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20

THE ETHNOBIOLOGY OF SURVIVAL IN POST-APOCALYPTIC DYSTOPIAS

GARY PAUL NABHAN AND JAMES R. VETETO

ETHNOBIOLOGISTS AND ENVIRONMENTAL anthropologists have recently engaged in both critical analysis and applied technical support of emerging expressions of ecotopian and utopian ideals (Lockyer and Veteto 2013). This is an exciting development, as it moves our discipline from being seen as a historical science with purely retrodictive capacity, to a forward-looking science with predictive capacity.

Although these efforts to evaluate and value emerging social movements on the margins of industrialized society are both laudable and ultimately necessary for advancing our species' survival, we must also consider the null hypothesis: Industrialized society may descend into a post-apocalyptic dystopia due to climate change, economic collapse, and/or the proliferation of rogue states and violent social environments (Rabkin et al. 1983; Peluso and Watts 2001; Tuhis-Dubrow 2013). We must consider the possibility that the human species, for one reason or another, will not survive on this planet, even though other lifeforms will continue to adapt and evolve here (Weisman 2007).

What then, can ethnobiologists and environmental anthropologists contribute to our consideration of these alternative futures, should the neoliberal technocratic fix fail to resolve the world's currently pressing problems (climate change, population growth, loss of biodiversity, etc.)? To begin with, ethnobiologists conversant with non-Western cultures may be less inclined to accept

the logical-positivist assumptions and technological fixes of industrial societies than other scholars. While ethnobiologists have only rarely included dystopian narratives in their previous research, they are likely to be quite accepting and appreciative of anthropologically informed dystopian novels such as those of Alfred L. Kroeber's daughter, Ursula LeGuin (1974), MacArthur Fellow Octavia Butler (1993), and Barbados-based multi-award winner Karen Lord (2013).

Curiously, these fine novelists, among others, appear to value ethnobiologists' lenses into diverse strategies for human survival as significant material to embrace in their own narratives. As Butler's young African American protagonist Lauren Olamina explains to one of her friends in a dystopian version of Metro Los Angeles set in 2025, survivors need to study up and strategize if they are to thrive in the post-apocalyptic era described in *Parable of the Sower*:

"We can get ready. That's what we've got to do now. Get ready for what's going to happen, get ready to survive it, get ready to make life afterward. Get focused on arranging to survive so that we can do more than just get batted around by crazy people, desperate people, thugs, and leaders who don't know what they're doing!" (Butler 1993: p. 55).

When Lauren Olamina's friend becomes dubious that studying what is in the vestiges of libraries might help them survive, Lauren responds by challenging her:

"'Read this.' I handed her one of the plant books. This one was about the California Indians, the plants they used, and how they used them—an interesting and entertaining little book . . . Take notes . . . You'll remember better if you do."

While science fiction such as this was once dismissed as second-class literature by many scholars, Octavia Butler is just one of many "cli-fi" (climate change science fiction) and dystopian drama writers whose artistry and morality cannot be so easily disparaged. The same is true with works such as *Oryx and Crake* by Margaret Atwood (2003); *Back to the Garden* by Clara Hume (2012), *The Road* by Cormac McCarthy (2006), *The Dispossessed* by Ursula Le Guin (1974), *Far North* by Marcel Theroux (2010), and even Barbara Kingsolver's (2012) work of speculative fiction that verges on cli-fi, *Flight Behavior*. While not all of these works are set in a dystopian future, Rebecca Tuhis-Dubrow (2013) correctly identifies their commonality:

"Most of the authors, seek, at least in part, to warn, translating graphs and scientific jargon into experience and emotion. . . . They refashion myths for our age, appropriating time-honored narratives to accord with our knowledge and

our fears. Climate change is unprecedented and extraordinary, forcing us to rethink our place in the world."

