Tourism as Science and Science as Tourism

Environment, Society, Self, and Other in Papua New Guinea

by Paige West

The experience of villagers in Maimafu, in the Crater Mountain Wildlife Management Area of the Eastern Highlands of Papua New Guinea, calls attention to two forms of social interaction between rural people and outsiders that have been little examined in the anthropological literature. One of these is scientific research and the other is scientific tourism, a form of ecotourism that is linked not to science but to self-fashioning and individual gain. Scientific tourists may be seeking an educational adventure that they can turn into symbolic capital on their return home, a way into the world of science, or an experience that can be turned into economic capital through publication in popular magazines. For both researchers and scientific journalists, New Guinea combines the exotic, the about-to-be-lost, the primitive, the untouched, and the spectacular and is therefore a powerful space for imaginary and representational practice.

Two social forms that move people from the more cosmopolitan parts of the world to the less remain largely underexamined in the anthropological literature. The first is "scientific tourism," and the second is scientific research that brings some of the benefits associated with economic development.[1] In Papua New Guinea both scientific tourism and scientific research can be considered social interactions through which rural peoples and their interlocutors come to understand place, self, and other, and together they constitute a powerful site for the analysis of discourse, power, and cross-cultural self-fashioning. Both social forms depend on the intertwining of commerce, imagination, and science. Commerce is important because there are always markets for new forms of tourism and stable and secure sites for scientific research. The imagination is important because for many Papua New Guinea is "the beyond," an imaginary frontier based on dreams and desires but not reachable in any real sense because, as an image created by fantasy, it is destroyed and replaced by a new dream once it is nearly attained (Crapanzano 2003, 15–17). Science is important because it is from its social power—its ability to capture and create commercial opportunities and its hold on the global understanding of how the world is to be explained, ordered, legislated, and controlled (Martin 1998, 25; Rabinow 1996, 91–111)—that these new social forms have emerged.

In what follows I describe three sets of scientific tourists that visited Maimafu, a village located in the Eastern Highlands Province of Papua New Guinea whose residents hold much of the land that is encompassed by the Crater Mountain Wildlife Management Area (CMWMA).[2] The first scientific tourists were postgraduates from a large European university who came to generate ideas for their applications to Ph.D. programs. The second were self-identified "travelers" who came to "conduct scientific research" on tree kangaroos and who published their "results" in a popular magazine. The third were British university students who came on a university-sponsored trip. I compare their visits with the multiple visits of scientists working through the Research and Conservation Foundation (RCF) of Papua New Guinea and the Wildlife Conservation Society–Papua New Guinea (WCS-PNG), the two long-standing nongovernmental organizations that manage and administer the CMWMA and its research facilities. These scientists come to Crater Mountain to "collect data that is used to promote knowledge in free and open exchange" and along the way contribute to the economic development of the villages and the regional and national economies (Mack and Bino 2003, 1). Before I present the ethnography of science and tourism at Crater Mountain, I discuss why examining the intersection of commerce, the imagination, travel, and science is important for anthropol-

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1. The term "scientific tourist" was introduced into the literature on tourism in the late 1980s (Laarman and Perdue 1989) but was used first in 1881 as the title of a guidebook to scientific curiosities in Britain (Walford 1818).

2. The CMWMA is 60 km southwest of Goroka, the capital of the Eastern Highlands Province, and covers about 2,700 km^2 in Eastern Highlands, Simbu, and Gulf provinces.

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ogists; the role of the image of the primitive in New Guinea and why this is important in understanding both tourism and scientific practice there; and the nexus of the anthropological study of tourism and our study of science and society. I then introduce Maimafu, describe its relation to the CMWMA, and present the ethnographic materials. I conclude with an analysis of the social and economic effects of these underexamined social forms.[3]

Commerce, Imagination, Travel, and Science

Commerce, European imaginings of the natural and cultural diversity in the equatorial world, and science have been intertwined since the beginning of the age of exploration (Boon 1990; Pratt 1991). For many years, the island of New Guinea has drawn adventurers, traders, writers, and scientists who wished to understand, enjoy, and exploit its spectacular nature and culture. Malay explorers first came to the island 2,000 years ago looking for bird of paradise plumes, and Europeans came looking for these same birds in 1522 (Swadling 1996, 53, 64). During the early twentieth century European and American women wore these plumes in their hats, and this consumption resulted in the killing of between 30,000 and 80,000 birds (Swadling 1996, 90). This commercial and aesthetic desire for the birds' plumes was intertwined with the European interest in naming and ordering the natural world (Kirsch 2006, 28), and New Guinea, with its fabulous birds, became a key site for the merging of commerce, science, and imagination.

During his 1854–62 trip to the Malay Archipelago, the celebrated naturalist Alfred R. Wallace (1880) spent time on the island of New Guinea. Wallace imagined the island as "the country of the cassowary and the tree kangaroo," "where the foot of civilized man had never trod," and the home of "the most beautiful of the feathered inhabitants of the earth," the birds of paradise (Wallace 1880, 494). He thought of it as having a dark and remote interior, and even after he realized that the bird of paradise plumes that he had seen on the coasts came through trade routes that ran deep into the interior, he still maintained that the island was untouched by the outside world. Wallace's trip inspired others—naturalists, scientists, journalists, and adventurers—to come to New Guinea (Swadling 1996, 74).

Today birds of paradise in particular and spectacular nature in general continue to bring natural scientists to the island (Kirsch 2006; West 2006*a*). Yet instead of simply relying on the rhetoric of wonder, scientists today draw on the rhetoric of loss (West 2001). For the past 30 years the lands and lives that come to mind when we think of the tropics have been subsumed by a set of rhetorics that center on the loss of the diverse flora and fauna in these seemingly out-of-the-way places. Scientists have been tracking the decline in numbers of species and hectares of forest in these areas for decades, and there is much evidence that the forested world of the past is retreating. This practice of tracking loss is tied to the emergence of biodiversity as a politicized category (Foale and Macintyre 2004, 2). In this field of biodiversity-related practice, nature is imagined as pristine and untouched, and culture is seen as an inevitable threat. Yet this separation of external nature (the world around us in peril) and internal nature (the biodiversity-destroying ways of culture that are assumed to be part of what it is to be human) is nothing new. It mirrors much older divisions of the world around us into "first nature" and "second nature" (by Hegel, for example) and external and universal nature (by Bacon, for example; Smith 1984). The contemporary rhetoric of biodiversity loss has captured the global imagination, and so have the scientists who track its loss.[4] The tropical world has become not only the fantastic "beyond" of Wallace but also the location of a loss that is heartbreaking to upper- and middle-class consumers from the nontropical parts of the world. In addition to this rhetoric of biological loss, New Guinea is subject to one of cultural loss (Gewertz and Errington 1991). This rhetoric turns on the idea of authenticity.

Tourism, Authenticity, and the Primitive

A combination of historic images, mass media, and individual imaginings of exotic nature and culture draws visitors to Papua New Guinea. Scientists, conservation activists, and others want an "authentic" native who lives in an "authentic" and "untouched" nature, and they want the native to fit the stereotypes of "native" peoples that they have been exposed to in undergraduate anthropology classes, on TV programs, in magazines, and in movies. When the real residents of Papua New Guinea do not fit these stereotypes, they are considered not only less authentic but also less deserving of the rights to their traditional lands and livelihood strategies. Through a series of narrative productions conservation-minded people, both European-descended and elite Papua New Guinean, make rural forest-dwelling Papua New Guineans either "authentic" or "inauthentic" (West 2001). After the people are assigned to a "category," they are accorded rights and responsibilities according to a set of rhetorical devices that locate them on a scale assuming a linear progression from indigeneity to modernity. These devices include discourses of parental relations that assign rural peoples the role of "children" who must be helped to understand the modern world and discourses of threat and danger that assign them the role of overpopulating, overharvesting resource users. The assumed

3. I have conducted research in the CMWMA since 1997 with extended stays in 1997, 1998, and 2004 and short (two- to four-month) visits in 2001, 2002, 2003, 2005, and 2007.

4. By calling biodiversity loss a "rhetoric" I do not mean to elide the seriousness of contemporary environmental change in the tropical world. I mean to mark the verbal and written techniques of persuasion that are deployed to shape our understandings of this part of the world.

linear progression locates authentic indigeneity as a prior condition for modernization and links authentic relations with the biophysical world directly to indigeneity. According to conservation activists, as people are moved from indigenous to modern, either by forces beyond human control such as globalization or by their own desire to modernize, they lose the ability to relate to their surroundings in ways that are appropriate for conservation. Yet much conservation intervention often attempts to teach rural peoples how to take part in the modern world so that they will not have to rely on their biophysical surroundings for their livelihoods and therefore will not destroy nature (Holt 2005).

The imaginings that locate people on a scale from indigenous to modern are apparent not only in conservation work but also in tourism. Rupert Stasch (2006, 1), writing about primitivist tourism to the lands of Korowai peoples of West Papua, Indonesia, shows that the "fantasy-formations" of tourists are "acquired and elaborated in tourists' own cultural homes through mass media, through anthropology, through people's own imagining of alternatives to their home cultural lives, and in some cases through prior histories of encounter with people they find to match the stereotypy." The tourists that Stasch spent time with focus on "violence, relation to nature, material technology, racial phenotype, and type of polity" (p. 2) in their assessments of where Korowai fit on a scale similar to the one I mention above. They see the indigenous side of the scale as primitive, and for them primitive is equated with war, hunting, headhunting, and cannibalism.[5] They also imagine their primitive as living in "intimate as well as dangerous" contact with the natural world (p. 3). This is similar to the conservation-related visions. The touristic primitive is also "uncontacted" or only "contacted slightly," and for Stasch's tourists this notion of "isolation" encompasses all of the other attributes that he examines. He argues that the attribute of isolation works to "overtly" implicate the social and personal selves of the tourists in the lives of the Korowari because it is isolation that draws them, but as they come, the Korowari become less isolated. These tourists want to catch people on the cusp of change, just as scientists want to catch ecosystems on the cusp of change. Yet this is not the only point of similarity between tourism and science.

The Anthropology of Tourism and the Anthropology of Science

In papers published in the 1980s scholars called for more anthropological attention to be paid to tourism (Cohen 1984; Crick 1989), and today the discipline boasts a large literature on it (see Burnes 1999; Cohen 1984; Crick 1989; Graburn 1983; Nash 1996; Smith 1977; Stronza 2001). Amanda Stronza (2001) traces the emergence and flourishing of tourism studies in anthropology over the two preceding decades. She points out that tourism is an important subject for anthropologists because it often "involves face-to-face encounters between people of different cultural backgrounds" and, citing Greenwood (1989, 171), that tourism is "the largest scale movement of goods, services, and people that humanity has perhaps ever seen" (p. 264). These frequent cross-cultural interactions are rich sites where we can examine ideas about authenticity, the globally inequitable distribution of money and leisure time, the nexus of economic development and indigenous-rights politics, and the points of agenda articulation between capitalists, governments, and local people. Tourism brings economic change at regional, national, and local levels (Crick 1989; Honey 1999), and it brings social change in terms of acculturation (Stronza 2001), the commodification of culture (Cohen 1988; McLaren 1997), and the creation of social expectations for and of modernity (West and Carrier 2004).[6]

Scholars have identified subcategorical forms of tourism. One of these forms is "alternative tourism," which self-consciously positions itself against traditional tourism (see Wearing 2001; Wearing, McDonald, and Ponting 2005). Alternative tourism can be a guilt-alleviating and prestige-building activity in which tourists work to build their social capital and their personal sense of self (Wearing and Wearing 1999). Within the category of alternative tourism there is a subcategory that is meant to make special use of and contribute to the protection of the natural world—ecotourism.

There is a growing literature specifically focused on ecotourism (e.g., Bandy 1996; Belsky 1999; Chapin 1990; Stronza 2000; West and Carrier 2004; Young 1999; Wearing and Neil 1999; Wearing and Wearing 2001), which is variously defined (Honey 1999, 6–7) but seems always to have some element that includes viewing biological diversity that is either under threat or in a pristine state. This is often coupled with the promise of viewing culture in similar states. While mass tourism was the focus of much anthropological critique in the 1980s and 1990s, ecotourism and other forms of alternative tourism were viewed as a possible corrective to some of the ravages of the uneven development caused by contemporary capitalism (Munt 1994*a*). In what follows I focus on ecotourism because the forms of tourism that I am describing in this paper are manifestations of it.

Well-organized ecotourism enterprises generate about $30 billion a year (Honey 1999, 9). Since the 1990s some conservation-minded activists and conservation scientists have advocated ecotourism as a form of sustainable development for peoples living in tropical forests (see Hartshorn 1995). Today ecotourism continues to be advocated as a means of development for rural peoples even when much of the scholarship concerned with it is pessimistic regarding its

5. Where Stasch's tourists diverge from conservation activists and practitioners is in their imaginings of the gendered nature of the political world of their primitives. They want masculine primitives who express self and political order "through personalities rather than formal institutions" (Stasch 2006, 4). The imaginary primitive of conservation-minded actors in Papua New Guinea is not gender specific.

6. For a comprehensive review of the anthropological literature on tourism in general, see Stronza (2001).

outcomes (King and Stewart 1996), when there are data showing that many of the community-based ecotourism ventures cited as success stories have not had a significant effect on local livelihoods (Kiss 2004; Kruger 2005), and when it has been shown to have a negative effect on biological diversity (Quiros 2005; Savage 1993). Some scholars have shown that ecotourism enterprises disrupt local social and subsistence life (Akama, Lant, and Burnett 1996; Belsky 1999; Koch 1997). Others show that ventures that include natural places and indigenous peoples often inadequately represent indigenous cultures (Dyer, Aberdeen, and Schuler 2003). Ecotourism enterprises often essentialize local or indigenous peoples as noble savages (Hamley 1991) and essentialize nature as untouched by humans (Meyer 1996). Some enterprises commodify the natural and the cultural in ways that change local residents' ideas about their environments and their sociocultural practices without supplying major economic benefits (Carrier and Macleod 2005; King and Stewart 1996; Stronza 2005; Vivaco 2001). Others, while providing cash income for local people through the commodification of nature and culture, change social practices in troubling ways (Leatherman and Goodman 2005).

