

HOW SCIENTISTS THINK; ABOUT 'NATIVES',  
FOR EXAMPLE. A PROBLEM OF TAXONOMY  
AMONG BIOLOGISTS OF ALIEN SPECIES  
IN HAWAII

STEFAN HELMREICH

*Massachusetts Institute of Technology*

This article examines how biologists in Hawaii investigating 'invasive species' classify 'native' and 'alien' organisms, particularly in the epistemologically ambiguous zone of archipelagic waters. Framing analysis in terms of the Sahlins–Obeyesekere debate, the essay explores how, far from being a straightforward matter of biological definition, such classification presents taxing taxonomic and political questions, especially in Hawaii, where the word *native* resonates with descriptors used by and for the indigenous people of Hawaii. Drawing on ethnographic research in the overlapping worlds of marine biologists and Native Hawaiian educators and activists, the article scrutinizes the shifting boundaries of nature, culture, agency, and time in the classificatory practice of 'invasion biology'. Looking in particular at accounts of 'alien algae' and amphidromous crustaceans, the article explores how 'context' is diversely deployed to frame accounts of native and alien marine creatures in Hawaii. A meditation on modes of *metataxonomic* and *parataxonomic* classification concludes.

Descending the escalator into the Honolulu airport baggage claim one day in June 2003, I found myself gliding toward a Hawaii Department of Agriculture poster reading 'HELP PROTECT HAWAII. Undeclared fruits, vegetables, plants, and animals can cause damage to Hawaii's fragile environment'. Later that evening, at a store stocked with damp, dog-eared books near the University of Hawaii at Manoa, I happened upon a 2001 volume entitled *Hawai'i's invasive species*, in which I read that the Hawaiian archipelago, the most isolated in the world, has been the location most 'invaded' by organisms introduced by humans (Staples & Cowie 2001).<sup>1</sup> Hawaii is a poster island chain for 'invasion biology', a life-sciences specialty that takes as its object species out-of-place, organisms often called 'alien species' – or, sometimes, 'introduced species', to highlight the role of human agency in moving living things between ecosystems (Van Driesche & Van Driesche 2000). Non-human organisms have long been transported across widely separated localities, but invasion biologists argue that rates of travel increased steeply in the twentieth century (Pimentel 2002). Aeroplanes like the 757 on which I flew in are relatively minor 'vectors', to use the vaguely medical language employed in this field. Of greater concern to biologists of island zones like Hawaii are less

monitored paths of transfer associated with the ocean: boat hulls and ballast water have hosted organisms – molluscs, seaweeds, crabs – across distant ports, with a variety of deleterious effects (Cox 1999).

Weeks after my arrival in Hawaii, where I travelled to conduct anthropological research on the politics of ‘marine bioprospecting’ (the search in ocean-going organisms for properties of pharmaceutical and industrial application) (Helmreich 2003), the State of Hawaii Department of Land and Natural Resources released a draft of an Aquatic Invasive Species Management Plan. The plan detailed dangers of aquatic alien species and extolled virtues of native species, offering:

Aquatic invasive species (AIS) include species in marine, freshwater, brackish water, and estuarine environments, whose introductions cause or are likely to cause economic or environmental harm, and/or harm to human health. AIS are a serious problem in Hawai‘i, posing a significant threat to Hawai‘i’s native plants and animals, as well as their associated ecosystems.<sup>2</sup>

In *Alien invasion: America’s battle with non-native animals and plants*, journalist Robert Devine, writing of non-human flora and fauna, suggests, ‘Hawaii’s natives are vulnerable because of the rapid change brought on by modern civilization’ (1998: 262).

How do biologists define ‘native’? Far from being a straightforward matter of biological classification, this is a taxing taxonomic question, especially in Hawaii, where the word *native* resonates with descriptors used by and for the indigenous people of Hawaii, known as ‘Native Hawaiians’ (though, also, inspired by Hawaiian sovereignty movements, as ‘Kanaka Maoli’ [Merry 2000: xiii]). This article, based on interviews I conducted in summer 2003 with scientists at the Hawaii Biological Survey of the Bishop State Museum of Natural and Cultural History, at the University of Hawaii, and at the Waikiki Aquarium, maps the ways in which biologists sort these things out, especially in the aquatic realm. Classificatory issues become particularly vexed when sited in the sea that weaves in and out of this part of what Europeans have called Polynesia. The categorization of native and alien species in the politically charged geography of Hawaii and, more, in the epistemologically ambiguous zone of Hawaiian waters is instructive, I argue, for meditating on how scientists think: about ‘natives’, for example.

In *How ‘natives’ think: about Captain Cook, for example*, Marshall Sahlins (1995) maintains that eighteenth-century Native Hawaiian cosmological categories were capacious enough to consider Captain Cook an instantiation of the chiefly Akua,<sup>3</sup> Lono. Sahlins argues against Gananth Obeyesekere, who holds in *The apotheosis of Captain Cook* (1997, first edition 1992) that accounts portraying Cook as god-like for Hawaiians are examples of European myth-making. Native Hawaiians, Obeyesekere maintains, employed a universal human practical reason to see Cook for what he was: a human being – not an entity partaking of both natural and supernatural orders. Sahlins responds that Obeyesekere’s argument evaporates cultural difference, turning all people into bourgeois rationalists. At stake in the Sahlins-Obeyesekere debate have been questions of the translatability of categories and the meaning of practice in diverse historical and political settings (Borofsky 1997). Sahlins’s argument is that ‘culture’ works as a system of practical reason, but that practice

and reason unfold within symbolic systems shaping what counts as empirical and interpretative, natural and supernatural.

Questions of classification, of alignments between the empirical and the interpretative, have been at the heart of anthropology. Classifications – of kin, land, and food, to take a few examples – have been understood to afford neat points of access to cultural difference (e.g. Douglas 1966). But it has been the classification of things in that realm that Western culture has named ‘nature’ to which anthropologists have appealed most sharply to press points about the socially created character of ways of thinking about the world. Thus, in ‘Why is the cassowary not a bird? A problem of zoological taxonomy among the Karam of the New Guinea Highlands’, Ralph Bulmer (1967) explores why, for the Karam, cassowaries are not the avians that European taxonomy takes them to be. Bulmer argues that in the local imagination, cassowaries are sisters and female cross-cousins to Karam men, and so cannot be classed as birds. Of course, to pose his question at all, Bulmer must hold to the grid of Western zoology, taking ‘biology’ as an idiom into which all cultural systems can eventually translate. Harriet Ritvo (1997) in *The platypus and the mermaid, and other figments of the classifying imagination* has advanced a more culturally located view of the creation of European biological categories, outlining the variety of principles used in classification before Charles Darwin settled on genealogy. Many such principles – locomotion, diet, physiology – survive in present-day taxonomical practice.

Let me again pose my orientating question: how do scientists think, about ‘natives’, for example? Such a broad query demands an ethnographic answer, one reason why I locate my inquiry in the stream of discussions about aquatic invasion biology in contemporary Hawaii. Adapting Sahlin’s argument, I argue the obvious but important point that biologists make their way through the world with a sense of the empirical nested in frameworks of interpretation. Such a contention suggests there is no one way in which scientists think; rather, we must attend to contexts called into relevance in various accounts. More, we must listen to how ‘context’ itself is invoked by scientists as they explain their taxonomic enterprises. Following Marilyn Strathern (1991), I scrutinize ‘context’ as an analytic concept that is densely part of scientific, cultural practices of classification.

I begin with the story of *Hawai‘i’s invasive species* (Staples & Cowie 2001), reporting on conversations with some of the book’s contributors and scientists for whom the text represents an important intervention into biological research. I then look at scientists keen to enmesh their classifying activities in Native Hawaiian practice. I consider what happens when what is political ‘context’ for my first set of scientists becomes crucial – and flexible – cultural *content* for the second. I conclude with meditations on the taxonomic mode of knowledge.