PARALLEL MOTIONS

Both ethnobiology and science fiction have increasingly focused on climate change. In 2005 Robert Macfarlane lamented the lack of engagement between writers and climate change. Ten years later this is clearly not the case and whole sub-genres such as cli-fi have emerged. The trend has been similar in environmental anthropology and ethnobiology. Ten years ago the literature was scant; today climate change is a central focus of both natural and social sciences (e.g. Wolverton et al. 2014, Veteto and Carlson 2014, Nabhan 2013, Crate 2011, Friese et al. 2011, Crate and Nuttall 2009, Roncoli et al. 2009). For serious minded ethnobiologists—focusing on issues such as cultural preservation and revival, traditional ecological knowledge, seed conservation strategies in the face of climatic catastrophes and war, tribal sovereignty, human adaptation, and a host of other important quandaries—why should an engagement with speculative fiction hold any promise for their work?

Looking over the history of science fiction writing, one cannot cease to be amazed with the enormous predictive power it has shown. In his 1888 novel *Looking Backward*, Edward Bellamy wrote about the use of credit cards sixty-two years before they became reality. AT&T introduced videoconferencing at the 1964 World's Fair in New York, but science fiction writers had been discussing it since Hugo Gernsback's story *Ralph 124c41+*, which was first published in 1911. In *From the Earth to the Moon*, written in 1865, Jules Verne (remarkably) forecasted astronauts launching from Florida in aluminum capsules and fairly accurately calculated the amount of force it would take to propel them out of the earth's atmosphere, over one hundred years before the event actually took place. So many of Aldous Huxley's future imaginings from his 1931 dystopia *Brave New World* have come to pass, at least in part, from antidepressants and genetic engineering, to mass consumerism and sexual promiscuity, that he might be widely considered a seer or prophet if he was born into a different culture. The Internet was foreshadowed by Mark Twain's telelectroscope, which allowed for global communication and social networking in his 1898 short sci-fi short story *From the 'London Times' of 1904*.

Given the remarkable propensity for projecting future events that science fiction writing has shown, cli-fi novels might bear more careful consideration from ethnobiological science, much as we put careful consideration into the oral histories and traditions of our indigenous interlocutors. Cli-fi writers might properly be looked at as myth-builders of our postmodern age.

For example, Kim Stanley Robinson's *Science in the Capital* "hard" cli-fi (science fiction writing characterized by scientific accuracy and technical detail) trilogy shows an astute capacity for predictive power, understanding and integration of contemporary climate science, policy recommendations, and sociocultural change. On the heels of a Hurricane Katrina–like flooding of Washington, DC (published a year before Katrina struck New Orleans; an aspect of the flood was also a fictive 'Tropical Storm Sandy' that bore some resemblance to 2012's devastating Hurricane Sandy), Robinson's protagonists, mostly a group of scientists working for the National Science Foundation, rearrange the entire mission of NSF to study climate change, research mitigation strategies, and employ massive measures to stave off climate disaster for humanity. Along the way they are able to re-start the stalled Gulf Stream and North Atlantic Drift by coordinating a massive international effort to re-salinize the ocean to offset the massive influx of fresh water from melting glaciers, pump rising ocean water into dry lake beds in deserts and drought-stricken regions and back onto melting glaciers at the poles to re-freeze, help elect a U.S. president on a climate change ticket who believes "a scientifically informed government should lead the way in the invention of a culture which is sustained perpetually" (permaculture—mentioned throughout the whole series), present and employ a workable plan for transitioning the United States to sustainable energy sources, and strike a historic, cooperative treaty with China where the United States uses its technical expertise and resources (in exchange for debt relief) to help China immediately transition away from coal and other dirty energy technologies in the face of extreme environmental collapse. Robinson's (2004, 2005, 2007) understanding of climate change is top-notch throughout (relying on careful readings of top climate change scientists, such as the IPCC [2007]) and he captures prominent and more radical environmental social trends such as eco-Buddhism, permaculture, feral foraging, communalism, freeganism, and squatting in his writings. Robinson's central concept of *abrupt climate change* warns that devastating climate change may happen much quicker, with sudden onset, than most scientists are willing to consider.