Several anthropologists have examined the relationship between ecotourism development, environmental conservation, development organizations, and local people (Stonich 2005; Wallace and Diamante 2005). James G. Carrier and Donald V. L. Macleod (2005) argue that even with the well-meaning rhetoric sold by ecotourism companies, ecotourists themselves are usually ignorant about the socioenvironmental context of their trips. In Montego Bay Marine Park, Jamaica, and Del Este National Park, Dominican Republic, ecotourism is a fetishized commodity that obscures the ecological and sociological realities that make it possible. Carrier and Macleod show that the growth of national parks is directly connected to the increasing market for ecotourism and that this nexus of ecodevelopment has directly deprived people of their lands and livelihoods. Others have also shown this link between markets for tourism and markets for protected areas (Chapin 1990) and suggested that successful ecotourism enterprises often lead to pushes for mass tourism (Weinberg, Bellows, and Ekster 2002).

This is not to say that ecotourism is always bad—rather that site-specific strategies should be developed (Schelhas et al. 2002). Indeed, if local people are involved in enterprises from the beginning and can receive the majority of their benefits, they can be successful (Scheyvens 1999). There are some conditions that present the possibility of some local people's benefiting from ecotourism (Weinberg, Bellows, and Ekster 2002). In Meso-America the degree to which people have control over their common-pool resources and land tenure affects ecotourism outcomes (Moreno 2005). In the Philippines and Belize whale shark tourism has resulted in a thriving commercial sector, but the benefits are not distributed equally within communities (Quiros 2005). Indeed, even with all of the possible negative effects of ecotourism, some peoples and communities are overwhelmingly in favor of its development (Mehta and Kellert 1998). Yet, the economic benefits of ecotourism are often skewed toward nonindigenous and non-Aboriginal peoples (Dyer, Aberdeen, and Schuler 2003).[7]

Thus far I have touched on the idea of "benefits" that derive from tourism in general and ecotourism specifically. By "benefits" I mean the fulfillment of the economic promissory notes that are given to people when they are incorporated into tourism ventures carried out on their lands or reefs or in their villages. What is and is not a benefit is of course site specific and locally understood and experienced. In some places discussed in the literature the benefits are economic in nature, mostly cash income through payments for land use, direct employment, and ancillary employment through the supplying of food and handicrafts. In other locations benefits are more directly connected to the inclusion of villages and forests in regional networks of social services such as medical care, schools, and road building.

This review has highlighted several important issues for thinking about scientific tourism. First, even with the negative effects of ecotourism there is a large market for it, yet, increasingly, the idea of being a "tourist" has come to mean someone who is content with an inauthentic experience (MacCannell 1999, 94; see also Boorstin 1972). This has given rise to alternative scripts for thinking about tourism, one of which is scientific tourism. Second, this review has highlighted the commodification and essentialization of nature and culture that go along with ecotourism enterprises. This is important for discussions of scientific tourists because of the reasons given by these tourists for their travels and because of the way they represent their travels to others. It is also connected to the issue of translation. Scientific tourists often see their trips as allowing them the opportunity to become armchair experts on the places and peoples they have visited. Third, this review has highlighted the nexus of development, conservation, and ecotourism that is important in the case of science that brings some of the benefits of tourism. Local communities want the benefits associated with ecotourism, and scientific research can provide some of these benefits without some of the negative impacts we see with tourism.

In addition to this large literature on tourism, there is an equally large and much-reviewed anthropological literature on science (Franklin 1995; Martin 1998; Nader 1996; Traweek 1993). Since their emergence in the 1980s science and tech-

7. While some scholars suggest that anthropologists could be "translators" who could help ecotourism succeed (Ingles 2005), others argue that "translation" is much more complicated and that there may be ideas about the natural world that are untranslatable (West 2005). Stronza (2005) carefully discusses her experiences as a "cultural broker" between Indian groups in the Peruvian Amazon and tour providers in a "megadiversity hotspot." She worked not as a translator but as a mediator who helped contribute to the two groups' ability to communicate and to see each other's desires and needs with greater clarity. Others have advocated the incorporation of indigenous voices in interpretation, planning, and delivery of information (Carr 2004).

nology studies have produced a careful and academically successful critique of science and scientific objectivity and shown science to be a "foundational belief system" (Franklin 1995, 165). Yet in popular culture, knowledge and information presented as science are privileged discourse. Indeed, with the growth of popular science publications and television, science has never carried more social and political weight. Today science both explains the world and shows us how to understand it; science is both knowledge and practice (Moore 1993). As a public discourse science has overtaken social science and the idea of socially generated causality in the modern consciousness (Rabinow 1994, 1996). Scientific knowledge not only makes our lives and our world legible (Scott 1998) but also *makes our lives* in the Foucauldian sense (Rabinow 1996). Science shapes the very matter of our world and our ways of understanding it, and scientists are accorded a privileged place in the popular consciousness.

Today the literature on science in anthropology can be broadly grouped into the following categories: science and technology studies (see Hess 1992; Hess and Layne 1992); science, technology, feminism, and gender (see Haraway 1997); the ethnography of scientific practice in laboratories (e.g., Latour 1999; Traweek 1988); science and technology as they relate to nationalism and nations (e.g., Masco 2006); the science of citizens and selves (e.g., Abu El-Haj 2001; Fortun and Fortun 2005); the science of biotechnology and bioprospecting as they are connected to wider market forces (e.g., Hayden 2003; Rajan 2006); the science of computers and technology (Helmreich 2000); and the animal turn (Haraway 2003; Mullin 1999, 2002; Mullin and Cassidy 2007). What is of interest to me here is the literature on how and why people practice conservation-related sciences, how biologists and ecologists think, and how their thoughts and practices affect the world around them (Harper 2002; Helmreich 2005; Kirksey 2006; Lowe 2006; West 2006*a*; Bamford 2007).

Anthropologists of science have shown that facts are produced and deployed "on the ground" as if they had no history of production and were not situated in particular politics and political struggles (Abu El-Haj 2001). In what follows I will highlight several pieces from the anthropology of science literature that help us read scientific tourists in Papua New Guinea. In "Pilgrim's Progress: Male Tales Told During a Life in Physics" Sharon Traweek lays out the structure through which young men become members of the high-energy-physics community.[8] She shows how the community reproduces and renews itself by the training of novices through both formal education and informal yet highly regularized processes of incorporation, monitoring, and control. There is a series of stages though which novices must pass, with each stage having a set of learning forms, rites of passage, and inherent anxieties. Young physicists begin their journey of interpolation as undergraduate students who learn physics from textbooks and by doing mathematical problems in which they "plug data into the appropriate mathematical formulae" (p. 76). They learn how to execute experiments, but they rarely work on experimental design and are never encouraged to offer alternative interpretations of data or different modes of analysis. Their textbooks portray a chronological and logical historic order to physics, and the disciplinary history is written as a set of stories about "heroes and antiheroes" and good judgment (p. 77). The textbooks also emphasize the idea of a community in the discipline, one that polices access to its restricted borders and has rigid hierarchies. Traweek (1988, 78) analyzes the images of famous physicists in the student textbooks and shows that they portray a "cluster of subliminal messages," including the idea that science is the product of individual great men, that it is "independent of all social or political contexts," and that all knowledge (in all fields) derives from physics. This combines with an enduring fixation on the "scientist-hero," a man who leads a romantic life of physics-related brilliance, "who, with great tenacity and perception, reorders our understanding of the laws of nature" (p. 81).

The second step to community entry is graduate school. Here students are separated into the subfields of physics, which are hierarchically ordered, and begin to learn, in addition to many facts, the material and social workings of physics (Traweek 1988, 82). They begin to see these hierarchies of the physics community playing out in their day-to-day laboratory lives with labmates, advisers, and others and to order their personal lives in particular ways that allow for most of their time and energy to be spent on physics. Finally, they gradually begin to see that learning facts gets one only so far and that extraordinary acts or innovations actually lead to some measure of success.

After graduate school the physicists serve six-year postdoctoral positions that are meant to conclude their training or "apprenticeship" in the profession and the community (Traweek 1988, 85). During this period they are evaluated to determine whether they will become part of the "particle physics core community" or one of the "peripheral groups" or whether they will have to leave the field for a less prestigious field such as astrophysics, biophysics, geophysics, or computer science. This is also the stage at which they are evaluated in terms of their possible movement into prestige waged-labor positions at major labs and universities with extensive research equipment or the less desirable positions at second-tier universities. As postdoctoral researchers they are also, finally, expected to begin to find their physics not in textbooks and articles but in their communications with others in the field and to "shape their own reputations" (p. 86). It is at this stage where "independent" and "risky" work is rewarded and where self-presentation shifts from that of the graduate student to the "competitive, haughty, and superficially noncon-

8. Although I will not focus on Traweek's arguments about gender here, her work is part of a large body of literature that examines the highly gendered nature of the natural and physical sciences (see Fox 1982, 1987; Traweek 1988; Harding 1991; Haraway 1991, 1997; Martin 1999; Wilson 2002).

formist" (p. 87). Validity of work comes to be seen in light of one's aggressiveness and confidence, and during this stage they learn that position in the hierarchy is tied not only to one's work but also to the way one is viewed in the field as a social self.

The second piece that can help us read scientific tourists is Michael Lynch and John Law's (1999) "Pictures, Texts, and Objects: The Literary Language Game of Bird-Watching." This paper offers a close reading of the behaviors of contemporary bird-watchers and the textual field guides. The authors argue that bird-watching is not simply looking at birds and seeing them but a complex set of relationships between words, objects, activities, and epistemology (Lynch and Law 1999, 320). They conclude that bird-watching is not a science but rather a more accessible form of "naturalistic observation" that has historical and social ties to "more fully accredited scientific practices." On the road to this conclusion they lay out some of the boundaries between amateur pastimes such as bird-watching and the more cutting-edge debates and discoveries in the natural sciences. Their paper highlights some of the central differences between amateur scientists, such as bird-watchers, and professional scientists, such as ornithologists. Both amateurs and professionals make, manage, and maintain lists of birds seen. They all focus on the physical appearance of the birds initially and then conduct a more fine-grained analysis of what particular species they might be encountering. They link together some of the "network of categories, associations, and activities" in which they take part (p. 336). However, professional scientists extend this practice of observation further than amateurs in that they categorize the birds on the basis of behaviors, actions, and interactions with their external worlds and eventually conduct comparative morphology with the actual bodies of the birds and comparative genetics with their blood. Amateur bird-watching is open to almost anyone, while the process of becoming part of the scientific community is long-drawn-out and regularized. In addition, while focused on observation, the amateurs do not necessarily connect what they see with other sorts of practices associated with scientific study (p. 337). Another distinction between amateur practice and professional practice is the locus of the conversations in which each group is taking part. Amateur bird-watchers make and discuss lists and interact socially with each other and a larger community of "birders" through events such as holiday bird counts. Professional scientists may have these interactions (most do, in fact), but they also take part in a large set of conversations about birds and their physiology, behavioral ecology, and genetics and in conversations that take the specifics of ornithology into other academic fields: conversations about biogeography, forest systematics, and ecological processes. For amateurs, each bird is a unique individual that fits a type but has value in its singular sighting. For scientists each bird is a commensurable object/entity that has value as a representation of the species and as part of a larger system or set of systems.

The third and final paper that will guide us in our analysis of scientific tourists, "Institutional Ecology, 'Translations' and Boundary Objects: Amateurs and Professionals in Berkeley's Museum of Vertebrate Zoology, 1907–39," by Susan Leigh Star and James R. Griesemer (1989), examines science as a set of heterogeneous practices and actors that ultimately depends on cooperation. Science rests on common understandings, reliability across multiple domains, and the careful collection of information that "retains its integrity across time, space, and local contingencies." For Star and Griesemer (1989) the "central tension" in science is between the divergent viewpoints and the "need for generalizable findings." In their examination of the development of the Berkeley Museum of Vertebrate Zoology they show the multiple social worlds (for example, "professional scientists, amateur naturalists, patrons, hired hands and administrators") that produce parts of scientific work and how members of these worlds and their work translate and are translated for each other (p. 388). They argue that translation and cooperation among diverse participants are among the hallmarks of scientific work.

Star and Griesemer show how difficulties arise in scientific labor when the different worlds of the actors intersect. It is in these intersections that communication and translation are needed so that new scientific knowledge can be built. They discuss the "reconciliation" required at these points of intersection and how scientists and others involved in the labor of science "translate, negotiate, debate, triangulate and simplify in order to work together" (Star and Griesemer 1989, 389). They use the actor-network-theory notion of *interessement* to examine this reconciliation. To create scientific authority "entrepreneurs" gather a range of participants from multiple social worlds and then "re-interpret their concerns to fit their own programmatic goals and then establish themselves as gatekeepers" (p. 398). In this process the ideas and concerns of nonscientists are translated into those of scientists and the scientific world.

In the case of the museum studied by Star and Griesemer, professional biologists, amateur naturalists, wealthy ecology-interested donors, patrons of science, amateur collectors, backwoods trappers, farmers, landowners, traders, and university administrators contributed knowledge, vision, and labor to the institution's development and the science it generated. For the scientific goals of the museum to be met with all of these social worlds intersecting, a "trick" of translation was needed, and it required "developing, teaching and enforcing a clear set of methods to 'discipline' the information obtained by collectors, trappers, and other non-scientists" and the development of "boundary objects" that would facilitate both autonomy and communication between the different social worlds (Star and Griesemer 1989, 404).[9] Star and Grie-

9. The boundary objects are actual material objects such as "specimens, field notes, museums and maps of particular territories" that are made when people from different social worlds work to represent nature (Star and Griesemer 1989, 404).

semer show how shared methods developed, communication flourished, and science originated through the social relations between these multiple worlds and their actors.