### **Naming native and alien**

Let me present, in summary form, definitions used by invasion biologists in Hawaii to think about native and alien species, on land or at sea. I adapt the following from *Hawai‘i’s invasive species*:

*Native species* – found naturally in an area, not introduced by humans; includes both indigenous and endemic organisms.

*Endemic species* – naturally restricted to a particular place and found nowhere else.

*Indigenous species* – naturally occurring in a given area as well as elsewhere.

*Alien species* – non-native, that is, a species introduced to a place accidentally or intentionally by humans.

*Accidental introduction* – a species introduced by humans by chance, without intent, or through carelessness, and often with unfortunate results.

*Intentional introduction* – a deliberate introduction of a species (either authorized or unauthorized) by humans, involving the purposeful movement of a species outside its natural distribution.

*Invasive alien species* (= invasive species) – alien species whose introduction and rapid, aggressive spread does or is likely to cause commercial, agricultural, or environmental harm or harm to human health.

This categorization is organized around the presence or absence of the agency of humans and, once we arrive at the category of ‘invasive’, around what particular groups – small farmers, developers, or agribusiness, for example – designate as harmful. This is a *metataxonomic* category, transcending the classificatory grid of biological nomenclature. The Hawaii Biological Survey at the Bishop Museum in Honolulu maintains a ‘Checklist of the Marine Invertebrates of the Hawaiian Islands’, which can be searched online using Linnaean categories of phylum, class, order, family, genus, and species, but which also allows perusal by ‘biogeographic status’, including ‘native’, ‘introduced’, or ‘cryptogenic’ – which last designates species whose status as native or alien/introduced is uncertain.<sup>4</sup> Biogeographic status is not a Linnaean category; it is more historical than evolutionary. *Nature* and *culture* are the organizing rubrics in this metataxonomy, as in Table 1.

On the surface, this classification offers a simple mapping of natural versus cultural agency, but note that the category ‘invasive’ requires a further step: social judgement of harm. It might seem that this category could fairly be judged to be fully social rather than a matter of objective taxonomy – and, indeed, one author in *Invasive species in a changing world* argues that ‘the “noxious invasive” of one group is the “desirable addition” of other groups’ (McNeely 2000: 183). But many biologists argue that there are in fact measurable, recognizable characteristics of invasive species. These characteristics

TABLE 1. Classification of native and alien species by natural and cultural valence

NATURE	CULTURE
native	alien/introduced
endemic	accidental
indigenous	intentional
	invasive

might be employed to move a creature from ‘cryptogenic’ to ‘introduced’. According to *Hawai‘i’s invasive species*, such organisms are:

adaptable to and capable of thriving in different habitats;  
 tolerant of a range of conditions (light, temperature, moisture);  
 able to eat and survive on a diversity of food resources;  
 fast growing, thereby able to displace other plants or animals;  
 disturbance-tolerant, able to proliferate in places disturbed by humans or natural events;  
 easily dispersible to new localities (Staples & Cowie 2001: 3-4).

Reproductive features are also important. Invasive species are

able to produce many seeds, larvae, or juveniles and begin doing so early in life;  
 for plants, able to reproduce vegetatively as well as by seed;  
 for animals, species with clonal or hermaphroditic reproduction may be especially invasive;  
 have long breeding seasons, or even breed year round;  
 have seeds, eggs or larvae easily dispersible, for instance by animals, wind, or accidentally by humans;  
 for plants, have seeds with no special germination requirements (such as a period of heat or cold exposure, soaking in water, drying out) (Staples & Cowie 2001: 4).

The behavioural characteristics enumerated mean to define invasives with respect to biological concepts – of robustness, fecundity – but are also criteria that, as biologist Banu Subramaniam points out, resonate unfortunately with xenophobic anti-immigration language in the United States and Europe:

The parallels in the rhetoric surrounding foreign plants and those of foreign peoples are striking ... The first parallel is that aliens are ‘other’ ... Second is the idea that aliens/exotic plants are everywhere, taking over everything ... The third parallel is the suggestion that they are growing in strength and number ... The fourth parallel is that aliens are difficult to destroy and will persist because they can withstand extreme situations ... The fifth parallel is that aliens are ‘aggressive predators and pests and are prolific in nature, reproducing rapidly’ ... Finally, like human immigrants, the greatest focus is on their economic costs because it is believed that they consume resources and return nothing (2001: 29-30, citations omitted).

Anna Tsing (1995) makes related points about panicked media discussion of ‘Africanized bees’ (and see Bright & Starke 1998). New Zealand’s National Centre for Aquatic Biodiversity and Biosecurity uses extreme imagery of ‘devastating foreign invaders’ (2002: 8).

But in Hawaii, rhetorics of invasive alien species partake of a different politics. This is because organisms introduced during the original human settlement of Hawaii, beginning as early as 400 CE – ‘pigs, taro, yams, and at least thirty other species of plants (and rats as stowaways)’ (McNeely 2000: 172) – are sometimes tightly associated, even identified, with the people who introduced them, frequently designated by their descendants and others as ‘native’. This suggests that not all human agency is to be treated identically. As biologist James Carlton puts it, ‘not all invasions are created equal’ (2000: 42). We must look at particulars.

### Hawaii as ‘context’

According to scientific wisdom, the archipelago of Hawaii, a relatively recent volcanic formation,<sup>5</sup> is highly vulnerable to alien invasions. But definitional matters are complex; many Polynesian introductions are considered native, a fact that came into view during my conversations with scientists working in the Hawaii Biological Survey at the Bishop Museum. The Museum has as its mission ‘to record, preserve and tell the stories of Hawai‘i and the Pacific, inspiring our guests to embrace and experience our natural and cultural world’.<sup>6</sup> I spoke with several scientists at the Bishop Museum. None identified as Native and all were careful not to speak on behalf of indigenous people; all would be designated as ‘haole’ or white in the terminology of ethnic belonging in Hawaii.

Over lunch in the Bishop Museum, marine biologist Ron Englund provided me with this taxonomy of the *native* and the *introduced*, with reference to Hawaii:<sup>7</sup>

- native*: ‘things that got here under their own power, without humans’.  
*endemic*: ‘Creatures can be endemic to the Hawaiian archipelago, to just one island, or even one volcano’.  
*indigenous*: ‘native to an area but also widespread elsewhere, like other islands or continents’.

#### *introductions*

*Polynesian introductions*: ‘anything brought here during the original settlement of these islands. What these are called depends on whom you talk to. A Native Hawaiian – and I don’t want to speak for Native Hawaiians – might also call these things *indigenous*. Why? Because they don’t cause any problems and are economically beneficial. Some examples are taro and sweet potatoes. These are in a different categorization because they’re culturally important. They are not invasive because they are considered highly desirable’. [Taro, a symbol of pre-contact settlement and the Native sovereignty movement, is exemplary.]

*non-indigenous*, also *introduced*, *non-native*, sometimes *alien*: ‘anything brought by man within the last 200 years, since Cook arrived [in 1778]. Cook is a cut-off point because after him, the quality and quantity of introductions increased. And if you’re native, you have to trace your heritage back before he arrived’.

*invasives*: ‘introductions that are harmful, outcompeting local organisms’.

