common ground in their resistance to the genetic engineer's violation of the purity of nature. Genetic engineering creates new assemblages of humans and nonhumans and, in the process, puts under the microscope our social theoretical frameworks. No wonder that these living products of technoscience have received so much attention from scholars in animal studies, science and technology studies, and cultural studies, those fields that aim to cross the conceptual boundaries dividing the disciplines.

In *Our Transgenic Future*, Lisa Jean Moore explores the destabilizing effects of goats genetically engineered to produce spider silk in their milk. Lighter and stronger than steel, the silk has potential applications in everything from medical sutures to bulletproof vests. Following in the science studies tradition of Bruno Latour and Donna Haraway, Moore uses ethnography and thick description to explore the complex and contradictory ways that technoscience works within the context of neoliberalization, rationalization, and the disenchantment of nature. She travels to a Florida forest to collect spiders, to an Idaho farm to meet and milk the transgenic goats, and to the labs where the R&D and purification of the spider silk takes place. The primary data source is a series of interviews with various scientist-entrepreneurs involved in the creation and use of the goats. These are supplemented with her own photographs of the field sites, cartoons, and personal conversations with family members and friends. Eschewing positivist objectivity, Moore places herself at the centre of her analysis, and her biography and immediate impressions in the field are interwoven throughout. "My observations are an epistemological and methodological move toward an even more micro,

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almost quantum, level," she writes, "where my interpretation included feelings, discussions, relationships, affects, and sensations" (14). She makes her methodological choices clear in the beginning and never shies away from the difficult theoretical, political, and personal questions she faces along the way.

The first chapter introduces the orb-weaving spiders whose silk ultimately links the complex set of human and nonhuman actors encountered throughout the book. For context, Moore provides a description of the spiders and identifies the various actors who have long recognized the military, medical, and other commercial applications of their silk. But it's really during the spider-collecting expedition and her interview with an entomologist that the analysis comes alive. Moore's description is vivid as she comes to appreciate the beauty of the spiders and realize the "selective speciesism" (33) that shapes both animal studies scholarship and animal welfare policy in prioritizing the cute and cuddly. She finds kinship with the spiders as a woman, mother, and feminist scholar and her encounter with them raises questions concerning patriarchal oppression, as well as her own experience with artificial insemination. Yet, it also raises difficult ethical questions as she is "left to consider how humans' domination of spiders, at least in this collection expedition, dislocated and deprived female spiders of their typical lived experience" (47). While critical animal studies often displays this tension between feelings of kinship and concerns with domination, Moore's encounter with the creepy and crawly allows her to explore it in refreshing and often surprising ways.

The spider goats make their appearance in the book's second chapter. After a brief history of the development of the goats, we are transported to the farm. Moore's interviews are particularly effective here in revealing the tension between the "emotional engagement" and "cognitive detachment" of those who must care for creatures whose lives are subordinated to human interests, and who are ultimately killed and disposed of when they become obsolete. But Moore struggles with her own feelings and ethical judgements as well. Despite the empathy she feels for goats whose lives are so

limited, and whose offspring are taken from them, she realizes her vision of goat liberation is informed by patriarchal assumptions around what is "natural" for (human) mothers. And despite a "critical sociological" reflex to regard science and technology as domination, her attitude toward her human subjects turns out to be no less complicated. "They were not cavalier or unethical people," she writes. "They were open and honest in front of me, patiently explaining every detail of their work. And still I couldn't shake how the clinical measurement of a goat's worth was the spider silk protein in her milk. How could I represent these people without my own judgements seeping out?" (94–95). These kinds of questions abound in the book and Moore faces them squarely and offers no easy answers.

This commitment to asking difficult questions continues in Chapter three when Moore locates the spider goats within their political economic context. She begins with a brief overview of the science of transgenics, using a conversation with her daughter to covey the technical details in a user-friendly way. She comments on corporate science and neoliberal capitalism—as well as on Weberian notions of rationalization and disenchantment of nature—and it's in relation to these larger-scale social processes that she begins to account for what is unique about the spider goats. "While previous human–goat interactions involved a co-constituted history of entanglements, goats have become useful to humans not as goats. The goats are now a system of production, making something entirely not of the goat but the spider silk protein desired by scientists (and the market)" (102). Yet, despite her attention to broader political economic structures, Moore avoids regarding them as monolithic. There are underlying tensions and contradictions at every turn that are revealed most clearly in her interviews with those who must reconcile a concern with the goats as "sentient creatures and a professional need to think of them as machines" (114). This machine metaphor proves in the end to be a central theme of the chapter as Moore effectively locates the spider goats within a hyper-rationalized form of capitalism where life itself becomes harnessed as a means of production. The disciplinary boundary between animal studies and political economy is destabilized in a particularly stark way here as she confronts the spider goats as living capital.