Maimafu Village, the CMWMA, and Scientific Research

The Gimi-speaking residents of Maimafu village have taken part in the CMWMA conservation-as-development project for the past 20 years (West 2006*a*).[10] The Crater Mountain integrated conservation and development project, funded by the Biodiversity Conservation Network (BCN), was, among other things, an attempt to create village-based businesses that were directly connected to biological diversity. BCN was a short-term program funded by the U.S. Agency for International Development and the World Wildlife Fund that was meant to discover the conditions that make for successful conservation projects (Salafsky et al. 2001, 1,586) by "testing" the following hypothesis: "If local communities receive sufficient benefits from an enterprise that depends on biodiversity, then they will act to counter internal and external threats to that biodiversity" (BSP 1996, 1). The BCN-funded projects, 39 in all, were thus premised on the idea that conservation is not likely to succeed if it is not tied to the "economic needs of local communities" (BSP 1997, iii). Therefore, each of the projects that BCN funded had at least one "ecological enterprise" as part of the integrated conservation and development project intervention (Salafsky et al. 2001, 1,586). These ecological enterprises included nontimber forest-product extraction, small-scale timber harvesting, collection of samples for pharmaceutical compounds, and construction of ecotourism lodges.[11] BCN in general and the ecological enterprises specifically are a form of the process of "econeoliberalism" (West 2006*b*). This is a processual economic strategy in which the state and state services and supports with regard to the environment and conservation recede and the market is supposed to intervene and create forms and sites of sustainable, ecologically friendly development.

At Crater Mountain ecotourism has not been the kind of success that was hoped for by project architects or Maimafu's residents. What has been a success, in terms of generating income for the rural landowners, has been the marketing of the area as a "research hot spot."[12] By this I mean the discursive production of the CMWMA as a place that is understudied scientifically, where scientists can conduct research through an already existing infrastructure provided by RCF and WCS-PNG. This discursive production is built on the rhetoric of loss; Crater Mountain is discussed in terms of its biological diversity and its uniqueness in the context of loss of diversity across the rest of the island of New Guinea. Over the course of a recent year, between July 2002 and June 2003, 21 people who identified themselves in the village guestbook as scientists passed through Maimafu. In addition to paying for lodging at the village guesthouse, these scientists paid for guides, carriers, parabiologists, cooks, food, and fees to village people for the use of their land. Since its creation, the CMWMA has become one of the most active areas for biological research in the country. There are more than 50 peer-reviewed publications based on research in the CMWMA as well as 5 Ph.D. dissertations, 5 M.S. theses, and 12 honors theses.

The population that I am calling "scientists" here is made up of people who collect and analyze various forms of data and then publish their results in academic journals and reports, government publications, nongovernmental organization publications, or conservation-related publications including Web pages, practitioner journals, and reports that are often termed "gray literature." These people generally have a research project that is described in a research proposal and is part of a larger research trajectory either for their own careers or for the institutions or organizations for which they work. Many of them are associated with universities, nongovernmental organizations, or research institutions such as museums, and, if they are foreigners, they have been granted research permits by the government of Papua New Guinea through the National Research Institute. Some people conducting research may be contracted by nongovernmental or government organizations to collect data for specific projects or government agencies. These actors have all been through processes similar to the ones that Traweek (1988) describes. Their training has been a regularized process of incorporation into a larger community of scholars, and they have worked to gain entry into both their disciplinary worlds and the world of "New Guinea research" by taking part in formal and informal events and practices such as conferences. They bring money to villages where there is no market for traditional tourism or even ecotourism (Mack and Bino 2003).

In the case of the villages whose lands make up the CMWMA, during the past 17 years 512 outsiders have visited the area and brought thousands of kina[13] to these rural places in payment for access, accommodation, and labor. These 512 people (see table 1) have visited the CMWMA for about 29,443 days and spent on average 20 kina per day, with a total income for CMWMA villages of 475,020 kina (about $164,094 at today's exchange rate).[14] These figures do not include the contributions that researchers have made to the national

10. There are three Gimi-speaking villages and two Fas/Pawaian-speaking villages, with a total of approximately 5,000 people, within the boundary of the wildlife management area.

11. Elsewhere (West 2001, 2005, 2006*a*), I have critiqued BCN as a neoliberal attempt to open rural places in Papua New Guinea to markets and examined its social effects in great detail.

12. Much of this success is due to the opening of a national office of WCS. The office helps people who have not worked in Papua New Guinea before to make connections with field sites and gather supplies, sends them out to the rural sites in which they will conduct their research, and, in general, coordinates the needs of first-time and returning researchers.

13. The kina is the official currency of Papua New Guinea.

14. I thank Andrew Mack and Robert Bino for these data.

Table 1: Category of Visitor and Number of Person Days at the CMWMA (1998–2005)

Category	Person-Days	No. of Visits
Conservation professional	1,060	39
Journalist	50	7
Photographer	74	8
Research assistant	6,315	83
Researcher	17,000	180
Student trainee	4,379	162
Tourist	126	15
Trainer	439	18

economy through the purchase of international airline tickets and hotel stays in Port Moresby and Goroka while in transit and to the regional economy though the purchase of trade-store goods and in-country airline tickets. For example, an ecologist (personal communication) working in the country states,

> For a four-month project in forests near [name of village], an estimated $4,600 (kina 13,285) was spent in local communities to cover field assistant wages, carrier fees, ground use fees, and purchase of local food stuffs. An additional $5,680 (kina 16,651) was spent in country to cover domestic travel and purchase supplies.

Tourists are notoriously "faddish in their tastes" (Crick 1989, 315), and this means that no small or alternative market is guaranteed for the long term. Tourists may tire of seeing rural villages and biological diversity in Papua New Guinea, but as long as the biological diversity stays seemingly intact but under threat, scientists will continue to visit the country. Although it is economically risky to focus on one strategy for economic development, it seems that, around Crater Mountain at least, the one sustainable form of development and positive economic input is scientific research.

Andrew Mack and Robert Bino (2003, 3) estimate that scientific researchers at Crater Mountain alone have brought more than kina 800,000 in foreign revenue into Papua New Guinea and that their ecological impact has been negligible:

> Unlike the forestry, fishery or mining industries; research tourism causes no loss in natural resources. None of PNG's assets are taken from our shores and sold to generate this foreign revenue. Usually the only things that research tourists leave PNG with are notebooks filled with observations and numbers in them. Occasionally a very few specimens are taken as vouchers. These collections have no impact on PNG's flora and fauna; they are not sold, they document and verify the scientist's observations and are deposited in herbaria and museums for educational purposes. In most countries sale of scientific specimens is, in fact, illegal and there is no market for them.

Some ecologists advocated the use of science as an economic development strategy in the early 1990s (Hartshorn 1995), but there is little discussion of this in either the tourism literature or the literature that advocates econeoliberal solutions to the problems of conservation and development. Within the econeoliberal program that was the BCN, given the rhetoric of loss that surrounds Papua New Guinea's biological diversity, and with the emergence of the CMWMA as a research hot spot where scientific research has flourished, a new social form for Papua New Guinea emerged: scientific tourism.

Tourism as Pilot Study: Seeking an Authentic Self and Other

On a quiet afternoon in 1998 Nara and I were sitting with a group of men discussing development in Maimafu. There had just been a community meeting regarding a gold mining exploration site located on the northern border of the village (see West 2006*b*), and one man, Ikikausa, argued that while mining would bring services, such as schools and hospitals, it would also bring sexually transmitted diseases. In opposition to Ikikausa, another man, Nimi, agreed that this was a possibility but said that, as a community of older, wiser men, they could teach the young men about these health risks. Nimi went on to argue that since there were tangible offers in terms of building and staffing schools and hospitals from the mining company, the community should choose the development options offered. His commentary assessed the failures of the national government in terms of providing services to rural areas, and he questioned the wisdom of continuing to wait for a government that seemed to keep most of the national budget in urban areas. As the conversation progressed, our first scientific tourist approached us and joined in.

The European man in his mid-20s was visiting Papua New Guinea in general and the CMWMA specifically to try to "come up with a project" that he would then "write up in an application" for Ph.D. programs. He had studied ecology as an undergraduate and after taking several years off from his schooling planned to return to the university to continue his studies. He had chosen Papua New Guinea as a site for his potential research because he had an uncle who lived in the country and he had spent many of his formative years listening to stories about its nature and culture. As he approached us, he asked in English, "What are you talking about?" Nara, a man who understands cultural subtext, said to him in English, "We have many choices to make about development here. What do you think are our best options in terms of long-term and short-term development?" After the question was translated into Unavisa Gimi, the group of men waited quietly for the answer. Though I feared making the situation artificial, I asked whether I could turn on my

tape recorder. The tourist, after thinking for a few minutes, said, in slow, simple Pidgin,[15]

> Now, development, it cannot come about in your village if you do not do some basic things. You must learn about hygiene. That is the most important thing. You must be very sanitary so you will not get sick. You must teach your wives to wash their hands before they cook your meals. You must teach your children to wipe themselves with tissue after they go to the outhouse. That is how disease gets spread. Sanitation is the key to development. Now, second, you must listen to the good talk from the Research and Conservation Foundation. They are men who know what to do. They will teach you about the importance of your bush. They will show you that your forest is valuable and that you do not want to cut it down. They will teach you about the problems with burning the forest. They are good men who have plenty of knowledge to give you.

With this, the crowd of men, all of whom spoke Pidgin fluently, began to smile and shake their heads at him. Nara then said something in Unavisa Gimi that, at the time, I did not understand. I found out later, by translating the tape with the help of my other assistants, that Nara was openly mocking the man.

This incident became a villagewide joke. In numerous conversations about the incident men told me that they not only had been offended but also thought that the European visitor might be stupid. They thought that he had not understood the question and that because of this he had fallen back into rhetoric that they had all heard as children. They all seemed to understand that Nara had asked the question in English because he realized that the visitor might not get the complexity of it if it was asked in Pidgin, as he did not speak Pidgin very well. In addition, most of the men pointed out that the man was apparently not worried about their being offended by his speaking English, because he had initially spoken to me in English. People also, for the most part, found his inability to see the complexity of the choices that they must make about development to be a sign that most outsiders really did not understand the village issues when it came to development. Nara said,

> Now do you see what we have to put up with? Every white man who comes here wants to teach us to wash our hands. I want to figure out how to get a scholarship to the university in Port Moresby, but this idiot thinks that I need to know basic personal hygiene. Can you see how frustrating that is?

After the aforementioned development conversation, the scientific tourist and his female partner came to my house for tea. The woman, also in her mid-20s, had studied biochemistry at the university and afterward taken a few years off to pursue other interests and get "out of the lab." During our talk they asked me whether the residents of Maimafu had thoughts and conversations about religion, meaning, and the relationship between experience and consciousness (what I took to mean phenomenology). They both wanted to understand why Maimafu's residents seemed so different from "us" and to try to come to terms with what they saw as a "primitive" lifestyle and a "primitive psyche." One of them said, "They just seem so basic, so content to work in the garden and go to the bush" and "They don't have the cares and worries that we do."

A few days after our talk, the scientific tourists began testing some of the equipment they had brought with them for data collection. The equipment involved a complicated series of mechanical parts, and their testing of it brought about 150 people out to watch. The onlookers were concerned with the possible detrimental effects the equipment might have upon the residents of Maimafu. Would it blow up and kill everyone watching? Would it alter the physical zone where the knowable atmosphere meets the unreachable atmosphere where planes and birds fly? Old men and women wondered whether it would alter or impede the movements of *auna* or *kore* ("spirits" or "ghosts"; Gillison 1993; West 2005). Later that night, inspired by this last question, there was a long debate in one of the cooking houses regarding the presence of *kore* in a Christian imaginary.[16] Were *kore* the same as devils? If *auna* means "soul" and is the part of you that is forgiven when you accept Jesus, then how could *kore* (the form that *auna* takes upon your death) be the same as devils?

When I told the scientific tourists about this conversation the next day, they grew excited. This seemed to prove to them, in a way that my assurances could not, that Gimi people do indeed have rich intellectual lives and complex understandings of phenomenology. They were very happy to have generated the conversation concerning *auna*, *kore*, and Christianity but were worried that their equipment had frightened people—so much so, in fact, that they held a villagewide meeting later in the week to discuss their research and to answer any questions that people had for them.

Adventure Tourism as Science

Four schoolmates from a midsized British university arrived

15. Melanesian Pidgin seems at first to be quite easy to learn, and indeed, the basics of the language are fairly simple. It is, however, a very difficult language to learn to speak fluently. As a Creole language it is constantly changing, and it takes profoundly different forms in different parts of the country. Indeed, the Pidgin spoken in Port Moresby is often difficult, at first, for village Pidgin-speakers to understand, and village Pidgin is often mocked by urban speakers for its slowness and simplicity. Many expatriates in the country never learn to speak Melanesian Pidgin fluently. They learn enough to get by with their household employees and in town shops. Most short-term European visitors learn a similar sort of simple Pidgin.

16. Older Gimi still hold many beliefs associated with *kore* and *auna* (see Gillison 1993 especially), while many younger Gimi are devout Seventh Day Adventists (see West 2006*a*).

in Maimafu in 2004. The bright young woman who seemed to be the spokesperson for the group had communicated with me through e-mail before they arrived. In the e-mails she had told me that they were coming to Papua New Guinea to "study" biological diversity in coffee gardens and that their proposed research was focused on the following question: Are birds more attracted to organic coffee plots owned and managed by individual families, organic plantations owned by local landholders and managed by a small coffee export company, or nonorganic plantations owned and operated by a large company? They hoped, she said, that their "research" would contribute to a growing understanding of the possible benefits of organic agriculture for wildlife. Their travel funding came from their university through a program that funds undergraduate research experiences and from their parents, who, the young woman told me, had all been happy that their children were to take part in a trip that would be both an adventure and a research-based learning experience.

The young woman and her companions, three young men, did a bit of what could be considered research while they were in Papua New Guinea. They conducted bird flyover counts (an ornithological science and amateur bird-watching method in which one sits in or on the edge of a garden and counts the number and type, if identifiable, of birds that fly over during a given period, working under the assumption that the birds are utilizing the landscapes around where one is sitting) while visiting three of the types of coffee gardens (plantation-type gardens and small, locally owned and locally managed organic plots in Maimafu village).