In this taxonomy, ‘indigenous’ fluctuates, sometimes excluding any human introductions, sometimes including only Polynesian ones. Another scientist pointed out to me that this is tricky territory, offering that ‘most people [in Hawaii] who are Native are also part Caucasian or Filipino’, suggesting the claim of ‘nativeness’ might be strategic, not strictly warranted by the biology of the matter (though categories like Caucasian or Filipino are not biological either – indicating the complexity of thinking these matters through in a biological idiom [see Kauanui 2002]). When I reported this analogy to Englund, he found it problematically racist, though he noted that entanglements with Native politics were anyway unavoidable. And such associations were not necessarily always essentialist or divisive: often, they helped direct public attention toward the problem of introduced species. *Hawai‘i’s invasive*

*species* carries an approving blurb by the famous Hawaiian navigator Nainoa Thompson:

We are all so privileged to live in Hawai'i, with its rare, beautiful, and fragile natural environment. Each of us has an obligation to *malama* this place – ensure that we practice stewardship at its highest level ... *Hawai'i's Invasive Species* is a wonderful contribution to that effort. With their straightforward explanation of the fragility of our environment, the harm brought by alien and invasive species and the action each of us can take to preserve Hawai'i's biodiversity, the authors have done much to *malama* Hawai'i.

I found another link between native species and Native Hawaiian politics in a document in the Hawaii State Archives. University of Hawaii botany professor Will McClatchey, in connection with Hawaii Senate Bill 643 (introduced in 2003), calling for a moratorium on local bioprospecting, argued that Hawaiian species should be off limits to bioprospectors:

The major categories of species that should be of concern are ALL indigenous and endemic plants and animals that were introduced by the ancient Polynesians or developed over the history of the Hawaiian people. These plants and animals are the natural inheritance of native Hawaiians and should not be freely used by others without consent and recognition of the long-standing relationship (faxed to the Committee on Judiciary and Hawaiian Affairs and the Committee on Water, Land, and Agriculture, 5 February 2003).

On this view, 'indigenous' and 'endemic' plants and animals can be at once 'introduced' and a 'natural inheritance of native Hawaiians', a definition that does not draw the same lines of agency as categorizations above. Table 2 illustrates McClatchey's parsing. Here, Native Hawaiians are allied with nature. Indeed, they are positioned as *part* of nature. Intriguingly, however, there is room for their 'natural inheritance' to be 'developed over ... history'. So, 'nature' might be complex, admitting of historical entwining with 'culture'. In *In Amazonia* (2002), Hugh Raffles argues that Amazonian 'nature' has been reinvented many times, from early days of European colonialism to contemporary environmentalism. But where the 'nature' of which Raffles writes is continually reinvigorated for participants as 'pristine', McClatchey's articulation allows a more historical imagining of the transformation of a nature always under revision (see Ingold 1990).

It is clear that not all scientific statements align on how to think about native non-humans. Bishop Museum scientists with whom I spoke are inclined

TABLE 2. McClatchey's classification of native and alien species

NATURE	CULTURE
native	alien
endemic indigenous introduced by ancient Polynesians developed over history of Hawaiian people	accidental intentional invasive

to say that Polynesian introductions are, well, introductions. Steve Coles, a marine invertebrate zoologist, for example, told me:

Obviously, for an island, everything is introduced. The ancient Hawaiians altered the environment, too, and not always for the better as far as native plants and animals were concerned. But with the arrival of European ships and commerce, the scale increased dramatically and the consequences have been much more invasive and severe.

(Cf. McNeely 2000: 187: ‘The problem of human-induced invasive species is as old as our own species.’)<sup>8</sup> Another invertebrate zoologist told me that when it comes to things like taro,

[i]t depends on whether you talk to a person who says they’re Hawaiian, or a twenty-first century biologist, who says they’re introduced. If you go back far enough everything is an introduction. Native is something you could think would be here pre-Polynesian days. But you have to work on definitions. It depends.

The first sentence is ambiguous; it is not clear whether ‘Hawaiian’ refers to the organisms under definitional scrutiny or might also refer to a hypothetical Hawaiian person. The saturation of this sentence by two possible readings is a sign of the complexity of speaking in the same breath about biology and politics in Hawaii. Another scientist at the Bishop reflected, ‘This is a very culturally sensitive issue. We prefer to call them “canoe species”. They’re still introductions. There are about thirty canoe species, and some of them are unintentional introductions, like the rat’. This scientist suggested that rats were invasives, placing the agency of canoeing humans in the same realm as later seafarers. Ancient Hawaiians, then, for the three scientists whom I have just quoted – somewhat distinctly from McClatchey – are not part of nature. The ‘context’ of Hawaii requires attention to questions of ‘scale’ as well as sensitivity quite literally to ‘the natives’ point of view’ – but it would not seem to require a thoroughgoing redefinition of the textbook meaning of ‘introduction’.

Richard Archer,<sup>9</sup> a haole biologist at the University of Hawaii, expressed concerns with attempts to recognize Polynesian introductions as ‘native’ to Hawaii:

Native plants are those species that found their way to Hawaii without human intervention, or evolved here from those founding populations. Cultural revival movements often want to retrieve practices promoting the return of Hawaii to a natural environment, but not always are these a part of the pre-human Hawaii. Thus their concept is something pre-1778 rather than before about 1,500 years ago.

A story presented in *Alien invasion* offers the kind of alignment between nature and culture that Archer considered problematic. Devine recounts a conversation with a Hawaiian healer, Kapi’koho Naone III:

‘With so many alien species, some of them real destructive, traditional practitioners are afraid,’ said Naone. Tradition and the need for high-quality plants demand that Hawaiian healers can gather their specimens in the wild ... Naone also worries about the effects of alien species on Hawaiian culture in general. ‘Hawaiian traditions have been gaining ground in recent years,’ said Naone. ‘Our plants and animals are very important



to those traditions. Our environment and our culture are all intertwined.' Nainoa Thompson, the master navigator ... shares Naone's concern. He writes, 'Each time we lose another Hawaiian plant or bird or insect or forest, we lose a living part of our ancient culture. Stopping alien pests is about choosing our future and saving our past' (1998: 276).

Archer found such reasoning too pat. Moreover, thinking of Hawaii's eight main islands as one geographical entity to which plants might be 'native' had led, he said, to accelerated shufflings of plants from one island to another. In 1997, the Department of Land and Natural Resources declared: 'In addition to a license, a Hawaii department of agriculture inspection is required to transport plants between the islands'.<sup>10</sup> But recent years have seen organisms more freely criss-crossing the chain – often under Hawaiian vernacular names. 'Ironically', Archer told me, 'the encouragement of people to grow native plants has created a mechanism for bringing in alien species'. He continued,

Until the later part of the twentieth century, state policy discouraged people from growing or transporting native plants. This policy on the one hand promoted the wide-spread use of alien species within the islands, but on the other kept the local island gene pools relatively pure. Relaxing of these policies over the last decade has aided in the survival of rare species but has worked to break down the unique island gene pools on the other. There is also a growing trend towards restoration of the natural environment, or 'attempts to return to the old Hawaii'.

He saw this as a more general issue in indigenous epistemology:

Most aboriginal cultures believe that they are in tune with the land. These peoples have generally remained in one place for a long time; they believe that their lives are in balance with their environment. This balance is a matter of human survival. However, while it may appear true on a generational scale, they are in fact moving *with* the very gradual changes they make within the landscape. Introduced species that become invasive species tend to be landscape-altering, which goes against the idea of a culture living in harmony with the environment. So, for example, if you now suggest that an introduced plant is invasive, it may be considered offensive and insulting to those cultures.

Recounting a meeting with taro farmers, Archer remembered, 'They were saying "We have to restore Hawaii to what it was". There is now a period of "let's try and recreate what we lost". So, there is a lot of speculation and invention going on. A lot of wishful thinking is involved in recreating this past'. People were thinking of introduction ahistorically.