Other cli-fi writers are similarly suggestive in their observations and prescriptions. Do Atwood's God's Gardeners in *Oryx and Crake* and *Year of the Flood* (2010), using rooftop gardens as a way to feed themselves and provide defensive positioning against gangs and marauders, a spiritual path, and as resistances against the all-powerful Corporations, suggest a potential model for the future of urban gardening? Does the matriarchal motorcycle gang in 2015's dystopian box-office hit *Mad Max: Fury Road* provide any clues to the roles ecofeminist seed keepers may play in protecting the cultural heritage of garden seeds after a nuclear holocaust? Will marginal, rural, out-of-the-way places like the Siberian tundra in Theroux's *Far North* be more hospitable for humans than lawless cities in a post-collapse, climate change world? These (among many others) are questions that are currently being asked by cli-fi writers, which may be of interest to engaged ethnobiologists as well.

POTENTIAL ENGAGEMENTS

How, then, can ethnobiologists contribute more broadly to helping cultures that still survive on this earth to rethink their places in the world? We can preliminarily provide twelve considerations, which may help survivors of any apocalypse guide their future selection of foods, medicines, and utilitarian plant and animal resources:

1. While there remains some value in reading general references such as Balls (1972)—the interesting and entertaining book on edible California plants likely alluded to in Butler (1993), the more pertinent guides are those that specifically focus on famine foods, such as Minnis' work (1991). Interestingly, Minnis points to the importance of cultural rituals and myths in transmitting knowledge about famine foods between periods of drought, war, or unrest.
2. Secondly, it is important to recognize that climate change, use of toxins, and anthropogenic disturbances to land and water are dramatically affecting the distribution and abundance of historically used edible and medicinal plants, so that some have become locally extirpated or are verging on global extinction.
3. Not only are potentially important wild food plants and animals declining to the point of scarcity, but their pollinators have also become increasingly scarce, leading to possible "food web collapse" (Dobson et al 2009).
4. Chemical, microbial, and thermal contamination of water will likely render some formerly edible fish, shellfish, and aquatic plants inedible, toxic, or hazardous.

5. As Tuhus-Dubrow (2013) aptly emphasized, adequately detailed knowledge of plant and animal usage as foods and medicines is lacking in most written records, so that appropriate dosages or preparation techniques may be unexplained: "It's the accumulated knowledge of millennia that verges on extinction" in many cases, not the wholesale disappearance of the plants and animals themselves.
6. Since 1998, at least twelve herbicide-tolerant weeds have begun to dominate anthropogenic landscapes in North America and elsewhere. Some of these weeds, such as Palmer's amaranth (*Amaranthus palmeri*), common waterhemp (*Amaranthus rudis*), Italian ryegrass (*Lolium multiflorum*), jungle grass (*Echinocloa colona*) and Indian goosegrass (*Eleusine indica*), have long been harvested for food, fuel, or fiber by many cultures around the world. These now ubiquitous agrestals and ruderals are likely to remain prevalent in a post-apocalyptic world.
7. Catastrophic events and ocean rising will likely displace many indigenous (as well as other) cultures, exposing them to unfamiliar habitats and novel ecosystems.
8. There will likely be a greater focus on perennial multipurpose (food and medicinal) plants in the future (Jackson 1980). Fossil fuel and water-intensive monoculture will become increasing vulnerable, and people will revert to using readily available foods and medicines from wild, semi-wild, and managed habitats near their homes or encampments. Perennial plants can survive and reproduce without nearly as much human intervention as annuals. However, human semi-management and incipient domestication has allowed for long-term, fairly intensive production and movement of plant resources that have supported or partially supported complex indigenous societies, such as in the Pacific Northwest of the United States and Canada (Turner et al. 2011, Turner 2005, Peacock and Turner 2000, Turner and Kuhnlein 1983). Alternative agriculture approaches including permaculture (Veteto and Lockyer 2008, Holmgren 2002), natural farming (Fukuoka 2009, 1985), and perennial polyculture (Jackson 2011, 1980) suggest future possibilities and imaginings of interest to ethnobiologists, as models for cli-fi writers, and as survival tools for humankind.
9. The permaculture principle of *Use Edges and Value the Marginal* (Holmgren 2002) will be increasingly instructive, both as model and metaphor. As Turner et al. (2003) have convincingly argued, Indigenous Peoples are drawn to areas having a high incidence of ecological edges (transition zones between two relatively distinct ecosystems that contain higher biodiversity levels) and they actively create and maintain edges; providing themselves with more cultural capital, flexibility, and resilience—all variables of great importance when anticipating potential climate change adaptation. Metaphorically, both ethnobiology and cli-fi are at the edges of disciplines and genres—ethnobiology a combination of social and natural sciences and cli-fi at the forefront of pushing science fiction into increased interaction with climate science—and the fruitful ground they are exploring can arguably be combined to provide imaginative spaces brimming with more diverse possibilities.