While in Maimafu, the four college students played rugby on the village airstrip with young men from the small hamlets that make up the wider village; took long walks in the dense and beautiful tropical forests surrounding the village; went on village-organized sightseeing trips to view displaying Raggiana birds of paradise, a magnificent, perfectly round lake high in the mountains near Maimafu, and a cave with an impressively large number of bats; and conducted the aforementioned flyover counts. They also planned what they were going to do during the rest of their trip, deciding between diving near Madang, climbing Mt. Wilhelm, hiking the Kokoda Trail, and taking an organized boat trip down the Sepik River—all interesting locations and activities that make up a large portion of the country's tourist attractions. After leaving Maimafu none of these students ever wrote anything public about the place or the people or contacted anyone with the CMWMA again.

Tourism as Entrepreneurial Science

In 2002 Isabelle and Jean-François Lagrot, veterinarians and self-described "travelers," visited Maimafu to conduct "scientific research" and look for tree kangaroos (Lagrot 2003, 46). They published the "results" of their visit in the March–April 2003 issue of *Asian Geographic* magazine. In the publication they discuss their fascination with tree kangaroos because the animals are "unknown to science," their research sponsorship by the firm Merial, "a French-American vet lab," and their success in finding three tree kangaroos in a two-week period (p. 48). They also discuss a number of "magic words" that the "Papuan hunters" they worked with had for animals (p. 48). Two of these "magic words" were *kama* and *kapul*, words that are not magic at all—given that Gimi do not have a notion that any language is "magic" or that individual utterances have the power to change relations between humans and the spirit world. The words simply mean "Doria's tree kangaroo" in Gimi and "tree kangaroo" in Melanesian Pidgin, respectively. They describe Maimafu as a village "lost in the mountains" (p. 48).

The Lagrots told WCS's directors that they were trained as veterinarians but that they were not in the country to work with the animals in any medically related way. Both nongovernmental organizations talked to the Lagrots about Maimafu and tree kangaroos, and WCS scientists, having conducted biological surveys throughout the Crater Mountain area, showed them where they thought that they might have the best chance of seeing tree kangaroos in such a short period of time. The staff members of WCS-PNG told me that they had warned the Lagrots that when dogs were used to hunt tree kangaroos, the dogs always either killed or injured the animals.

J.-F. Lagrot says in his paper that they were much more successful in finding tree kangaroos than the American biologists who had been working around Maimafu for the past several years. He explains that the Americans had had little success because they had failed to work with "Papuan hunters" who used dogs but that he and his wife had spent "a lot of time training the hunters and explaining exactly what [the dogs] were there for" (Lagrot 2003, 48).[17] Gimi men who accompanied the Lagrots say that once a dog is of hunting age, he or she is as trained as can be—that you cannot teach an old dog new practices.

There are several other inconsistencies between Lagrot's portrayal of his and his wife's trip to Maimafu and their work with its residents and local men's recollections of their visit. One of the men who took them to the summit of Crater Mountain, where they say they captured, photographed, filmed, took blood and hair samples from, and then released several tree kangaroos, tells a very different story. Marcus says that from the beginning of the visit, people in Maimafu were concerned that the Lagrots may face risk, created by asking local people to guide them to an area that would be dangerous for outsiders like them. The couple had brought their four-year-old daughter with them to Maimafu, and although they

17. It cannot be stressed strongly enough here that dogs in Maimafu and elsewhere in Papua New Guinea are bred and trained to hunt tree kangaroos. Once a dog catches a scent, it is impossible to call him or her off of it.

mention her in their publication, they do not mention that people initially refused to take her to the top of Crater Mountain. Marcus said, "It is not a walk or a place for a child. It is difficult and dangerous, especially for whites who are not good in the bush. We did not want to take her, but they told us that we had to do it." Lagrot (2003, 49) says that Marcus, "the team leader," would not let anyone else carry the child. Marcus told me that no one else would take the responsibility of carrying her. At the time Marcus was desperate for cash, and he persuaded all the other men from Maimafu to accompany him on the trek. Lagrot states that the trekking party located the Doria's tree kangaroos on the top of Crater Mountain because they did not want to interfere with the American team's research site. Marcus contends that while they did climb Crater Mountain, they found the tree kangaroos directly in the center of the WCS 1998 survey site. The animals the Lagrots found were indeed mauled by the dogs. Marcus told me that after the Lagrots went to sleep, the hunters easily tracked the injured animals and killed and ate them. He argued that their actions were much more humane than letting the animals die in the forest "for no good reason."

Reading Gimi Ideas of Others

While anthropologists have examined the social and economic effects of tourism, they have not adequately examined why and how particular local people become involved in tourism ventures or local opinions about tourists (Stronza 2001, 266; see also Cohen 1984, 381). Malcolm Crick (1989, 330) argued that "we need to know how people in other cultures perceive and understand tourists as a species of foreigner, what motivations they attribute to their behavior, and how they distinguish among types of tourist." The residents of Maimafu are quite candid in their assessments of tourists and scientists, and I became interested in scientific tourism because of their opinions of the visitors described above. These visitors destabilize the categories that people from Maimafu use to make sense of the strangers who visit their village. By "strangers" I mean nonlocal visitors who are not related to anyone in Maimafu and who are not passing through Maimafu on the way to neighboring villages. People in Maimafu make distinctions regarding visitors by classifying them as government workers or officials, tourists, scientists or researchers, missionaries, coffee buyers, and gold miners.

People from Maimafu have seen many researchers come through their village and forests. Their first experience with scientists was in 1997 during a biological training course that was conducted in their forests. During this course, they worked with the researchers, serving as guides, porters, and cooks and helping with data collection (through mist netting, trapping, and plant collection). They subsequently worked with numerous other researchers and research groups. In general, people in Maimafu do not understand what outsiders mean when they talk about "conservation," but they do understand "research." They know that it entails all the aforementioned labor and that the goal is to collect information that is both readily observable, from specimens and forest processes, and not readily observable, such that specimens must be taken away. They associate research and researchers with cash income and the opportunity to build new social relations that might cement into exchange relationships over time. Many of the researchers (not scientific tourists) who visit Maimafu come back year after year. During these visits Maimafu's residents attempt to incorporate these scientists into social relations of exchange by giving them food, labor, and gifts. They see reciprocity in some of the transactions that transpire. For example, a biologist might give a man a towel as a gift upon leaving the village. That man might see the towel as gift given in return for the friendship, support, and food he gave the biologist during his stay in the village. The man might then expect that the next time the biologist comes to Maimafu, they will continue this relationship with further exchanges.

When the people that they consider tourists come to their village, the residents of Maimafu spend time with them walking in the forests and from one small village hamlet to another (Maimafu is made up of numerous individual hamlets on high ridgetops) and answering questions about the environment and social life. They also cook and carry things for them. They see this work as strikingly similar to the labor they do for scientists, but they make a distinction because most tourists try to "teach" them something. One of my friends, a man of about 35 who speaks fluent Melanesian Pidgin and nearly fluent English, says, "The tourists always want to talk to me about sick-AIDS, how lucky we are to have a big forest, how we need to send our children to school, and things like that." There is a general feeling that these conversations are rather condescending. The visitors I describe above complicate the set of designations for my friends in Maimafu. They blur the line between tourist and researcher for them—and for me.

Residents of Maimafu also see tourists as refusing to take part in any form of social relation of exchange because more often than not when residents approach a tourist with a gift, the tourist readily accepts it and never reciprocates. These gifts are usually garden-grown food, and the tourists appear to appreciate them. They often praise the quality of the produce, engage the giver in conversation about horticultural practices, and discuss the lack of fresh produce in their home countries. The giver then waits and waits for some sort of return gift and does not receive it. He or she then goes away, discusses things with his or her family, and returns several times while the tourist is there, hoping for a gift. If, in frustration, the person from Maimafu hints at what he or she might like in exchange, the tourist often becomes angry and begins to lecture about how village-based tourism will work

only if residents do not bother tourists with requests for things such as flashlights, shoes, and T-shirts.

Reading Scientific Tourists' Ideas of Self and Other

All tourists wish to gain symbolic and cultural capital from their trips (Bourdieu 1986; see also Munt 1994*a*, 1994*b*), a kind of socially recognized legitimation of themselves as "worldly" and "well traveled" (symbolic capital) and a bit of knowledge about the places they go (cultural capital; Bourdieu 1986, 245). In some cases, tourists may also work to convert these forms of capital into economically productive forms (into economic capital; Bourdieu 1986, 253). Scientific tourism is based on a market for seemingly out-of-the-way places and less-than-developed peoples that are easily accessible to nonscientists. It is also based upon the idea that the places to be toured are "unknown to science," "remote," and perhaps even on the edge of change. It is a form of ecotourism because within it the environment and society are turned into things to be consumed by and rendered legible to outsiders; thus, they become easy for tourists to fit within existing notions of what nature and culture are or should be, and they are easily turned into symbolic and cultural capital.

In a world where "sophisticated tourists like to laugh at inferior versions of themselves" (Crick 1989, 309), thinking of tourism as a form of scientific practice and discussing it that way alleviates guilt and sets the tourist outside of what is increasingly seen as a suspect class of people and set of actions. This can also be seen with "volunteer tourism" (Wearing 2001). Here I want to distinguish the "scientific tourism" described in this paper from other forms of alternative tourism that are connected to scientific practice. The Earthwatch Institute and Operation Wallacea are examples of organizations that mix scientific research and tourism in ways that differ from what has been described in this paper. These organizations bring volunteers to remote locations to help scientists who have existing research projects collect data. They work in both the biological and the social sciences with the goal of contributing to the conservation of biological diversity. They differ from what I am describing because the volunteers collect data that contribute to the building of scientific knowledge. For example, in a rural farming community in western Ecuador information gathered by Earthwatch volunteers and returned to the community by Earthwatch scientists helped rural farmers change land allocation rules and patterns so that they could establish a community-owned and community-managed forest reserve (Becker and Ghimire 2003). In this case initial examinations of local knowledge and attitudes to environmental issues were obtained through volunteer-administered surveys analyzed by the scientists who directed the volunteer teams (Becker and Ghimire 2003).[18] The interactions described in this case and the effects of the research conducted by these volunteers are similar to the set of interactions discussed by Star and Griesemer (1989). Volunteers, as amateurs from social worlds different from those occupied by scientists, served as nodes in the network of science creation and important labor in the process.[19]

Scientific tourism also differs from the numerous university-sponsored and on-going research projects in archaeology that engage volunteers on archaeological digs worldwide.[20] These digs are usually long-term projects that have a solid set of empirical goals. In all of the programs that use volunteers to do the labor of science, there is a regularized set of methods and goals and a highly structured and organized research project into which the volunteers fit themselves, their labor, and the data they collect. The scientific tourists I have described are on their own with very loosely organized research goals and no larger set of conversations in which they are taking part. The scientific tourism described is not about contributing to an ongoing dialogue but rather is directly connected to self-fashioning and individual gain.

The first set of scientific tourists I have discussed, the postgraduates, came to the place looking for authenticity, primitivism, and the self-created and focused "beyond." They wanted an authentic "other" and were also looking for authentic scientific selves. Having finished their schooling earlier and taken time off while trying out other nonscientific careers, they approached Papua New Guinea with an eye to creating a set of scripts that would allow them to cast themselves as on the road to the identity of "scientist." Although the route they were pursuing was different from the regularized one discussed by Traweek (1988), there were similarities. They both planned on using their trip to gain entry into a community of scientists and to begin the road to professionalization and professional degrees. In the ecological sciences the road to professionalization is much less regularized than in physics, and this sort of postgraduate touristic experience is a valid and often-taken step toward careers in conservation ecology and biology.

The young man went on to spend another year in Papua New Guinea working with a development project in a very remote Western Highlands region. He went to the far edge of government services and what he assumed to be the far edge of mission services. He was truly looking for the authentic primitive, one who had not been corrupted by Western ways. The young woman went on to spend a year at a remote research station. She was on a quest for authentic nature, and the station, in a patch of forest that had been uninhabited and ostensibly unhunted for 20 years, offered that. While there she found a sort of nonhuman nature that she desired. These

18. This paper appears online only and can be found at http://www.consecol.org/vol8/iss1/art1/.

19. There is, however, an emerging critique of using volunteers as researchers and amateur scholars in some settings. See http://www.alertnet.org/db/blogs/40453/2007/07/15-170930-1.htm.

20. See http://www.archaeolink.com/archaeology_volunteer_opportunit.htm.

two scientific tourists wanted the pristine and untouched, and they wanted to experience these things as intrepid scientific explorers. Both of them expressed worry about the loss of authenticity around Crater Mountain and connected this to "development." They both saw unfettered tourism as a possible additional detriment to the nature and culture they longed for. In this vein neither of them would have taken part in mainstream tourism, but alternative tourism in the form of ecotouristic scientific tourism was perfect for them. It allowed for travel, self-seeking, and prestige building, and it alleviated some of their guilt over their own perceived role, or that of their country, in the global threats to biodiversity and cultural diversity.

The "work" done by these two scientific tourists, unlike the amateurs discussed in the papers above (Lynch and Law 1999; Star and Griesemer 1989), did not contribute in any way to the development of the science of and for the Crater Mountain area, nor did it contribute to any set of scientific conversations or debates or help to build knowledge in any way. Conversely, some of the work done by the British university students did contribute to a set of conversations about biological and cultural diversity in the areas surrounding Crater Mountain. Their bird flyover counts were taken as pilot data for a larger study of the uses of coffee gardens by fauna (West n.d.).[21] Even with this contribution, their experience still fit more readily with ecotourism and adventure tourism. They wanted to get "off the beaten path" and to follow in the footsteps of the great men of science from their ecology and biology textbooks (Traweek 1988). They also wanted to have fun and experience parts of the world that were not similar to their home or the places that their fellow university students visited during "gap year" travels. They were drawn to Papua New Guinea because of visions of spectacular nature, and they had been swayed by the rhetorics of loss that they had been exposed to in their university classrooms. They all talked passionately about the plight of biological diversity and their desire to see robust conservation in the tropics.