So, how do these scientists think about 'natives'? There are a few answers. For McClatchey, plants and animals can be native if introduced by native peoples; there is a relevant difference in kind here. For people like Archer, native plants and animals belong to the realm of nature, a space outside human agency. On this view, humans, by virtue of being humans, cannot themselves properly qualify as native, especially on an island. 'Nativeness' for humans becomes a matter of political strategy or a romanticized invention of tradition (Hobsbawm & Ranger 1983). In Archer's view, native peoples adapt to their landscape using practical reason, but this does not render their agency different in kind from other humans. Archer had keen ideas about how to stabilize 'nature' amidst Native renamings. Speaking of Hawaiian names for plants, he said,

Perceptions change of what cultivars or varieties are and we need a way to pin them down. Cultivar names are not set down in a Linnaean scientific way. Likewise, common names change from place to place. In the future, we'll want to know that the Hawaiians had *these* species, and we will be able to determine them with *these* DNA fingerprints.

Nature, transcribed into the language of genetics, would for Archer provide the basis for discerning which creatures were native. To borrow a phrase from Karl Popper, we might say that Archer appealed to the genetic assay as an authoritative 'context of justification'. Archer found any other 'context' irrelevant, and focused on the 'text' of DNA as the code that could adjudge how nature sorted itself out.

We might take the opposite view: invasive species undo our concepts of the 'natural' itself. A contributor to *Invasive species in a changing world* writes:

The general global picture is, then, one of tremendous mixing of species with unpredictable long-term results. While many introduced species have special cultivation requirements that restrict their spread, many other species are finding appropriate conditions in their new homes, while many more may invade their new habitats and constantly extend their distribution, thereby representing a potential threat to local species. All of this calls into question the concept of 'naturalness' (McNeely 2000: 175; and see Sprugel 1991).

We could say that the scientists of whom I have written so far think about 'natives' in ways that call upon 'nature' and 'culture' even as they demonstrate the instability of this distinction. In this process of either affirming or denying 'culture' as a conditioning frame for understanding 'nature', these biologists *produce* the very idea of 'context' that allows them to parse the world in this way.<sup>11</sup>

Another means of approaching the question of how scientists think about natives would be to ask how scientists think about Captain Cook. Cook, I suggest, marks a difference in either degree or kind in the character of biological introductions to Hawaii. Those who think Cook's arrival only accelerated the rate of a process already in motion – a difference in degree – will not class canoe species with the native. Those who think Cook's arrival ushers in a different regime of introduction – a difference in kind – will be more likely to class Polynesian introductions with the native. Much turns on ideas about the history of nature. Devine, in *Alien invasion*, writes that

by nature's standards, the pace of introduction has become extremely rapid: hundreds and thousands of times faster than is natural. Consider Hawaii, whose isolation made it exceptionally difficult to reach by natural means. Researchers calculate that prior to the arrival of humans, a new species arrived on this chain of islands about once every 70,000 years. Today, despite efforts to keep non-natives out, a new exotic becomes established every 18 days. That's about a million and a half times faster than the natural rate (1998: 10).

Posed in these terms, the question becomes one of a threshold rate at which 'nature' is left behind. Is it after European sailing ships? Steam? Aeroplanes? The opening of Western trade with China in the 1970s? GATT? The question is about scale and point of view – about 'context'. It is also about time.

Sally Merry argues that Sahlins and Obeyesekere omit the dimension of time from their analyses: 'Neither position examines how the meanings of ... events unfold over time as participants endeavor to make sense of each other

in the light of developing events and actions' (2000: 332 n. 9). Neither anthropologist, she holds, allows for readjustments of what counts as the empirical. In Sahlins's and Obeyesekere's accounts, people think within schemes that are elastic, but not dynamic or diachronic. We can use Merry's call for temporal accounting to consider how the invasion biologists whom we have met so far think about time. These scientists have a sense of time as layered, to be sure, but hold fast to nature and culture as 'contexts' for slicing up history. Thus, the earliest species to arrive in Hawaii, brought through the agency of birds, do not count as 'introductions', but as endemic and indigenous, native.<sup>12</sup>

Let me conclude this section with a tale about Nainoa Thompson:

In mid-April 1995, the traditional Polynesian sailing canoe, *Hokule'a*, and its five sister canoes had set sail for Hawaii from French Polynesia. The crew members were retracing the migration route that some of their Polynesian ancestors had taken many centuries before in similar vessels. But just a day short of completing their 6,000-mile voyage, the canoes stopped ... Crew members had been bitten by midges. After radioing to Hawaii for advice and consulting with his crew, the *Hokule'a's* master navigator, Nainoa Thompson, and the captains of the other canoes made the decision to come to about 200 miles from the Big Island of Hawaii. They halted at such a distance to ensure that the wind couldn't possibly blow any stray midges to land; then crew members gathered every bit of organic matter on that boat that could harbor midge larvae and heaved it overboard. Meanwhile a Coast Guard plane flew out from Hawaii and airdropped canisters containing cans of aerosol insecticides. Crew members sprayed their big, double-hulled canoes inside and out ... Outside the port, the voyagers stopped again. A fumigation team met the boats and tented them. Only then did *Hokule'a* enter the harbor ... The object of all these precautions was a gnatlike insect almost too tiny to see: a midge called a punkie. These wee beasties had stowed away on the sailing canoes in the Marquesas, where the punkies have tormented people for decades (Devine 1998: 260-1).

In this episode, we see a fluid stratigraphy of time, nature, and culture. *Hokule'a* re-enacts an historic voyage using contemporary technologies to re-create the floating ecosystems of ancient canoes. Rather than see this as generative of contradictions between nativeness and the exigencies of the contemporary, we could think about how tradition travels through time; 'reinvention' is not the only term to describe what is happening (Finney 1994). As educator Manulani Meyer writes, 'Hawaiian epistemology is a long-term idea that is both ancient and modern, central and marginalized ... It shifts, it is metamorphosed, it is changed by time and influence' (2001: 126). It is this flexible view of time that suffuses the work of the next set of scientists of whom I write, for whom 'context' is not always an *a priori* condition, but might rather be seen as an outcome.

### **Alien algae**

Many haole scientists whom I interviewed were cautious when speaking about Native affairs, even as they ventured informed and provocative opinions about how the politics of local nature and culture entered into metataxonomic issues. I became interested in thinking about these issues in a domain where Native Hawaiian practice might be more directly entangled with science. I found that zone in discussions of 'alien algae'.

Rebecca, an undergraduate working at the Waikiki Aquarium, monitors the growth of invasive algae off Waikiki beach. Having met Rebecca on an oceanographic cruise, I took her up on her offer to lead me on an underwater expedition looking for alien algae. After we donned our snorkels and waded into Waikiki's waters, she pulled out of the ocean a sample invasive species, *Gracilaria salicornia*, a knobby-tipped macroalga recognizable by its orange-brown colour and clump-forming morphology. This was a species indigenous to the Philippines, introduced to Hawaii in the 1970s by a university botanist experimenting with aquaculture of this species for carageenan. The plan was to promote *Gracilaria salicornia* in the South Pacific, where it might be grown as a profitable crop. But while the *Gracilaria* experiment was started, it was never properly finished; the algae were abandoned in the water. Over the years, the seaweed grew and formed tumbleweeds that travelled to various places around O'ahu.

Rebecca pointed out a green filamentous alga that looked like a tangle of fettuccini, *Ulva reticulata*; this species was growing abundantly, attached to *Gracilaria salicornia*. As we glided over *Gracilaria*-covered coral, the water began to look murky. Surfacing, Rebecca pulled up more alien species, including *Acanthophora*, a spiny seaweed brought by barge from Guam in the 1950s. Algal identification, she said, is mostly done phenotypically, in the water, although there are algae that are difficult to identify while wet. Some algae can only be identified on land, under a microscope. As we proceeded farther from shore, we saw occasional living coral, though what was more impressive was a sense that we were looking at a vast coral graveyard, a landscape of sculptural forms flowing into one another like porous bones, written over by the agency of algae.