In Chapter four the spider silk reappears, only now as a product of technoscience intended for the market. Moore's central concern here is uncovering the human motivations underlying the creation and use of the spider goats. While aware of the drive to accumulate profit and the market pressures of capitalism, she wants to avoid reducing human desire to an effect of these. She assesses the value of psychoanalytic theory in this regard, which she considers a "modality of thinking through human motivations beyond commercial opportunism" (137) and a way of uncovering "underlying primitive agonies that motivate innovation" (139). Ultimately, Moore is ambivalent, convinced of the power of a Marxist critique in highlighting the role of capitalism in motivating innovation, but unwilling to reduce technoscience to such motivations simply because her interviews reveal a more complex narrative. "I am not trying to skirt a Marxist critique," she concludes, "and despite the obligatory 'everything is driven by profit' moral to the story, I do see how human workers (lab techs, herdsmen, scientists, me) make their work meaningful, even if it is driven by the pursuit of capital" (151). While there is something of a false dichotomy here in the notion that a focus on capital is necessarily contrary to the notion that workers "make their work meaningful", there is no question that such meaning has often been neglected by political economists and Moore makes a valuable contribution to labour process analysis in this regard.

Our Transgenic Future demonstrates the value of ethnography to science and technology studies, and to a critical social science more generally. There is a feeling of discovery and wonder throughout the book as questions are raised on the fly. In place of discreet and stable things, Moore highlights processes and relations. "I take all these different pieces—spider legs tickling my forearm, math equations handwritten by my daughter, plastic tubes shooting out modified milk, baby goats' incessant cries—and put them in contact" (149). Processes of capitalism and rationalization are ever present, but these are messy, lived experiences that are always contradictory. But it's perhaps the contradictory experience of Moore herself that is revealed most effectively in this quantum ethnography of spider goats as she faces the many destabilizations she

encounters in a self-reflexive way, questioning her assumptions as sociologist, feminist and mother. There are insights both highly philosophical and deeply personal on every page, all conveyed in an engaging style.

Of course, ethnography conducted at this quantum level must always sacrifice a detailed examination of large-scale social transformations. To Moore's credit, these transformations are present in the form of the Anthropocene, late capitalism, danger capitalism, the risk society, neoliberalism, Fordism/Taylorism, and rationalization, to name a few; indeed, the title of the book itself conveys a desire to derive big conclusions about "our future" from an ethnography of spider goats. But there is little sustained attempt to explain these processes or draw out the role that the spider goats play in them. Moore suggests in the introduction that the spider goats provide "new opportunities for me to comment on emerging science, technology, capitalism, feminism, maternalism, reproduction, ethics, queerness, and animal studies" (26), and there is indeed commentary on all of these and more. But the book is not a rigorous account of the significance of the spider goats for the broader social transformations she identifies.

Similarly, Moore spends little time drawing out the theoretical significance of her work for the scholarly traditions mentioned throughout the book. She draws on science studies, animal studies, feminism, and others, but we don't ever really find how her quantum ethnography of spider goats contributes to or challenges them. She often alludes to the limitations of "critical sociology", but this tradition remains undertheorized. "It is easy for me," she suggests, "to slip into an automatic critical sociological drive to expose this evil apparatus that flattens the human spirit and alienates us from our species being" (107). Is this a caricature of the Frankfurt School? We can't be sure. But given the fact that Moore appears to consider herself part of this tradition, we might expect a more nuanced account of its limitations and how her ethnographic work might contribute to building a more resilient critical theory of science and technology.

Then again, Moore does ultimately acknowledge the theoretical motivations driving her ethnographic pursuits. While there are hints throughout the book, the casual reader may be surprised to find in the conclusion her admission that "throughout this project I've grappled with moving beyond a purely Marxist analysis, though it is very apt" (159). Personally, this confirmed what I've suspected since Donna Haraway declared herself "something of an unreconstructed and dogged Marxist"; namely, that an ethnography of technoscience is most effective when cast within the broad conceptual framework of a Marxian political economy.[1] Not that Moore is simply after empirical evidence that Marx was right all along, but her ethnographic work reveals the human (and nonhuman) practices at the heart of capitalism in a way that encourages a critical appraisal of certain of Marx's central concepts. "Humans," she writes, "have expanded spider goats' capital potential through the very real microinteractions I observed in the field and the metastructures that sustain it" (126). Moore's attention to these microinteractions generates novel reflections on the Marxian concepts of false consciousness, alienation, species being, and capital, among others. In this sense, the book is an important Marxian ethnography of living capital alongside the work of Kaushik Sunder Rajan.[2]

Our Transgenic Future will appeal to interdisciplinary scholars in science studies and animal studies, as well as to those interested in broader theoretical debates within feminism, Marxism and the critical social sciences more generally. As Moore acknowledges, the book "evolved from my desire to learn, create, experience, and share, rather than my attempts to intervene or advance" (3). Her purpose is thus less to advance an argument than to explore the life world of the spider goats and experience the destabilizing effects of this world as they arise. As such, her work raises many more questions than it answers. But they are important questions and it was a pleasure to accompany Moore on her journey to reach them.

1 Donna Haraway, *Modest_Witness@Second_Millennium.FemaleMan©_Meets_OncoMouse™: Feminism and Technoscience* (New York: Routledge, 1997), 8.

2 Kaushik Sunder Rajan, *Biocapital: The Constitution of Postgenomic Life* (Durham, NC: Duke University Press, 2006).