In many ways, in contrast to the European university postgraduates, who wanted an authentic cultural experience as well as an authentic natural experience, the British students wanted a "fun" cultural experience. They wanted social play, in the senses of both rugby, ultimate Frisbee, and hiking to beautiful places and meeting interesting and strange people from out-of-the-way places so that they could return home and tell stories of cross-cultural connections in unusual places. Each of these students, in slightly different language, expressed to me the joy he or she felt over having "connected" with people in Maimafu who seemed so "different" but who were really "like us in lots of ways."[22] These scientific tourists sought wonder, a connection to their images of intrepid explorers from the past, high levels of biological diversity that could serve as interesting places to hike and play, and a set of experiences that would help them fashion selves through a form of tourism that seemed less damaging than traditional tourism.

If we read the experiences and desires of our first two sets of scientific tourists through Traweek's (1988) analysis of novices becoming scientists, we begin to see the self-fashioning goals of the tourists more clearly. Both the university students and the postgraduate couple were touring not only Papua New Guinea but also *science*. In ecology and conservation biology the structure through which one can become a scientist is much less rigid than in physics. This is not to say that there are not university courses, graduate courses, and postdoctoral positions that must be undertaken, but many people come to these stages in relatively unconventional ways. They may have studied the humanities as undergraduates and then traveled to some far-flung site after graduation and become fascinated by ecology and biological diversity. Or, like the university students discussed above, they may have taken a trip that was loosely based on research and found that they liked both the acts of science and the travel involved in "doing" science in a place like Papua New Guinea.

The third set of scientific tourists, the Lagrots, came to Papua New Guinea seeking a beyond that they could cast as "unknown-to-science," "magic," "lost," and "remote" (Lagrot 2003). Their portrayal of their visit to Crater Mountain casts the residents of Maimafu as exotic and savage and themselves as intrepid scientists going to the ends of the earth to collect data that will save endangered species. This is precisely what they do for all of their trips.[23] The Lagrots are scientific entrepreneurs in that they have taken the prestige associated with their status as trained scientists and turned it into an unusual career. They travel the world and publish their exploits in popular journals and magazines. They have been through the sort of regularized programs and processes that are necessary for becoming veterinarians (Traweek 1988), and yet their research does not fit any set of conversations within the science or contribute to any ongoing debate (Star and Griesemer 1989). They cast themselves almost as celebrity scientists traveling the world seeking out the unique and the singular.[24]

21. I and the company Coffee Connections used these data in a joint examination of the ecological benefits of organic smallholder coffee production.

22. I conducted several interviews with these students during their stay in Maimafu and corresponded with two of them for about two years after their visit.

23. See their Web page at http://www.odysseesauvage.com/.

24. Their only English-language book, *On the Trail of Unusual Animals in Danger of Extinction*, is described in a promotional blurb as follows: Jean-François [Lagrot] and Isabelle Prouteau are young veterinarians who went crazy for motorcycles when they realized how uniquely well suited two wheels are to penetrating and exploring the more remote corners of the globe. Their passion is looking for animals that have become so rare that everyone believes they no longer exist. Criss-crossing the world on their Yamaha dual-sports, a camera always at the ready, we join them on the trail of the Java rhinoceros, the red ibis, the babirussa, the okapi, the Tasmanian devil, the tree kangaroo and other engaging species who share an equally uncertain future. Through sheer patience and dedication, these

One of the major differences between the scientific tourists discussed and the scientists who visit Crater Mountain is the focus on the singular versus the commensurable. In his discussion of how "commoditization homogenizes value," Igor Kopytoff (1986, 73–75) draws a conceptual distinction between objects that are seen as singular and resist commoditization and things that are seen as common and can easily be commoditized. For scientists the natural world as biological diversity is split into millions of species, organisms, and processes. Yet each species, organism, and process is a type, not a singular entity. For example, for population ecologists each Doria's tree kangaroo is an example of the species, and what is important is understanding the organism as part of a species, not as a singular entity. All Doria's tree kangaroos are commensurable; one is the same as all the others. For the Lagrots each animal is singular and salable in their discursive production of Crater Mountain as remote, fantastic, magical, and unique.

Just as there is a "yearning for singularization" in commodity-focused societies when it comes to objects (Kopytoff 1986, 80), there is a similar yearning on the part of scientific tourists. They wish to see the biological diversity that makes up the natural world as unique and special and then cast it as having been seen only by them. The value in the things seen and experienced lies in the individual experiences, while for natural scientists, when they are in "science mode," the value is in the careful cataloging of one experience within a field of similar experiences in order to produce a sort of knowledge about the entity being seen (tree kangaroo or possum or slime mold).

Conclusion

I have described a group of scientific tourists and distinguished them from scientists who bring some of the benefits usually associated with tourism. I have shown that scientific tourists destabilize both academic typologies of tourism and Gimi typologies of visitors and that scientists who bring the benefits associated with tourism destabilize academic conceptualizations of ecotourism. Scientific tourists may be young people who wish to have an educational adventure that they can turn into symbolic capital—good stories about their trip to tell when they get home, stories that accrue to them a particular self-image and a particular projected image of worldly and intrepid. They may be young adults wishing to find their way into the more regularized world of becoming scientists or adults who fancy themselves "travelers" and turn their trips into economic capital through publications in glossy magazines.

With ethnographic examples that show people on both sides of the tourism encounter, this paper has begun to fill a gap in the anthropology of tourism literature (Stronza 2005, 272). It is not simply that tourism affects local people—although it most certainly does—but that local people have opinions and ideas about tourists, what their presence means locally, and the ways they affect things locally. It is also the case that tourism affects tourists. One of the earliest studies of contemporary tourism argued that the topic could serve as a window into modernity and modern society (MacCannell 1999). Modernity's tourists, for MacCannell, are alienated individuals who face day-to-day lives of fragmentation, superficiality, and a lack of authenticity. Tourism is meant to give them experiences that make up for these social deficits. Today the multiple and various critiques of mass tourism, in both the academic and the popular press, give well-educated travelers pause.[25] They still wish to find authenticity "elsewhere" (MacCannell 1999, 378), but they are careful to indicate that they understand that mass tourism is not an authentic experience. Erik Cohen (1984, 378) argued that the modern tourist is "caught in a staged 'tourist space' from which there is no exit" and that "modern mass tourists are denied access to the back regions of the host society where genuine authenticity can be found and are presented instead with 'false backs.'" By the early 2000s modern well-educated tourists knew this and sought that authenticity through alternative forms of tourism (Stronza 2001, 274; Wearing 2001). Today these same tourists understand that alternative tourism claims may simply mask the staged and inauthentic nature of mass tourism and therefore attempt to augment the experience of elsewhere with a set of science-based rhetorics to justify their travel. They are not simply "tourists" but "conducting research." They are undertaking tourism that has "an earnest science-emulating cast" (Stasch 2006). They are looking for both the physical "beyond," that authentic other—both other nature and other culture—that is the creation of their own fantasy and desire (Crapanzano 2003, 15), and they are looking for a sort of self "beyond." They seek an identity that seems more progressive and right-thinking than that of a simple tourist. They are attempting to construct self-images that include elements of "intrepid," "scientific," and "explorer." In its self-image-making, this form of tourism is very similar to what Stephen Wearing (2001; Wearing et al. 2005) has called "volunteer tourism."

The interactions people have during what has been called the "touristic experience" usually affect they way they come to conceptualize themselves and others (Wearing and Wearing 2001). Part of what guides scientific tourists and scientists in Papua New Guinea is a desire to create a particular kind of narrative of self (West 2006*a*, 162–67). Fredrick Errington and Deborah Gewertz (2004, 3–4) have argued that narratives are crucial aspects of social life and self-fashioning that "organize desire and compel action" by giving people images of what can be attained and desired and that they "anchor people

incredible motorcycle adventurers are able to photograph these exotic animals and tell us their stories."

25. A Lexis-Nexis search for articles on the negative effects of tourism on July 13, 2007, turned up 1,000 articles in major U.S. and world publications.

in their pasts, situate them in their presents, and—of even more importance—project them into their futures." People's narratives of self are intimately tied to their imaginings of other: both "natural" other and "cultural" other. Both scientific tourism and science are motivated, in part, by this seeking of self, and they both contribute to people's creation of self-narratives. These narratives are as closely connected to the imagination as they are to the real experiences that people have in Papua New Guinea.

When scientific tourists represent their travels as scientific in nature, they are using the language of science to negate the tourism aspect of their travels. All of the scientific tourists that I have mentioned and all of the others that I have encountered during my work in Papua New Guinea are highly educated, well-off Westerners. There is a sort of shame associated with traditional tourism and even ecotourism in some elite, well-educated social networks (see Bryant and Goodman 2004). Because of this the people I describe in this paper attempt to make sense of their desire for other places and other peoples through the language of science, a language that can justify the trip to Papua New Guinea because of the particular place that it has in the Western scientific imagination. Both environmental conservation and social justice become "representational practices" for these alternative consumers (Bryant and Goodman 2004). The rhetorics of conservation and justice are used to justify consumption practices by people from the North in the face of tropical deforestation and devastation in the South (Bryant and Goodman 2004).

It is never the case that tourists are the first outsiders to visit out-of-the-way places (Smith 1977, 52–53). Indeed, in much of New Guinea there is usually a long list of previous visitors that includes traders, early naturalists, explorers, colonists, colonial administrators, missionaries, and anthropologists (Kirsch 2006; West 2006*a*). The experiences of scientific tourists in Maimafu and those they desired are connected to the intertwinings of commerce, imagination, and science. It is also not the case that these modern tourists are the first travelers to feel ambivalence and guilt about their travel (Crick 1989, 307).

For both scientific tourists and scientists New Guinea sits at the nexus of the exotic, the pristine, the about-to-be-lost natural and cultural, the primitive, the untouched, and the spectacular. Coupled with the global rhetoric of loss that surrounds biological diversity, these images make New Guinea a powerful space for imaginary and representational practice.

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Comments

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Tourism is a phenomenon in search of salvation or, at the very least, redemption (Campbell, Gray, and Meletis 2008). West describes another in a growing list of alternative tourisms—science tourism, in which tourists seek to distinguish themselves from the mainstream by engaging in informal scientific activity. The road to science tourism is well paved; volunteer ecotourists also engage in science, and we see many similarities between these two groups. For example, local people distinguish volunteer ecotourists from regular tourists mostly on the basis of their intentions (Campbell, Haalboom, and Trow 2007; Gray and Campbell 2007), while volunteer ecotourists emphasize their contributions to science and conservation (Campbell and Smith 2005, 2006). Like West's science tourists, volunteer ecotourists participate in part to further their professional aspirations (Campbell and Smith 2005), and many have concerns about and opinions on local development (Gray and Campbell 2007).

In what ways, then, do science tourists and volunteer ecotourists differ? In West's analysis, the distinction lies in contributions to science. Volunteer ecotourists "collect data that contribute to the building of scientific knowledge," while science tourists rarely produce recognizable scientific outputs. West is interested in the use of science in identity making and the way this use reflects the social power of science; for meaning and distinction, alliance with the authority of science is an attractive option for tourists wanting to make more of their activities. West questions the veracity of this alliance, and although we agree with her argument on many levels, we find an interesting tension in the paper. Her critique is informed by the social studies of science, but her own views of science appear somewhat contrary to it. We see this tension most clearly in her treatment of boundaries.

Boundary work, or how scientists and institutions patrol and defend the realm of what counts as science, is a central theme in social studies of science (Gieryn 1995; Nader 1996). Most boundary work in social studies of science is constructivist, where boundaries are treated as products of a process: "what science 'is' at a given time and place results from complex negotiations among scientists and those allies whose allegiances they would enroll, or who would enroll them" (Takacs 1996, 114). In describing how science tourists distinguish themselves from other tourists, West is constructivist (Gieryn 1995). She also observes how residents of Maimafu construct boundaries between science tourists and scientists on the basis

of nonscientific factors. Scientists do not tell local people what to do, while science tourists condescendingly try to educate them. Scientists engage in proper exchange relations with local people, whereas science tourists fail to grasp exchange expectations.

But herein lies the tension: West also engages in essentialist boundary work (Gieryn 1995). It is West, not any of her informants, who uses scientific practice to distinguish between science tourists and scientists. Scientists write proposals and publish in peer-reviewed journals, whereas scientific tourists do not. In addition, scientists bring economic benefits and have low impacts; West is silent on economic impacts of science tourists and describes negative impacts in other areas. Overall, scientists are the standard to which science tourists are compared and found wanting, but scientists themselves are not scrutinized.

We find West's treatment of scientists surprising for three reasons. First, when contrasted with other scientists interested in biodiversity conservation (e.g., Campbell 2000, 2002), scientists working in the Crater Mountain Wildlife Management Area appear exceptional in their low impacts, neutrality on development, and cultural sensitivity.[1] Second, according to existing definitions of tourism (United Nations 1994), scientists count as tourists, and West's interests in how tourists use science to make tourism more meaningful should extend to them. Furthermore, West recognizes that the processes by which conservation biologists and ecologists are incorporated into their disciplines are often informal. The science tourists who are also students are attempting to enter this process, as her "real" scientists likely did at some point. Thus, there may be a continuum at work here rather than a dichotomy between tourist science and "real" science. Third, West's critique of science tourists relies on their "false" claims to science, but this critique becomes blurred with that of their social-economic impacts. Does imagining, experiencing, and portraying by science tourists and the impacts of this for local communities warrant scrutiny only when claims to science are questionable? Would the offending practices of science tourists be interpreted differently if their research was published or academically sound? We suspect that West will answer these questions with a resounding "no," given her in-depth exploration of the practices of scientists in other work (West 2006*a*). Nonetheless, these questions arise in the current paper.

Though Nader (1996, 8) claims that anthropologists have issued "a challenge to the use of science with a capital S as a means of asserting absolute positional authority," West's critique of science tourists for their (mis)use of science ultimately reinforces the "capital S" authority of "real" scientists. Authority is extended beyond science itself into the realm of impact; scientists are also better tourists. While West's analysis of how science is implicated in the creation of self and other for science tourists is compelling, we question the extent to which this process is distinct from those happening in volunteer ecotourism or for "real" scientists.

1. We may be misreading West on this point, as it is sometimes difficult to discern whose vision of scientists is being described. For example, in the story of a scientist leaving a towel with a community member, it is not clear whether it is West or the local people (or both) who believe this reflects the scientist's understanding of "proper exchange relations."