Back on shore, Rebecca told me about Aquarium-sponsored events aimed at cleaning up alien algae (see Fig.). Scuba volunteers begin by collecting large fragments of free-floating algae. Snorkellers yank it up and place it in rafts. On the beach, volunteers pull it out in bucket brigades. The process can involve a hundred people. Flyers advertising these events pitch them as community gatherings. In these clean-ups, researchers find native species alongside those that are alien, and one native species in particular – *Gracilaria coronopifolia* – is sought as it is used in poke, a popular marinated raw fish and seaweed dish. Rebecca told me, 'When we do the alien algae clean-ups in front of the Waikiki Aquarium, this is the primary species that we retrieve and return to the water so it can continue to grow'. Rebecca's words hint at how algae are linked to local practice.

It is in practice that Linnaean and local taxonomies interact. I read about Hawaiian taxonomic systems in a book by the world expert on Hawaiian algae, Isabella Abbott, a Chinese-Hawaiian phycologist and ethnobotanist. Stating that '[all edible] algae had Hawaiian names before Western science started to describe and name them' (1999: 9), Abbott reports that, about a century ago,

Minnie Reed, a science teacher at the Kamehameha Schools, made a significant contribution to the knowledge of Hawaiian *limu* by emphasizing taxa used for food by Hawaiians ... For all these taxa, she listed Hawaiian and scientific names ... The listing of Hawaiian names was particularly important, for at that time the students in local public schools were sometimes punished for speaking their native language (1999: 10).



FIGURE. Logo for Waikiki Alien Algae Clean-up Event, 17 May 2003.

Abbott offers an historical accounting of classifications of limu:

The word *limu* has come to mean ‘edible algae,’ although the original meaning, according to Hawaiian dictionaries, applies to edible and nonedible organisms growing in wet or damp places with, generally speaking, relatively simple structures. Aside from the edible algae, these include animals such as the toxic soft coral *Palythoa*, known as *limu-make-o-Hana* (the deadly *limu* of Hana), all jellylike lichens and fungi, and certain liverworts (1999: 8).

In spite of this transformation in meaning, Abbott points out that Native names for limu have been stable compared to scientific ones: ‘It is ironic that, through oral traditions, the Hawaiian names have been perpetuated and usually *accurately applied* to the individual species, whereas three-fourths of the scientific names have been changed in the 90 years since Reed published them’ (Abbott 1999: 10, emphasis in original). This irony was not lost on me after Richard Archer, my molecular biologist interlocutor at the University of Hawaii, told me that DNA fingerprints and genetic primers would finally ‘pin down’ identities of Hawaiian plants.

When I visited the Waikiki Aquarium, I heard Abbott’s observation repeated by resident scientist Cindy Hunter: scientific names are constantly changing – as scientists veer from morphological to reproductive characteristics to genetics and back. Hunter said one must always think about alien species as

case-specific – and even within the same case, definitions of good or bad might differ markedly (see Sagoff 2000). As one of the organizers of the alien algae clean-ups, Hunter, a haole woman, had an astute sense of the contingency of how aliens are evaluated; again, much depended on ‘context’. One of the most publicized fights against alien algae took place in an artificial lake on O‘ahu and was aimed at protecting introduced sport fish! Some introduced species have appealing applications for Native Hawaiians; Hunter reported that one invasive species dredged up during clean-ups was favoured by taro farmers for use as a fertilizer.

Hunter invited me to an Aquarium workshop aimed at introducing high-school teachers to a culturally informed science curriculum about algae. There, an education professor told me that we were going to hear about a ‘Trojan horse for getting Hawaiian knowledges into the classroom’. The Hawaiian renaissance of the past couple of decades – which has drawn attention to the political-economic and colonial plight of Native Hawaiians/Kanaka Maoli (H.-K. Trask 1993; M. Trask 1998) and awakened interest in indigenous knowledge systems – would now influence science education. The professor, a woman of Chinese descent, told me that Hawaiian knowledge about limu had historically been women’s lore, passed from mother to daughter. Later, I found this account:

[M]any plants and animals were forbidden to women to touch (taro, *Colocasia esculenta*, the body form of the god Kane) or eat (taro, coconut, shark, turtle, whale, dolphin, and other foods). It has been suggested that, except for big fish and large mammals, anything in the sea was *noa*, or free from *kapu*, so women became the specialists of *limu* (algae) and small invertebrates, which they came to name, recognize and harvest. When native Hawaiians were asked for native names of *limu*, men told the interviewers to ask women, because they were the ones who recognized the species and could give the names for them (Abbott 1999: 9, references omitted).

Retrieving this knowledge would not only be of interest to Native politics, I was told, but could also be a feminist issue. Hunter took the floor and spoke about joining ‘indigenous knowledge with Western science so that we can *malama* [care for] our natural resources’.

About thirty high-school teachers were in attendance, most in their 30s or 40s and most women. The room held a mix of haoles, ‘locals’ – a term referring to people of ‘Asian’ ancestry who grew up in the archipelago<sup>13</sup> – and a few Native Hawaiians. We were all given plastic bags and sent to the ocean in front of the Aquarium, where I had snorkelled with Rebecca, and told to gather limu. Participants kicked off their sandals and waded. Some searched by colour, others by shape. A few spoke together in Hawaiian.

In the classroom, we were led by a haole science instructor (a self-described ‘limu lady’) through a curriculum called ‘Investigating Limu’. In the first unit, ‘Looking at Limu’, we were divided into four groups. Arrayed around the room were twelve bowls, each containing a different limu. We were to match descriptive cards with each sample. Hunter commented that ‘the point is to get the word out about aliens, but you need to know the natives first’. Each card gave us a Hawaiian name, a scientific name, the habitat of the limu, and a clue about what it should look like. Someone exclaimed, noting that one card lacked a Hawaiian name, ‘Does it have a Hawaiian name? No, it’s alien!’

Although I didn't see anyone put the limu in their mouths, we were told, 'Some clues are in taste'.<sup>14</sup>

The curriculum designer asked our opinion about the exercise. One Native Hawaiian teacher said she wondered why we needed to match samples with scientific names; it made her think the best way to do this project would be to look stuff up in books! The education professor agreed, 'We want the kids to observe closely, which is what scientists would do'. The teacher said it would be interesting to have kids sort the limu, come up with their own classification, see how it matched the scientific categories. Why, she suggested, should we always accept the authority of science?

Hawaiian limu names were linked by participants to cultural uses – in eating, in medicine, in family activities. People familiar with these smiled when they identified their favourite limu and shook their heads when they came upon alien algae, often repeating the story of the aquaculture experiment gone wrong. One Native Hawaiian teacher, identifying *Kappaphycus*, recognized it as an introduced alga that had caused distress to Kane'ohe Bay, a site of ancient Hawaiian fishponds, and expressed incredulity that haole biologists had been arrogant enough to experiment with this plant. Participants slid between taxonomies, thinking through their experiences, positive, negative, indifferent, using both Linnaean and Hawaiian names. In no case did people identify plants themselves as agents of invasion; attention was always on those whose ignorance or hubris had been the impetus for travel.

When, sometime later, I had lunch with Isabella Abbott, I got a new angle on these matters. Abbott frowned when I asked about alien species. Even though she had once written an article entitled 'There are aliens among the algae, too – or Limu malihini' (1987) she was impatient with language of alienness, telling me that 'there is so much work to do on indigenous species'. She said that she had named six new species in the last year. In her book, she cautioned, '[W]e have not exhausted the Hawaiian marine flora' (Abbott 1999: 11). There are more data to be examined before jumping to conclusions. Sampling is incomplete; some places are hard to get to for humans, though easy for algae. 'Since 1997,' Abbott told me, 'I've received collections from the Northwest Hawaiian Islands'. Someone from the National Marine Fisheries was picking up lobster traps and thought Abbott would be interested in classifying seaweed on them. She told me:

I have found extended distributions of these seaweeds; I have found that they are more widespread – like from Hawaii to Australia – and they may be connected not by currents [specific to hemispheres] but by eddies [which can cross hemispheres]. I'd rather find *that* than find a new species. It makes this big world smaller. And it means that we phycologists have to get along. So, alien species? I'd prefer to be quiet until I have more information.