10. Increased teaching of the patterns (family) method of plant identification (e.g. Elpel 2013, Botany Every Day 2015). Rather than learning plant species one at a time, if students of botany and ethnobotany can increasingly be taught both how to identify plant families and their general uses, we may promote a necessary return to the everyday integration of a wide diversity of plants in our lives. For example, if students know that any species in the *lamiaceae* (mint) or *brassicaceae* (mustard) families are safe to use as tea, food, or medicine, it can greatly increase their access and use of plant resources across the world. Likewise, if they know certain plant families, such as runnunculaceae, are largely poisonous, they can safely avoid toxic plants.
11. Developing a discipline of *integrative ethnobotany*. Both authors have noticed a trend over the past twenty years or so that a lot of the best ethnobotany is taking place outside of the academies in venues such as Traditional Chinese Medicine schools, Western herbalism schools, primitive skills gatherings, permaculture institutes, and through classes given by roving or place-based, largely self-taught, yet highly knowledgeable ethnobotanists. Along with well-known databases of indigenous uses of plants developed by ethnobiologists (e.g. Moerman 1998), there is now a plethora of non-academic literature from diverse ethnobotany traditions. Knowing how plants are used in Chinese Medicine, Tibetan Medicine, Ayurveda, and Appalachian cultural traditions, for example, gives students and practitioners of ethnobotany a wider range of information to use in an integrative, cosmopolitan approach that can increasingly be utilized in many different locales, due to the migration of plants and peoples that has taken place during the globalization process.
12. We need to widen our palates and pharmacopeias in wider and more uncomfortable realms: edible wild mushrooms, fungi, moss, lichen, and ferns, in addition to insects, snakes, feral animals, and road kill. Done responsibly, this can be accomplished as a form of environmental restoration as well. For example, in Texas and south Arkansas, where wild pigs are destroying whole landscapes and disturbing neighborhoods and farms, a nascent feral pig barbecue tradition is just waiting for participants and local-food entrepreneurs. The Chinese, obviously, are pioneers in incorporating a wide range of living organisms in their

traditional and modern diets. If such practices can be done sustainably, they will release pressure from being dependent on relatively few species for our nourishment, and can help train and prepare us for potential dystopian futures.

To adapt to an uncertain climate change future, it is likely that traditional elders, as well as pragmatically applied ethnobiologists with foraging, fishing, hunting, and farming experience will be more highly valued by society than they are today. Indeed, we absolutely need to continue our work documenting and promoting traditional ecological knowledge (TEK), tangibly working at the grassroots level on ecological restoration to build resilience to dampen or mitigate climate change's impact on communities, as well as testifying in Native (First Nations) land and water rights cases.

However, in addition to maintaining our collaborations with cultural storytellers and wisdom keepers, we also see validity in engaging with cli-fi writers in attempts to coauthor new ethnobiologically oriented speculative fiction ourselves. Today, the term "translation science" refers to novel approaches to innovatively communicating the facts and values of science to diverse constituencies, cultures, professions, and age groups without "dumbing down" or omitting essential details. It may be time for ethnobiologists to invite cli-fi, sci-fi, and other speculative fiction writers and filmmakers into collaborative projects and think tanks. Films such as *Mad Max*, *Maze Runner*, *Hunger Games*, *Legend*, and *The Road* reach far more hearts and minds than ethnobiologists can currently hope to do. Is it not time for ethnobiologists to help renew and reshape the stories and subsistence practices that may be vital to our survival in the future? Our cultures may depend upon it. As the acclaimed environmental scientist Tim Flannery (2010: p. xiv) has asked us to consider,

"What lies on the other side? Where will evolution take us? Intelligent Earth—or *The Road*?"

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