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West invites us to consider the antics of some visitors to the Crater Mountain Wildlife Management Area (CMWMA) in order to elaborate on the concept of scientific tourism proposed by Laarman and Perdue (1989). The people in question are 8 out of the 512 "outsiders" who have reportedly visited the CMWMA over the past 17 years but are not to be confused with the 425 researchers, research assistants, and student researchers who visited the area to engage in the practice of "real science" rather than scientific tourism. We are not told what the other 79 outsiders were doing in the area, except that one of them was the 4-year-old child of a couple of the scientific tourists. Therefore it is unclear whether these are the only scientific tourists—or, indeed, the only tourists of any kind—to have visited this area in 17 years or whether they should be regarded as a sample of the larger category of scientific tourists whom West claims to have encountered in her travels to Papua New Guinea.

Are these eight people sufficiently alike in their actions or motivations—or even in the eyes the Maimafu villagers who studied them—to qualify as a distinct species of the genus "tourist"? Four of them, it seems, were British university undergraduates who said that they were studying biological diversity in local coffee gardens, so one may wonder why they did not qualify as student researchers. Their failure to publish scientific papers would hardly count them out, so we are instead informed that they could not have been practicing real science because they wanted to "have fun." But there are surely some real scientists—even some anthropologists—who manage to have fun while doing fieldwork in Papua New Guinea and even visit a tourist destination before leaving the country.

Then we have the pair of French veterinarians who went hunting for tree kangaroos and wrote an account of their adventure in *Asian Geographic* magazine. These people are surely travel writers of the kind whose work appears in every issue of *Paradise*, the in-flight magazine of Air Niugini. This particular couple might better be described as "eccentric" than as "scientific tourists" because the former label provides a more accurate account of the relationship between their work and that of a "real" scientific adventurer such as Tim Flannery (1998).

Finally, we have the second European couple, who came to Papua New Guinea to hunt for possible Ph.D. research topics in the field of ecology. They do not sound like fun-lovers, and instead of funding the cost of their trip with a magazine article, after their visit to the CMWMA, they explored even more remote parts of the country to wash away the sins of Western civilization. I would call these people "escapists," but that is a label that I would also apply to many of the anthropologists who have chosen to undertake their fieldwork in the remote corners of Papua New Guinea—including myself at the tender age when I first went there.

Of course, we anthropologists are real scientists, and the people of Maimafu village know a real scientist when they see one, partly because they have seen so many. But how do they recognize a scientific tourist? The simple answer would be that the tourist pretends to be part of the scientific game but gives it away by breaking the rules. West offers us another answer: tourists are people who give the villagers silly advice and fail to hand over their belongings in return for gifts of food. I wonder whether all eight of the people described in the paper are equally guilty on both counts, but more important, I wonder whether the 425 visiting researchers are all equally *innocent.* In my experience, the exchange of food for silly advice is one of the most common transactions between rural villagers and visiting strangers in Papua New Guinea, and tourists are not by any means the most common sources of silly advice (see, e.g., the aid industry).

The scientific tourists also stand accused of a third offense (unless, perhaps, it is a mitigating factor), for they are said to "destabilize both academic typologies of tourism and Gimi typologies of visitors." Surely, the point of the article is to show that scientific tourists are different from other types of tourists, not only in the form of their self-consciousness but also in the way that Gimi people see them; they are just another product of the universal urge to classify strangers. My question is whether the point has in fact been demonstrated by the analysis of these eight individual members of the hypothetical species.

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West's paper is both creative and ambitious. It links two fields that have rarely been connected: the anthropology of tourism and the anthropology of science. This articulation is grounded in an ethnographic discussion of what West calls "scientific tourists" in Papua New Guinea. By "scientific tourists," she means travelers who employ some of the idioms, practices, and tools of science. She not only reviews these two literatures but also attempts to explore the relationship among science, commerce, the imagination, and representational practices.

West makes the valuable point that Westerners' engagements with Papua New Guinea are greatly influenced by a broad range of cultural productions, such as films, popular literature, tourism packages, and scientific studies. Some of these narratives are fairly specific to Papua New Guinea; others are part of dominant Western understandings, such as the "savage slot" that goes back centuries (Trouillot 1991). As an interested reader, I wish that West had elaborated further on how perceptions of Papua New Guinea as a place of primitive peoples and wild nature might borrow and differ from these more generic Western understandings. When West did delve into the specifics of how visitors talked about people and place and how Gimi categorized, felt about, and discussed such tourists, the results were rich and illuminating.

In a similar light, West's insights into Papua New Guinea's environments were most interesting when grounded in the particular. This could be enhanced by more historical examination and ethnographic detail. Some exemplary work on the role of particular places in the environmental imagination includes studies by Feeley-Harnik (1995) and Sodikoff (2005), who trace the ways in which colonial legacies in Madagascar continue to shape conservationists' visions and plans. West's work could show how discourses about Papua New Guinea are created by both Westerners and people in Papua New Guinea, in part through scientific tourism.

As much as West's subject matter and approach are insightful, she draws a firm line between scientific tourists and scientists proper that may preclude certain possibilities. Such a division might unintentionally reify science as an object with rigid and clear borders. As she mentions, sometimes scientific tourists become scientists proper and tourists' work becomes part of a larger scientific discourse. Alternatively, several scholars, such as David Hess (1993), regard science not as a thing possessed by professional scientists but as a kind of social resource. According to Gieryn (1983), science does not have absolute borders; what counts as science in a given time and place is accomplished by "boundary work" undertaken by a wide range of individuals. Using this approach, we can follow efforts to gain scientific authority in multiple contexts. In contrast, Latour (1999) almost exclusively focuses on the worlds of professional scientists. I suggest that a boundary work approach can mitigate against such a division between scientific and nonscientific and allow us to examine a broad range of people engaged in creating and shaping discourses. If the stark distinction between scientific tourists and scientists proper is dropped, then we can also examine the social lives of the latter.

Such an analytic broadening would contribute to social studies of science, which examine mostly laboratory rather than field scientists. Environmental anthropology also benefits from studies of how ecologists actually produce scientific knowledge. Helmreich's (2005) examination of biologists in Hawaii remains one of the best ethnographic studies of field scientists and the intensely social, political, and power-laden process of making biological knowledge. Scholarship by Raf-

fles (2002, chap. 6), Latour (1999, chap. 2), Lowe (2006), and Constantino (2007) explores the social dynamics of field science; each of these scholars shows the complex processes of boundary work that inform collaborations as well as struggles and bring into view these dense networks, including scientific papers, scientists, field laborers, tools, and objects of study. West's research is well placed to reveal how scientists' notions of and relationships with local people and nature in Papua New Guinea affect the framing of research questions, the pragmatics of fieldwork, and the kinds of conclusions, policies, and projects that are linked to their studies.

In the field of nature conservation, as West reminds us, boundary work is quite extensive. It draws on multiple forms of knowledge, persuasion, image, and narrative. As she shows, this realm is inhabited not solely by ecologists and biologists but also by tourists, journalists, and many others whose identities and activities have begun to blur earlier boundaries. I believe that bringing scientific tourists and scientists proper onto the same analytic footing would produce many valuable new insights. This article is exciting in that it can reveal more broadly the actual social relationships involved in producing discourses of nature. I look forward to West's further considerations as well as work by other scholars who are stimulated by these questions.

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West's paper raises interesting questions about boundary making and scientific knowledge production. She might have found it helpful to make reference to the work of Nowotny, Scott, and Gibbons (2001) on contemporary science practices. The conservation and development project she studies is based on novel relations between science and society, which Nowotny, Scott, and Gibbons (2001) call "Mode 2 knowledge production." They use the term "Mode 1 science" to refer to disciplinary knowledge production that follows relatively homogeneous processes. Participation is restricted and hierarchical, corresponding to more traditional practices of science such as laboratory procedures. Mode 1 knowledge production assumes that science and society are separate domains. In contrast, Mode 2 knowledge production is dispersed across different kinds of institutions and includes nontraditional participants. It is more heterogeneous, reflexive, and socially accountable. An example is the way that debates about global warming extend outside the realm of climatologists. Nowotny, Scott, and Gibbons (2001) argue that Mode 2 knowledge production yields more socially robust forms of science.

The shift from Mode 1 to Mode 2 knowledge production facilitated the emergence of concepts such as biodiversity, which infuses biology with a conservation ethic (Wilson 1992), and sustainability, which combines economic interests with environmental concerns (Brundtland 1987). Because Mode 2 knowledge production connects science with social values, it generates new ambiguities and uncertainties. The emergence of "audit culture" and concerns about accountability respond in part to the anxieties produced by these new forms of science (Strathern 2000).

I find it puzzling that West's paper, which describes a Mode 2 project, seeks to reinscribe Mode 1 differences between scientists and nonscientists. West provides one example of why the category of scientific tourism might be problematic: the college student who used counts of birds flying over coffee gardens as a rough measure of biodiversity provided West with pilot data she later used in her own research, demonstrating how data and methods can move from outside to inside science. A second example of why a sharp distinction between science and nonscience may not be helpful concerns the relationships between the project biologists and Gimi-speaking people living in Maimafu. It would have been helpful to have more ethnographic information from Crater Mountain of the type presented by Star and Griesemer (1989), whose essay West discusses. In my own study of a conservation and development project similar to the one described by West (Kirsch 1996), the project ornithologist spent every evening deeply engaged in conversation with knowledgeable local men about the birds and other animals in the area. Although there are differences between the discipline of ornithology and what has been called ethnoscience, local knowledge, or traditional ecological knowledge, it is important to note that the origins of scientific knowledge in local knowledge have historically been obscured by gatekeeping strategies comparable to those proposed by West, which enhance the authority of science at the expense of people located outside of its boundaries.

There are important stakes in these questions for anthropologists. To restrict the definition of science to formal processes of knowledge production in contrast to other forms of engagement with the world might make anthropologists ideal subjects for institutional review board research protocols (also forms of "audit culture") but would omit the "deep hanging out" that most anthropologists would recognize as essential to the way they produce knowledge. West's introduction of the gatekeeping concept of scientific tourism at a historical moment when more pluralist notions of science predominate may reflect the dual anxieties of her research project in relation to the questions, vis-à-vis the biologists, of what kind of science anthropology is and, vis-à-vis the steady stream of visitors to Maimafu, whether there is a difference between anthropologists and travelers. The latter question has been a long-standing preoccupation of Melanesianists, from Malinowski's (1922) invocation of science in defining the project of ethnography to Errington and Gewertz's (1989) emphasis on politics in their classic essay on tourism in Papua New Guinea.

West's attention to the different species of ecotourists (adventure tourists, science tourists, volunteer tourists, etc.) and their distinctive patterns of behavior resembles the way biological scientists classify their data. However, her interpretive

work translating Gimi ontologies and their critique of the discourse of development has stronger affinities with the humanities. The relationship between boundary work (who counts as a scientist) and knowledge production is worth exploring further, but this example suggests that the different kinds of people one may encounter in Maimafu (college students, evolutionary biologists, conservationists, con men, anthropologists, and the Gimi themselves) may occupy more than one of the roles to which West wishes to consign them.

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West's call for a more sophisticated analysis of the motivations behind scientific tourists searching for "out-of-the-way" places and "authentic" cultures is a welcome and thought-provoking contribution to the current discussions on images, representations, and discourses related to "exotic" environments and "exotic" societies. Her insightful ethnographic analysis of the essentialist discourses, imaginings, and cross-cultural self-fashionings present in scientific tourists' encounters with the "other" is both academically and sociopolitically interesting and relevant. Her observations that, in popular culture, knowledge presented as science easily becomes a privileged discourse and that scientific tourists use science-based rhetoric to define their travels to faraway places as more justified than those of the "simple tourist" are inspiring and challenging.

In recent years, a rich body of literature has been published on tourists' views of exotic destinations and on the discourses and representations promulgated by scientific travelers in their accounts of the global South, especially in literature history, art history, anthropology, geography, and communication studies. Many of these investigations have provided inspiring analyses of the travelers' historical trajectories concerning the images of foreign environments and cultures as sometimes infernal and sometimes paradisal (e.g., Lutz and Collins 1993; Nugent 1993; Nygren 2006; Miller and Reill 1996; Raffles 2002; Ramos 1998; Slater 1996, 2002; Stepan 2001; Torgovnick 1990). A better consideration of this literature could have perhaps enriched West's analysis, especially concerning the heterogeneity of the images and discourses divulgated by such travelers. In fact, I was somewhat surprised by how monolithically the European scientific tourists exploring Maimafu are presented in West's analysis as travelers looking for the "pristine" and "untouched." Although such kinds of scientific tourists do exist, I wonder whether at least some of them would have been able to reflect more profoundly on their position as privileged European voyagers in southern peripheries. A better explanation of how the informants were selected and how representative they were of the scientific tourists traveling in Papua New Guinea would have been highly welcome.

One of the deficiencies in social studies of conservation-related sciences is that they often do not sufficiently distinguish among conservation scientists, environmental policy makers, and conservation-minded activists. In fact, many of the examples cited in the criticism of conservation scientists refer instead to conservation advocates or conservation policy makers. In this respect, I wonder how widely conservation scientists still present ideas of "pristine" nature and "untouched" environments, as suggested by West. Considering the recent advances in the ecological theories of nonequilibrium processes, chaotic fluctuations, and spatial-temporal discontinuities within ecosystems, certain doubts can be raised. More probably, it is the conservation-minded activists who still construct such kinds of images.

It is also important to note that the narratives published by scientific tourists in popular magazines and practitioner journals represent a genre of literature in which facts and fictions mix together in a complex way (see, e.g., Duncan and Gregory 1999; Holland and Huggan 1998; Risse 1998). Furthermore, the selection of the images and representations disseminated through such magazines is often a result of negotiation and compromise among various stakeholders and their personal and institutional ambitions. Therefore, the accounts of their explorations that scientific tourists publish in popular journals cannot be evaluated with the same criteria of accuracy and objectivity as their academic publications.