Twenty-five years ago, at meetings of the Hawaiian Botanical Society, Abbott 'objected to the word alien. It reminded me of all these aliens from outer space'. The fellow who introduced the word said, 'That's why I like it!' He wanted people to get concerned. But Abbott felt the term assumed phycologists already knew everything about the distribution of plants and were now risking transposing their own values (and ignorance) onto the nature of plants themselves.

So, how do *these* people, these scientists and science teachers interested in algae, think about natives? They think of limu as bound up with Native ways of life and with the Hawaiian renaissance. And these ways are dynamic, not a static tradition to be retrieved or reinvented. Returning to McClatchey on bioprospecting, in which he argues that a 'natural inheritance' can be 'developed over ... history', we could think of relations with 'native' algae, in the words of Meyer, as 'metamorphosed, ... changed by time and influence' (2001: 126). Such a view, in which 'context' is produced rather than posited at the outset, is in tension with what Archer argued to me about algal systematics:

The memories of the true identity of organisms is really fragile. People's perceptions change over time. Native Hawaiians sometimes used different names for the same cultivars and the same names for different cultivars, because they based names on colour, texture, taste, gestalt, etc. In our research, we want to resolve the confusion of names, and DNA forensics can help. DNA is a real good tool to sort these things out.

With molecular data, he told me, scientists sequence genes and 'find out where things originally came from'. But this origin would be one grounded in partitioning nature and culture, assigning 'origin' only to a nature that does not include humans. In the limu lesson, humans are crucial players in creating the taxonomies that make limu as such appear.

### **The alien versus the amphidromous**

Bishop Museum biologist Ron Englund, careful not to speak for Native Hawaiians, directed me to someone who might speak for a constituency interested in the fate and uses of Hawaiian marine creatures: Kaipō Faris, a Native Hawaiian who has been instrumental in reviving taro farming on the windward side of O'ahu. The town where he lives, Waiahole, has been at the centre of the 'Waiahole Water Fight', a dispute in motion since the 1990s about the flow of water from the Ko'olau mountain range through the Waiahole stream. The Waiahole stream historically travelled down the windward side of O'ahu, but, with the rise of sugar plantations in 1916, in what was heralded in the American press as a feat of engineering, but regarded by taro farmers as a theft of their waters, the stream was diverted to the leeward side to irrigate commercial crops. This diversion deprived windward farmers of water that they had used for taro fields. Before diversion, 30 million gallons flowed down the mountain a day; eighty years later, this had slowed to 3 million. In the 1990s, when sugar plantations began to close, a movement arose to channel water back to earlier paths.

People in the Waiahole water movement undertook historical and legal investigations to find out where taro used to grow and how streams once flowed, while the corporate interests of the Robinson Estate, Campbell Estate, and American Factors fought these activists, trying to keep water moving leeward toward tourism, development, and golf courses (Scheuer 2002; Turner 2002). In 2000, the Hawaii Supreme Court decided in favour of the call to revert Waiahole water back to its historical path. Earth Justice documents the case:



[T]he Court vacated permits the Commission had issued to leeward interests and directed that the Commission reevaluate the level of flow that must remain in windward streams. Small family farmers and Native Hawaiians, through the Waiāhole-Waikāne Community Association, Hakipu'u 'Ohana, and Kā Lahui Hawai'i, sought to restore streams that had been diverted for eighty years by central O'ahu sugar plantations. Healthy stream flow is needed for 'instream uses' – to restore native stream life, such as 'o'opu and hihīwai; protect traditional and customary Native Hawaiian gathering rights; support the productivity of the Kāne'ohe Bay estuary; and preserve traditional small family farming, including taro farming (quoted in Costanzo in preparation: 111, references omitted).

Faris became involved in the Waiāhole project in the 1990s. His interest in taro farming led him to look at streams that might irrigate the fields – and, in that connection, at creatures living in streams. One important creature is the limpet, which comes in three varieties: hihīwai, hapawai, and pipiwai. These are molluscs classed by habitat, from up to downstream: hapawai, for example, translates as 'half water', indicating that it lives halfway up the stream. These organisms are *amphidromous* – creatures born in fresh water that in their larval stage go out to sea, becoming part of the plankton, and then return to fresh water for the remainder of their lives. In their early days, they look like jellyfish. When they circuit back to fresh water, they metamorphose, forming a shell, and crawl upstream. These creatures living in Hawaii's streams and oceans have been endangered because their habitat has been reduced (they like swiftly flowing waters, not trickles, in freshwater streams). Faris found a number of hihīwai on the island of Moloka'i and brought them back to O'ahu to place in Waiāhole stream, as a measure of the health of the water – to provide evidence that the streams were no longer healthy in the wake of massive water diversion.<sup>15</sup> As he told me, 'I'm not a scientist, but I grew up with my grandparents and they taught me that the best indicator of a healthy stream is the native life that is in it'.

Corporate lawsuits tried to block Faris's restorative placement of the hihīwai into the stream, arguing that he was aiding an 'alien introduction'. Faris maintained that these organisms were endemic to the Hawaiian archipelago, and that this should count rather as a 'reintroduction'. After research into how he might prove this claim, he sent samples to Louisiana State University for genetic studies, undertaken in January 1999 by biology professor John Michael Fitzsimmons and graduate student Melanie Bebler (Fitzsimmons 2001). As Faris informed me, these tests indicated there were no genetic differences between Moloka'i and O'ahu limpets. He called upon genetics to underwrite a project connected to imperatives of Native Hawaiians; unlike Richard Archer, the molecular biologist who argued that Hawaiian names should be replaced with scientific names based on DNA, we find here an activist using both classificatory systems in concert. Faris's was a use of genetics to wage a claim about the indigeneity of marine creatures, a language that the courts, fond of DNA evidence, could understand.

Implicit in Faris's work is an argument that the waters between islands are part of Hawaii and can be shown to be such through delineation of a biogenetic kin network for limpets. Following Boellstorff (in press), who has written of the 'archipelagic concept' tying together nationalist framings of Indonesia, we can detect an archipelagic imagination mobilized in the service of a project of indigenous resistance – and a project of amplifying what counts

as ‘endemic’. Once ‘nativeness’ is sited in a network of fresh and salt water, attention shifts from land to the fluid domain of the sea.<sup>16</sup> Terms of debate about nativeness transform when transported into water.<sup>17</sup> Archer’s complaints about the pliability of ‘native tradition’ do not acknowledge that something can be both native and mobile, as we see in this instance of a metamorphosing mollusc. In the Pacific, activist links between Native people and water may be politically easier to secure than landed claims; Native territorializations of the sea may work in part because the ocean has been historically regarded as *aterritorial* by the European powers that colonized this part of the world (Hau’ofa 1993). It is no coincidence that Native Hawaiian nationalism has the voyaging canoe as one of its symbols (Finney 1994). The canoe might be joined by the humble limpet as an organic symbol of such *amphidromous politics*.

### The parameters of taxonomies

So, how do scientists think: about ‘natives’, for example? Much relies on their view of nature, culture, and agency. For many scientists, humans are either distinct from nature by virtue of culture or are all equally part of nature. Others have a more fluid account of how ‘nature’ and ‘culture’ are entangled with organic and social history.

The evolutionary biologists whom I interviewed for the first portion of this article viewed the question of native and alien as *metataxonomic* – an issue about categorical frames transcending existing classifications. Scientists holding to this view enumerate properties characterizing invasive species, hoping to work backwards from cryptogenic creatures to stable Linnaean moorings. At times, though, they may say that the issue cannot be so neatly adjudicated; what is or is not invasive – and, indeed, ‘alien’ – *depends on ‘context’*. Scientists like Abbott and those leading the limu lesson (along with people like Faris, who make detours into science), meanwhile, frame the issue as one of *parataxonomies* – setting scientific and Hawaiian taxonomies *alongside* one another (to draw on a meaning of the Greek *para*), sometimes allowing for translation of one into the other, but not always. We might think of the parallel classifications offered in the limu lesson as animated by *parataxis*: ‘the placing of propositions or clauses one after another, without indicating by connecting words the relation (of coordination or subordination) between them’ (*OED*). If we think of a taxonomy as a *proposition* – ‘something put forward as a scheme’ (*OED*) – *parataxonomies* become paratactical principles of classification that can coexist without necessarily being squared with one another. It should be clear that the metataxonomic conundrums faced by the invasion biologists are also, in their way, parataxonomic (and, etymologically, since *meta* means ‘with’ or ‘after’ rather than ‘above’, this is not surprising).<sup>18</sup> On this view, ‘context’ might be reimagined not so much as ‘the parts which immediately precede or follow any particular passage or ‘text’ and determine its meaning’, but rather, in tune with an obsolete but useful meaning, as a ‘weaving together’ (*OED*), a weaving that happens contingently, not deterministically; as when ‘alien algae’, for example, are written into Native farming, or genetics is stitched into amphidromous belonging.

The short answer to how scientists think about ‘natives’ is now: within parameters – not ‘contexts’ – of time, agency, and the politics of nature and culture in particular places. If invasion biologists are after empirical descriptions of the world, we should remember that, as Meyer argues in ‘Our own liberation: reflections on Hawaiian epistemology’, ‘empiricism is culturally defined’ (2001: 145). And culture, as Sahlins reaffirms, is crucially about ‘the organization of human experience and action by symbolic means’ (2000: 158). The parameters of invasion biology are organized by such means, by how scientists think: about ‘aliens’, for example.

## NOTES

Thanks to Isabella Abbott, Pamela Ballinger, Cari Costanzo Kapur, Kaipo Faris, Ilana Gershon, Carina Johnson, Bill Maurer, Rebecca Most, Heather Paxson, and Susan Silbey for commentary. I am grateful to those at the Bishop Museum, Waikiki Aquarium, and the University of Hawaii who shared their research with me. I thank the Wenner-Gren Foundation for Anthropological Research, which funded this research with Grant # 6993.

<sup>1</sup> I use ‘Hawaii’ to refer to the entire archipelago and ‘Hawai’i to refer to the island by that name, as has become common in Hawaiian studies (Sahlins 1995: 17 n. 1). I retain alternative usages when quoting from sources employing other conventions.

<sup>2</sup> <http://www.state.hi.us/dlnr/dar/pubinfo.htm>, accessed 31 October 2003.

<sup>3</sup> ‘Hawaiian words are not italicized as foreign words in this text because, following the usage adopted by the editors of the 1997 issue of *Social Process in Hawai’i* (vol. 38), I recognize the Hawaiian language as indigenous to the place I am writing about rather than the language of a foreign country’ (Merry 2000: xiii). Hawaiian orthography often makes use of diacritics. Many scholars are dropping these. I do so here.

<sup>4</sup> [http://www2.bishopmuseum.org/HBS/invert/list\\_home.htm](http://www2.bishopmuseum.org/HBS/invert/list_home.htm), accessed 26 January 2004.

<sup>5</sup> The chain began to emerge 5.6 million years ago.

<sup>6</sup> <http://www.bishopmuseum.org/about.html>, accessed 26 January 2004.

<sup>7</sup> A similar taxonomy animates Englund & Baumgartner (2000).

<sup>8</sup> See Kirch (2000) on pre-Cook agricultural intensification. Kirch argues that early terracing practices in Hawaii were often harmful to local landscapes.

<sup>9</sup> ‘Richard Archer’ is a pseudonym. I was unable to secure permission to use this scientist’s real name before this article went to press.

<sup>10</sup> See Chapter 107 of Title 13, Hawaii Administrative Rules, adopted 15 May 1997, online at <http://www.state.hi.us/dlnr/dofaw/rules/Chap107.pdf>, accessed 4 December 2003.

<sup>11</sup> Boundaries between nature and culture are further blurred when ecologists argue that anthropogenic global warming promotes range extensions for marine organisms (Carlton 2000).

<sup>12</sup> This is because birds are part of ‘nature’. But, with apologies to Bulmer’s ‘Why is the cassowary not a bird?’, might we not question this scheme and ask, of the first agent of Hawaiian introduction: why is that emissary not a bird?

<sup>13</sup> Much Asian immigration to Hawaii – from, prominently, China, Japan, and the Philippines – occurred in the first half of the twentieth century, when Hawaii was a United States territory. These immigrants did not consider themselves Americans – not least because early Asian exclusion acts prevented them from naturalizing as citizens – and after Hawaiian statehood, in 1959, they and their descendants did not adopt the term ‘Asian-American’, which became popular among post-1965 immigrants to mainland states (Okamura 1994).

<sup>14</sup> Taste opens up questions of food traditions. In Hawaii, seaweed is food not just for Native Hawaiians, but also for Filipinos, Japanese, Chinese, Koreans, and haoles. Taxonomies by these groups – some *Gracilaria* are called *ogo* in Japanese – may not align with scientific or Native Hawaiian terms; what is ‘native/alien’ might also vary (see Abbott 1978). The privileging of Hawaiian names in the limu curriculum stakes an unmistakable political claim.

<sup>15</sup> <http://www.pixi.com/~isd/MakawaiHihiwai.html>, accessed 26 January 2004. The state of the stream affects limu also. Having less mixed fresh and salt water – muliwai – in estuaries of Kaneohe Bay means less waewaeiole, an important limu.

<sup>16</sup>To say nothing of rivers! 'Rivers ... are both guardians and betrayers of places. And, what's more, despite often being themselves the borders that make places, they are places too, as mobile as can be' (Raffles 2002: 182).

<sup>17</sup>Contrast the symbolic valences of fluid 'nativeness' in the sea with 'grounding' claims made by some nationalists that Cyprus is Turkish because 'in geological terms, the island of Cyprus can be seen as a breakaway fragment of the Anatolian mainland' (Bryant 2002: 523).

<sup>18</sup>Bill Maurer puts a related argument this way: 'The kind of engagement I am after is not, then, a quest for a critical metalanguage. It is rather a parallel endeavor to the knowledge productions of others, a paratactical language ... that reaffirms relation but does not specify the quality of that relation in advance' (2003: 780). We must modify Russian linguist Valentin Vološinov's argument, in the 1920s, that '[c]ontexts do not stand side by side in a row, as if unaware of one another, but are in a state of constant tension, or incessant interaction and conflict' (quoted in Raffles 2002: 30), to argue that 'context' is rather a *product* of interaction, and only one possible product at that.