I would have highly appreciated it if West had also somehow reflected more on her own position as a research scholar in Maimafu. The point of view from which a highly experienced professor of anthropology examines the naïveté of undergraduate students "looking for authenticity" is not completely fair. I wonder how many of us, as young anthropologists carrying out our first projects in which the "other" was encountered, have constructed the same kinds of stereotypes of the environments and cultures under exploration. It would therefore have been important also to consider the role of social scientists as scientific tourists. Can we blame only the ecologists for stereotypical categorizations, or would some social scientists also construct the same kinds of dichotomies? When analyzing scientific travelers' images of tropical forests and tropical forest dwellers shown in *National Geographic*, I could not find evidence that the ecologists' images had been more categorical than those of the anthropologists (Nygren 2006).

West's challenging analysis of the motivations behind scientific tourism and the narratives of "self" and "other" constructed by scientific tourists provides significant new insight concerning the study of images and representations related to tourism. Her article will certainly attract much attention among different scholars within many disciplines. As stated by West herself, this subject warrants further analysis and should be explored in greater detail in diverse contexts. I completely agree with her on the importance of the critical

analysis of the relationship among science, travel, the imagination, and representational practices.

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West's is an engaging paper. Drawing on an ethnography of science and tourism at Crater Mountain, Papua New Guinea, West advances the compelling overall point that despite the claims of scientific tourism programs to foster a deep-seated desire to learn, discover, be part of the host environment, and strive for environmental conservation and social justice, such claims do not appear to be free from the rhetoric and practices embedded in more traditional tourism forms. Put somewhat differently, the rhetoric of scientific tourism (i.e., desire to learn, discover, be part of the host environment, strive for environmental conservation and social justice) are simply another means for Western tourists to justify their travels, experiences, and consumption practices. Accordingly, West takes as her overall point that the claims of scientific tourism may simply mask the staged and inauthentic nature of tourism and in so doing exclude the voices, concerns, and needs of toured populations. These findings in and of themselves have been made in other contexts but are certainly worth making again. However, what West does specifically is focus on the relationship among tourism, science, commerce, the imagination, and representational practices; this approach is quite interesting and offers a convincing analysis that contributes to the tourism literature. In the spirit of contributing to this discussion and with West's compelling overall arguments in mind, I would like to offer a few points for discussion.

According to West, the rhetoric of scientific tourism plays on the derogatory connotations long connected to mass tourism. Among others, mass tourism and the mass tourist have been associated both directly and indirectly with environmental degradation, sociocultural disturbance, and homogenization. Scientific tourism, therefore, becomes a new tool to fight against environmental degradation, sociocultural disturbance, and increasing sameness, or, at the very least, its rhetoric positions it as such. By insisting that it provides scientific tourists with a meaningful set of experiences and increased global and local awareness, scientific tourism positions itself as a sustainable, less damaging form of tourism. However, in an age when tourists increasingly refuse to see themselves as tourists or for that matter as engaging in "mass practices," we must take notice of the significant continuity in the nature of tourist practices and experiences. Indeed, decades of studying and examining tourists' consumer behavior have made increasingly clear the significant overlap in tourist motivations, practices, and experiences. Therefore, it should be no surprise that the same tourist who longs to visit Crater Mountain and visit plantation-style gardens and small locally owned and locally managed organic plots will also play rugby, take long walks in the surrounding tropical forests, take part in village-organized sightseeing trips, visit the local caves, hike a trail, dive, and take an organized boat trip. We must, however, question our assumptions that the same tourist who seeks to learn, discover, and be part of the host environment cannot possibly be the same tourist who also seeks to take part in organized sightseeing trips, buy mass-produced trinkets, and get drunk. In particular, West's work has implications for understanding tourist motivation, practices, and experiences more generally. This could be achieved by linking the current literature review of why people engage in scientific tourism to the literature discussing larger forces driving tourism as a general phenomenon. The same tensions that West recognizes in the context of scientific tourism between those who argue that the modern world is alienating and inauthentic and, as such, tourists seek to escape this meaningless, inauthentic existence also exist for tourism more generally. By exploring the motivation of, practices of, and constraints on tourists who are active participants in the construction of their own travel experiences in line with their own travel agendas, one is positioned to make a significant contribution to tourism literature more generally. Tourists are increasingly sophisticated and resourceful when it comes to meeting their needs and preferences; possibly, the label one attaches to the form of tourism reveals more about social discourse and moral legitimacy than about the practices and experience themselves. This argument is not without problems, but at least it makes us attuned to these processes.

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I will reflect here on just two of West's essay's many accomplishments: West's documentation of the existence of scientific tourism as a distinctive genre of travel activity and her account of this activity's value to those engaged in it.

Notably, the paper's accomplishments all emerge through a methodological practice pursued by other important works in the anthropology of tourism (e.g., Causey 2003). West juxtaposes tourists' models of their activities with touristically visited people's quite different, highly sophisticated understandings of tourists and the touristic encounter. This is a main basis on which West succeeds in vividly characterizing and relativizing what scientific tourists are doing, culturally speaking.

In opening the question of scientific tourism's appeal to its practitioners, West's study raises issues of the cultural status of science as valuable, prestigious, or virtuous. West suggests that tourists' parascientific self-fashionings might work to overwrite potentially negative definitions of tourism as such.

Here she quotes Crick (1989) on the common empirical finding that tourists traveling in specific styles competitively evaluate their activities relationally to the touristic activities of others. Traveling outside their home sociocultural worlds, tourists carry stratificational baggage: projects and anxieties of knowing their own positional social and moral worth. They live these out more vividly during tourism than at other times, in part through intense reflexive efforts of evaluating the morality of their own touristic activity. *Tristes Tropiques* is an anthropological locus classicus of both the diagnosis and the performance of this structure, according to which any given type of travel is defined relationally by its position on a stratificational treadmill of other travelers' actions.

Alongside the suggestion that scientific tourists seek to inhabit science's value in order to foreclose "touristic shame" (Frow 1991, 146–49) and achieve distinction in a stratified array of possible tourism acts, West also presents more specific thoughts on what I would term the ritual dimensions of scientific tourism's value: ways in which tourists create concrete experiences of practical action that, to them, seamlessly and convincingly incarnate powerful, virtuous macrocosmic visions of world order and their places in it. This is the aesthetic quality that Bruner and Kirshenblatt-Gimblett (1994) may have meant by "tourist realism": an apparently immediate and thus experientially powerful and pleasurable integration between, on the one hand, small particulars of a concrete sensory and interactional here and now and, on the other hand, big cosmo-historical myths. For example, different visitors to Maimafu are oriented in part toward variations on a myth of first contact between an intrepid scientific consciousness and an unknown, lost, or disappearing object.

All three cases, though, raise a possibility that science might be functioning in scientific tourism not only to valorize tourists' own activities in relation to the actions of other *tourists* but also to transform or gloss over troubling alternative interactional frames in relation to *visited* people, including frames of equality—or even inferiority, incomprehension, and nonbelonging—in relation to Maimafu villagers and their landscape.

Having retraced a few of West's points about the appeal of scientific tourism, I want to close with minor remarks about her identification of this tourism as a distinctive type of activity in the first place. A striking theme in West's paper is Maimafu villagers' own generalizations about different types of visitors, such as the notion that researchers enter into social relations of exchange with locals while tourists refuse to do so. On these and other grounds spelled out by West, it is clear that scientific tourists exist. Yet if science and scientific tourism are distinct, they are also mutually related. Some scientific tourists become scientists, many scientists write and publish works that motivate and structure other people's practices of scientific tourism (e.g., Flannery 1998), and there are at least occasional cases of travel by contemporary undergraduate science students that fall in a border zone where science and scientific tourism more ambiguously overlap than exemplified by the case materials in this paper. The current small boom in self-structured scientific tourism as a genre of travel probably owes an enormous amount to scientific or parascientific TV programming and print journalism. But it is likely that the boom is also partly derivative of the earlier historical rise of formal study tours promoted and staffed by museums and universities, two core institutional bases of science proper (Morse 1997). Scientists themselves, including anthropologists, have been consequential proponents of the great elegiac narrative of loss and possible contact with a disappearing object that forms a major motivating cosmological background to scientific tourists' own activities. Researchers and scientific tourists act differently, but they are probably participants in a single system, in ways that West's excellent paper puts us in a position to start describing.

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With this insightful article, West has pulled the curtain on yet another backstage area of tourism. The behind-the-scenes play she describes includes actors who are seldom discussed in social analyses of tourism—"scientific tourists," who are similar to scientists but carry much of the same baggage as tourists. As tourism is travel for leisure and science a search for knowledge, then "scientific tourism" is something like a leisurely pursuit of knowledge or a knowledgeable pursuit of leisure. Either way, it is not especially serious, but it is also not trivial.

As West notes, tourism companies and researchers have become allies in the quest to create experiences that feel and act like tourism with a conscience. Conservation biologists in particular have started partnering with tour companies to draw visitors who will pay to work on research projects ("conservation holidays") and thus contribute both labor and capital to scientific endeavors. This brand of tourism emerges in tandem with increased calls for citizen involvement in science and environmental monitoring.

West's analysis is most compelling when she relates both sides of the encounters between scientific tourists and villagers of Maimafu in Papua New Guinea. Her stories reminded me of the hapless tourists in O'Rourke's 1998 film *Cannibal Tours* who travel from village to village along the Sepik River in Papua New Guinea, philosophizing with equal parts nostalgia and pity about the lives of the local people they meet. The film has become a classic among anthropologists because it captures so vividly the ways in which tourists and locals see each other through distorted cultural filters. As people peer into each other's lives, either through the lens of a camera or behind the mask of a cultural costume, they reveal a world about themselves.

What West brings to this discussion is a fascinating portrayal of how scientists too reveal so much about themselves and their imaginations of the world through their fieldwork. While in elite, well-educated circles, tourism might evoke feelings of shame, scientific fieldwork, however rudimentary, still carries with it a certain prestige and romance. It is funny to consider how the term "scientific tourism" could at once flatter tourists and send ripples of indignation to scientists. Consider that if a research trip is at all "touristy," the authenticity of the field scientist is questioned. Imagine the humor in this for those of us who actually study tourism *in* tourism lodges.

Yet, by focusing primarily on those who emulate science, I wonder whether West is a little too easy on the bona fide scientists—or those she characterizes as people who engage with broader scientific conversations and debates. At least here I am thinking about myself. The study site I know best in the Peruvian Amazon is especially popular among both researchers and tourists. It is a "research hotspot," to use West's term, in part because it is also a "biodiversity hotspot." One community in the region, a titled native territory of 150 families dispersed over 10,000 ha, receives 6,000–7,000 ecotourists every year, along with handfuls of new researchers. Since the early 1990s, the community has become a veritable hub of field schools, undergraduate honors projects, doctoral investigations, and conservation-as-development projects. Villagers with primary school education have come to know the names of major universities in the United States and Europe, and they understand what an "adviser" is and what it means to "defend a thesis." Several people boast a surprisingly big portfolio of acting appearances as "natives" in documentary films about the Amazon. In a world of scientific tourists, we are also seeing a trend toward "celebrity primitives."

Researchers in the area, myself included, tend to characterize our fieldwork as adventurous, arduous, exciting, and important. I appreciate West's insight that field research can represent a process of building one's self as much as it can seeking knowledge. I know that my own research has become a marker of who I am and a plotline I tend to invoke in narratives of my life. Just as tourists keep scrapbooks and souvenirs from their adventures, scientists too display photographs of themselves in the field (thatched hut backdrops), arrows on the wall, and monkey skulls on the bookshelves.

On a last point, West notes that locals often equate scientists and tourists because both offer cash income and opportunities to build new social relations. While this is certainly true, I would also suggest that scientists can be both more intrusive and less supportive than tourists in material ways. By staying in communities and homes with people and probing their lives with observations and questions, through our research we may develop more meaningful social relations but perhaps at a cost we seldom fully acknowledge. By offering to "help" or "teach" in return for our investigations, we may be unwittingly demanding more than tourists who stay out of the way (in lodges) and pay set fees for services. In this way, field research may seem like "more than tourism" especially for the dilettante scientist but "less than tourism" for the locals.

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As someone who has encountered many practitioners of scientific tourism in Madagascar over the past decade, I am very grateful to West for the careful and critical way in which she approaches this understudied social form. To date, my own (less sophisticated) take on scientific tourism has been that it offers something very attractive to those who undertake it: the thrill of discovery without the drudgery of paperwork. Not only do scientific tourists often lack the degrees, vetted proposals, research visas, and ethics reviews that are essential to most research projects undertaken with the intention of contributing to mainstream scientific debate, but also they need not worry too much about either what is already known of the topics in which they are interested or what contribution their own findings stand to make. A long soak in the culture of science, however shallowly they might wade, is enough to set scientific tourists off on quests for the unknown and unstudied. That the discoveries they seek and sometimes claim to find are destined to be deemed insignificant by the larger scientific community is unimportant in the end. As West makes clear, no matter how scientific tourists' travels and efforts are framed, the quests on which they embark tend to be personal quests of self-discovery more than anything else.

Continuing with an argument begun previously in this publication (West and Carrier 2004), West highlights the significance of "authenticity" to the new forms of tourism that have emerged in recent decades alongside rising dissatisfaction among some with the traditional authenticity-seeking behaviors of *The Tourist* (MacCannell 1999). Unwilling to abide the inauthenticity and destructive consumerism that seem to characterize most modern touristic encounters, scientific and other alternative tourists explore what they take to be the last frontiers of authenticity in two ways: first, by heading off the beaten path to people and places that not just anybody has the fortitude (or money) to reach and, second, by approaching these people and places not as hedonistic consumers but as students and envoys, with as much to teach as they have to learn. As West points out, however, it bears keeping in mind that scientific tourists are likely to come across quite differently in the stories told about them by the people they encounter in out-of-the-way places than they do in those they tell to and about themselves. It is also clear from the cases that West presents that the authenticity sought through much scientific tourism is of a particular, generic, sort. However much these people might appear to be interested in the singular, it is not difficult to imagine them coming to many of the same experiences and discoveries in any number of other,

ultimately commensurable, out-of-the-way places. It is revealing, for example, that what brought the European postgraduate to Crater Mountain had more to do with his family history than with anything inherent to the place; presumably, he could have just as effectively gone out of the way in other directions in search of a suitable topic for his Ph.D. research. Similarly, the work of the French veterinarians reveals as much about the nature-magazine-reading public's taste for generic authenticity as it does about the endangered species they pursue; as West notes, the Lagrots are "entrepreneurs" who serially capitalize on what they must market as singular, meaning that the totemic place of this year's tree kangaroos is destined to be taken over by next year's rhinos, gorillas, or aye-ayes.