#### REFERENCES

- Abbott, I. 1978. The uses of seaweed as food in Hawaii. *Economic Botany* **32**, 409-12.
- 1987. There are aliens among the algae, too – or Limu malihini. *Hawaiian Botanical Society Newsletter* **26**, 60-3.
- 1999. *Marine red algae of the Hawaiian Islands*. Honolulu: Bishop Museum Press.
- Boellstorff, T. in press. *The gay archipelago: sexuality and nation in Indonesia*. Princeton: University Press.
- Borofsky, R. 1997. Cook, Lono, Obeyesekere, and Sahlins. *Current Anthropology* **38**, 255-82.
- Bright, C. & L. Starke 1998. *Life out of bounds: bioinvasion in a borderless world*. New York: Norton.
- Bryant, R. 2002. The purity of spirit and the power of blood: a comparative perspective on nation, gender and kinship in Cyprus. *Journal of the Royal Anthropological Institute* (N.S.) **8**, 509-30.
- Bulmer, R. 1967. Why is the cassowary not a bird? A problem of zoological taxonomy among the Karam of the New Guinea Highlands. *Man* (N.S.) **2**, 5-25.
- Carlton, J.T. 2000. Global change and biological invasions in the oceans. In *Invasive species in a changing world* (eds) H.A. Mooney & R.J. Hobbs, 31-53. Washington, D.C.: Island Press.
- Costanzo, C. in preparation. *Race, rights, and resistance: constructing identities in contemporary Hawai'i*. Dissertation, the Department of Cultural and Social Anthropology, Stanford University.
- Cox, G.W. 1999. *Alien species in North America and Hawaii: impacts on natural ecosystems*. Washington, D.C.: Island Press.
- Devine, R.S. 1998. *Alien invasion: America's battle with non-native animals and plants*. Washington, D.C.: National Geographic Society.
- Douglas, M. 1966. *Purity and danger*. London: Ark.
- Englund, R.A. & E. Baumgartner 2000. A fang-toothed blenny *Omobranchus ferox* from Pearl Harbor, O'ahu, a probable unintentional introduction to the Hawaiian Islands. Records of the Hawaii Biological Survey for 1999, Part I: Notes. *Bishop Museum Occasional Papers* **64**, 61-3.
- Finney, B. 1994. *Voyage of rediscovery: a cultural odyssey through Polynesia*. Berkeley: University of California Press.
- Fitzsimmons, J.M. 2001. Hawaiian stream fishes and the mauka-makai connection. Valdosta State University, Valdosta, Georgia, 5 April.
- Hau'ofa, E. 1993. Our sea of islands. In *A new Oceania: rediscovering our sea of islands* (eds) V. Naidu, E. Waddell, & E. Hau'ofa. Suva: School of Social and Economic Development, USP. (Reprinted in *The Contemporary Pacific* **6**, 147-61, 1994.)
- Helmreich, S. 2003. Trees and seas of information: alien kinship and the biopolitics of gene transfer in marine biology and biotechnology. *American Ethnologist* **30**, 341-59.
- Hobsbawn, E. & T. Ranger (eds) 1983. *The invention of tradition*. Cambridge: University Press.
- Ingold, T. 1990. An anthropologist looks at biology. *Man* (N.S.) **25**, 208-29.
- Kauanui, J.K. 2002. The politics of blood and sovereignty in *Rice v. Cateyano*. *Political and Legal Anthropology Review* **25**, 110-28.
- Kirch, P. 2000. *Historical ecology in the Pacific Islands*. New Haven: Yale University Press.

- McNeely, J.A. 2000. The future of alien invasive species: changing social views. In *Invasive species in a changing world* (eds) H.A. Mooney & R.J. Hobbs, 171-89. Washington, D.C.: Island Press.
- Maurer, B. 2003. Got language? Law, property, and the anthropological imagination. *American Anthropologist* **105**, 775-81.
- Merry, S.E. 2000. *Colonizing Hawai'i: the cultural power of law*. Princeton: University Press.
- Meyer, M.A. 2001. Our own liberation: reflections on Hawaiian epistemology. *The Contemporary Pacific* **13**, 124-48.
- National Centre for Aquatic Biodiversity and Biosecurity, New Zealand 2002. *Aquatic Biodiversity and Biosecurity Newsletter* 1.
- Obeyesekere, G. 1997. *The apotheosis of Captain Cook: European mythmaking in the Pacific*. Princeton: University Press.
- Okamura, J. 1994. Why there are no Asian Americans in Hawai'i: the continuing significance of local identity. *Social Process in Hawai'i* **35**, 161-78.
- Pimentel, D. (ed.) 2002. *Biological invasions: economic and environmental costs of alien plant, animal, and microbe species*. Boca Raton, Fla.: CRC Press.
- Raffles, H. 2002. In *Amazonia: a natural history*. Princeton: University Press.
- Ritvo, H. 1997. *The platypus and the mermaid, and other figments of the classifying imagination*. Cambridge, Mass.: Harvard University Press.
- Sagoff, M. 2000. Why exotic species are not as bad as we fear. *Chronicle of Higher Education* **46**: 42, B7.
- Sahlins, M. 1995. *How 'natives' think: about Captain Cook, for example*. Chicago: University Press.
- 2000. 'Sentimental pessimism' and ethnographic experience; or, why culture is not a disappearing 'object'. In *Biographies of scientific objects* (ed.) L. Daston, 158-202. Chicago: University Press.
- Scheuer, J.L.L. 2002. *Water and power in Hawai'i: the Waiahole water case and the future of the islands*. Dissertation, Department of Environmental Studies, University of California, Santa Cruz.
- Sprugel, D.G. 1991. Disturbance, equilibrium, and environmental variability: what is 'natural' vegetation in a changing environment? *Biological Conservation* **58**, 1-18.
- Staples, G.W. & R.H. Cowie (eds) 2001. *Hawai'i's invasive species*. Honolulu: Mutual Publishing/Bishop Museum Press.
- Strathern, M. 1991. *Partial connections*. (ASAO special publications **3**). Lanham, Md.: Rowman & Littlefield.
- Subramaniam, B. 2001. The aliens have landed!: Reflections on the rhetoric of biological invasions. *Meridians: Feminism, Race, Transnationalism* **2**: **1**, 26-40.
- Trask, H.-K. 1993. *From a native daughter: colonialism and sovereignty in Hawai'i*. Monroe, Maine: Common Courage Press.
- Trask, M. 1998. Advocacy and resistance in Hawai'i. *Resist newsletter* **7**(7) (available on-line: <http://resistinc.org/newsletter/issues/1998/09/arh.html>, accessed 6 March 2004).
- Tsing, A.L. 1995. Empowering nature, or: some gleanings in bee culture. In *Naturalizing power: essays in feminist cultural analysis* (eds) S. Yanagisako & C. Delaney, 113-43. New York: Routledge.
- Turner, T. 2002. *Justice on Earth: Earthjustice and the people it has served*. Chelsea Green.
- Van Driesche, J. & R. Van Driesche 2000. *Nature out of place: biological invasions in the global age*. Washington, D.C.: Island Press.

## **Comment pensent les scientifiques, par exemple à propos des « indigènes » : problématique taxonomique dans la biologie des espèces exotiques à Hawaï**

### *Résumé*

L'auteur s'intéresse à la manière dont les biologistes étudiant les espèces « invasives » à Hawaï classifient, notamment dans les eaux épistémologiquement troubles de l'archipel, les organismes « indigènes » et « exotiques ». En plaçant l'analyse dans le cadre du débat entre Sahlins et Obeyesekere, l'article esquisse l'idée que loin d'être une simple question de définition biologique, cette classification met à jour une problématique politique et taxonomique, en particulier à Hawaï où le mot « indigène » est associé à des descripteurs utilisés par et pour

les autochtones de l'archipel. Sur les bases d'une recherche ethnographique dans les univers imbriqués des biologistes de la vie marine, d'une part, et des éducateurs et activistes hawaïens d'autre part, l'article examine les frontières fluctuantes de la nature, de la culture, de l'intentionnalité et du temps dans la pratique classificatrice de la « biologie de l'invasion ». A travers le cas particulier des descriptions des « algues exotiques » et des crustacés amphidromes, l'article explore la manière dont le « contexte » encadre diversement la description des créatures marines indigènes et exotiques à Hawaï. L'auteur conclut par une réflexion sur les modes de classification *métataxonomique* et *parataxonomique*.

*Anthropology Program, Room 16-267, Massachusetts Institute of Technology, 77 Massachusetts Avenue, Cambridge MA 02139-4307, USA. sgh2@mit.edu*