Although West hints at the ludic side of scientific tourism, I wonder whether there is not more to be said about how this social form and scientific research more generally might be understood as akin to play. What is common to the various sorts of "social play" that the British undergraduates participated in during their stay in Maimafu—rugby, hiking to beautiful places, and meeting interesting people, for example—is that they are all at once nonessential and yet important to the development of the individuals who undertake them. Is it too much to argue that the "work" of these individuals and, by extension, that of the others West describes is similarly playful? Among other things, scientific tourism seems to offer its practitioners precisely what play does: opportunities to mime the roles of those they admire, to make and learn from mistakes without great concern for the consequences, and, ultimately, to engage (however fleetingly) as key players in worlds of their own invention. For many of the observers I have met in out-of-the-way places in Madagascar over the years (see Walsh 2005, 2007), it is certainly quite evident that the foreigners who pass through communities on quests of one sort or another (anthropologists included) are "playing" at something, engaging in activities that are obviously more prospective than productive.

Reply

Within anthropology, we are lucky to have rich analyses of both science and tourism as ideology and practice. My paper asks what happens when science and tourism coalesce and suggests that this integration produces a new social form that may be of interest to those who analyze science and those who analyze tourism. The commentaries provided are thoughtful, thought provoking, and helpful, and I thank the people who contributed them. They force me to think more carefully about several issues and urge me to clarify some points that may have been misunderstood.

Santos, Nygren, and Hathaway suggest that the paper would have benefited from the consideration of literatures that I did not cover. Santos thought the paper would benefit from a richer contextualization within the literature that considers the "larger forces driving tourism as a general phenomenon." This is an important point and one that I will certainly consider in future work. In order to understand how Papua New Guinea is similar to other global sites of touristic consumption and how its scientific tourists are similar to other tourist consumers, the sort of close reading of the wider political economy of tourism literature that Santos recommends is crucial. I locate scientific tourism within a wider range of practices that fall under the political-economic umbrella of econeoliberalism, a set of policies and practices that allow and sometimes compel nonstate actors to take on important conservation and development and conservation-as-development roles at multiple scales.

Conservation as development is an approach to conservation ecology and economic development in which it is assumed that environmental conservation can be economic development for rural peoples; that development needs, wants, and desires can be met by the protection of biodiversity on their lands; and that if they take part in small-scale income-generation projects that are directly connected to this biodiversity, they can seamlessly enter global markets as producers and consumers while at the same time working to conserve biodiversity for the supposed good of the entire planet. These policies and practices are meant to both conserve the natural world and provide cash income so that people living where state services have retreated can pay for basic needs such as education, health care, and subsistence. The projects also move the management and legislation of the relations among people, their surroundings, and the market into the purview of nongovernmental organizations, private industry, and other nonstate institutions. These econeoliberal practices and policies attempt to meet the social and economic needs of rural peoples through fostering, facilitating, and supporting the retreat of the state and putting private industry and nongovernmental organizations in their places.

Nygren suggests that I should have paid more attention to the literature analyzing historic and contemporary travelers' accounts written by tourists and scientists and argues that if I had done so, I would have better addressed the "heterogeneity of the images and discourses divulgated by such travelers." This assumes heterogeneity in the images and discourses that I have encountered in the 11 years I have worked at Crater Mountain. Nygren states surprise with "how monolithically" I present the views of Maimafu's interlocutors as looking for pristine and untouched nature and culture. I have also been surprised and shocked by the monolithic responses to interviews, surveys, and informal conversations concerned with external perceptions of nature and culture and the assumed relationship between the two. The vast majority of people who visit Maimafu—be they scientific tourists, tourists, conservation ecologists, environmental activists, conservation practitioners, government agents, missionaries, or development practitioners—arrive with a set of assumptions

about the sorts of pristine nature and culture they will find there and the impending doom that will be wrought by their equally monolithic image of something variously called "acculturation," "modernization," "development," and "change." This connects directly to Hathaway's suggestion that I engage with the literature that shows how Westerners are part of and produce a particular set of images of primitive peoples and wild nature that are the generic "savage slot" to which many peoples living in out-of-the-way places are discursively and ideologically assigned. What is striking about images and imaginaries of Papua New Guinea is that they are always the most savage of the savage slot. Papua New Guinea is savage slotted by tourists and academics, including many anthropologists (Lederman 1998).

Nygren also wonders whether some of the scientific tourists I have encountered have been able to "reflect more profoundly on their position as privileged European voyagers in southern peripheries." The answer to this is no. Other visitors to Papua New Guinea whom I have encountered have been more self-aware insofar as they have talked about how their way of life in the North (or West, depending on one's perspective) may be contributing to the "change" and "acculturation" that they envision and lament, but neither the scientific tourists nor the general tourists whom I have encountered at Crater Mountain have been particularly insightful or introspective in these terms. These sorts of self-focused assessments can be found among aid workers, missionaries, volunteer tourists, and both scientific and nonscientific researchers.

Walsh and Stasch ask me to consider issues that I do not address in the essay. Walsh raises the issues of play and the mimetic urge. He suggests that this urge might be fulfilled when tourists emulate science and participate on its margins and that by miming the roles of people they admire, the subjects of this paper can engage the world in a "prospective" sense. Scientific tourists can play at being scientists but never have to endure the "drudgery of paperwork"; they can take "a long soak in the culture of science" without ever having to produce anything more than stories for their friends and families. Walsh's point about production is important. The people I am writing about do not ever have to produce anything based on their consumption. This is the exact opposite of what the people I call "scientists" are asked to do by both society and their peer groups. Scientists, like tourists, consume sites and others during their travel, and as Stronza reminds me in her commentary, they (we) also self-fashion through this consumption. As we consume, we are constantly thinking about production. What paper will we write based on our work? How will the data being collected fit into our next book? Can what we are observing at this site be used to shed light on something we or a colleague saw at another site? Does what we are observing give credence to a particular conceptual argument that is in fashion in our discipline, or does it contradict it, and, given either, can we write about this in ways that will work to build the discipline?

Stasch reminds me that during touristic forays, tourists experience anxieties about their "own positional social and moral worth" more vividly than they might at home and that this intense morality work is a key part of their self-fashioning. He suggests that one reason they may grasp science as a social form that can order their experiences is because of the position that it holds in a sort of modern moral cosmology in which science, as a moral and noble form, can locate them in a particular world order in a seemingly moral slot. What is interesting to me about this and about Stasch's comments in general is his proposition that there is a powerful "macrocosmic" vision of the world at play in tourism and in how people of all sorts experience each other. This focus on the cosmologies of the tourists shifts our anthropological notion that sees Gimi as having cosmologies and tourists as having ideologies. For me this allows for a sort of moral epistemology within anthropology that I find appealing. By treating tourists' ideas, beliefs, and actions as epistemologies tied to certain cosmologies, Stasch evens the field of analysis and proposes an extremely ethical way of thinking about how we examine sites of interaction between radically different sorts of people without casting one group in a cosmological savage slot and the other as a harbinger of modernity.

Nygren and Filer raise questions about the representativeness of my sample. Nygren wonders how my scientific tourist informants or subjects were selected and how well they represent the larger pool of scientific tourists traveling in Papua New Guinea. Filer wonders whether the eight people I discuss in the paper are "sufficiently alike" to warrant their inclusion as a "distinct species of the genus 'tourist.'" He also wonders about the category-based breakdown of the other outsiders visiting Maimafu in which I might engage. He argues that in lumping and splitting categories based on some actions and motivations and not others, I might well be creating false categories that hide more than they reveal. He also wonders whether the argument that there is a social form and category of scientific tourist that is distinct from either scientist or tourist has been demonstrated by the analysis of the eight individuals I write about in the paper. I would answer Filer with a resounding "no." I do not think that my analysis is sufficient to demonstrate that, but my point is to begin a thread of research and analysis that might allow anthropologists working in Papua New Guinea and elsewhere to better understand the moments when the powerful social mover that is tourism and the powerful social image that is science come together.

Hathaway, Santos, and Campbell and Gray are concerned about the boundary work implicit in the categories I use in the paper. Hathaway worries that the line I draw between scientists and scientific tourists might preclude certain analytic possibilities. He urges me to see all of the people I describe as engaging in a set of practices without absolute borders and suggests that this sort of "analytic broadening" would allow my work to contribute to an examination of how a range of variously situated actors contribute to science as discourse and practice. He cites numerous scholars who clearly show

that there is a sort of process of collaboration, competition, and struggle between a multiplicity of actors that brings particular sorts of science into being. I do not disagree with any of this in principle, and, indeed, there are numerous examples of this sort of network of variously situated actors that bring the science of Crater Mountain into being. But it is my contention that the people that I am calling scientific tourists do not contribute to this. The various actors that are written about in the texts that highlight "boundary work" all seem to produce something: amateur birders produce field counts, naturalists produce observations of animals in the wild, Earthwatch volunteers produce data, and so on. All of the products made through this boundary work then go on to be useful in one way or another to others engaged in the transactive exchanges that bring scientific knowledge into being. The scientific tourists I describe do not contribute to this. Hathaway is also concerned that the line I draw between science and scientific tourism disallows for the examination of "the social lives" of scientists. This is certainly not what I am suggesting. By saying that we need to examine scientific tourism as a form separate from science, I am not saying that science and scientists should not be a key focus for environmental anthropology.

Similarly, Campbell and Gray worry that the way that I separate the two categories mirrors the way that scientists "patrol and defend the realm of what counts as science." This is an interesting point, and I had not previously read my work in this way. I have two responses to this critique. First, I think that after 11 years of working on scientists as an object of study, among other things, I have come to see things using some of the categories that they use to order the world. By pointing this out, Campbell and Gray have reminded me that I need to be careful not to see the world through the eyes of some of my informants. Second, but connected, in the longer version of this paper, which had to be shortened for publication, there was a section about how Gimi categorize the people who come to Maimafu. Gimi distinguish clearly and strongly between scientists and tourists when they discuss the people who visit them. The people that this paper discusses, the scientific tourists, blur that distinction for Gimi and for me. They do some of the things that scientists do and some of the things that tourists do. The paper is an attempt to figure out what these people are. I think I am guilty of thinking with the categories proposed by both my scientist friends and my Gimi friends, and I thank Campbell and Gray for pointing this out.

Santos reminds me that although I am categorizing the tourists using a typology that separates scientific tourists from general tourists and assuming that these groups have different "motivations, practices, and experiences," there may well be a great deal of overlap in what all sorts of tourists want to do, see, and consume. This is an excellent point that requires me to think more carefully about what "motivations, practices, and experiences" I consider unique to scientific tourists and what might be common to all sorts of visitors to Papua New Guinea.

Stronza and Campbell and Gray argue that the people I call "scientists" seem to escape my critical gaze. I have written about scientists and their social production of self, other, space, place, nature, and culture in other places and felt that here I wanted to attempt to move beyond my previous critiques of field-based conservation scientific practice, activism, and discourse (West 2001, 2005). There is a vast literature emerging within anthropology that critiques field-based conservation science (for an extensive review of this literature, see West, Brockington, and Igoe 2006; West and Brockington 2006). This literature has yielded important insights about how power works in places that seem like margins, how social lives are turned upside down when seemingly out-of-the-way places are drawn into and produced by scientific study, and how conservation science can work to radically alter local epistemologies and subjectivities. What motivates me here is the desire not to analyze science in action (to borrow from Latour) at Crater Mountain but rather to start to understand how science as an imaginary or a "cosmology" (to use Stasch's term) has begun to allow people to recover some of the self-fashioning power that tourism once held. As Stronza rightly highlights, one of my goals is to understand the "prestige and romance" that is associated with scientific fieldwork and figure out why this sense of noble cause and action can work to wash away the shame often associated by tourists with acts of touristic consumption. As Walsh mentions, this work is meant to extend arguments that I made about authenticity, with James G. Carrier, in a previous paper (West and Carrier 2004). My argument here is that by imagining themselves as connected to science and scientific practice, the tourists in question paint their tourism and themselves as more authentic in nature than that of other travelers and other travelers themselves. My hope is that in addition to encouraging other anthropologists to think about scientific tourism as a form worthy of examination, this paper might also encourage people to think about the various ways that contemporary cosmopolitan transnationals seek to see and cast themselves as authentic while at the same time searching for authentic natures and cultures. My point is to ask the following: why does the language of science authenticate both self-fashioning and self-presentation for certain people?

Campbell and Gray argue that in the paper "scientists are the standard to which science tourists are compared and found wanting, but scientists themselves are not scrutinized" and indicate that I seem to be saying that scientists are somehow better than tourists. This is not a fair assessment of the paper nor of the larger body of work from which it extends. The scientific tourists discussed in this paper are "found wanting" not because they do not publish in peer-reviewed journals, contribute to the building of scientific knowledge, find themselves part of larger research teams or projects, have an association with an institution known for doing research, have some sort of formal training, or go through the rigors of

obtaining a research visa for the country (all of the markers I invoke in my initial distinction between scientists and scientific tourists). If they are "found wanting," it is because of the way that they rely on highly problematic images of nature and culture when they experience and portray Papua New Guinea. They do not seem to be able to see the residents of Maimafu as contemporary global citizens who have various wants and desires for their present and future and who just happen to have a relatively nice place to live with some interesting plants and animals in their immediate surroundings. They imagine them, experience them, see them, and then portray them using the well-worn savage slot and danger-of-loss tropes that I discussed in the beginning of the paper (see Trouillot 1991; Gewertz and Errington 1991). I find this troubling when it is scientific tourists, as described here, or scientists, as described elsewhere (West 2001, 2006*a*, 2006*c*).

—Paige West

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