

# Philosophy Unbound: Environmental Ethics at the End of the Earth

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Environmental challenges such as those facing the Cape Horn region of Chile exceed the competency of any disciplinary framework. Interdisciplinary approaches to knowledge—combining the expertise of several disciplines as well as the trans-disciplinary perspectives of the public and private sectors—require a unifying element that helps integrate such disparate perspectives. The field of philosophy, which traditionally has offered a view of the whole of knowledge, can serve in this role again, if philosophers are willing to embrace a de-disciplined expression of philosophy.

## I.

Southern Chile—the archipelago region from Puerto Montt (41°S) to the tip of Cape Horn (56°S)—faces a range of environmental challenges:

- Beaver and mink-impacted ecosystems
- Workers displaced from traditional occupations
- Salmon pens in once pristine lakes and fjords
- Climate change
- Deforestation and replanting with Eucalyptus plantations
- Mass ecotourism throughout the region
- The damming of rivers for hydroelectric power

The academy has a wide range of disciplines whose knowledge and perspectives are relevant for understanding and addressing such challenges, including:

- Ecology
- Economics
- Hydrology
- Political science
- Climatology
- Sociology
- History

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Success in addressing the challenges facing places such as southern Chile is thought to be a matter of matching problems with knowledge. In this essay, I explore this issue, the question of pertinent knowledge. I argue that a de-disciplined expression of knowledge, where the field of philosophy is redefined as the theory and practice of interdisciplinarity, has an important role to play in understanding what (if any) contributions knowledge can make for addressing the challenges we face.

## II.

At the dawn of the twenty-first century we find two globally dominant paradigms for addressing societal problems: markets and technoscientific knowledge. The two are closely linked. Since the 1970s, neo-liberal policies have placed markets in an ever more dominant position within society. Unshackled from governmental control, markets promote open competition in the production of ever more goods and services. This process, supposedly driven by consumer preferences, is in reality largely the result of the creation of needs through clever advertising. But in any case, the question of whether consumer desires serve as cause or result of production is moot, for at its root, the entire global system is based on an aesthetic of infinite desire. Capitalist and consumer, production and consumption are complicit: there is always another consumer durable or creature comfort being offered, supplied by the inventive processes of technoscience—a new computer, cell phone, or car.

It is striking how rarely the question is raised whether human happiness is truly increased via the infinite accumulation of more and more possessions. In recent years, social scientific research has broached this question,<sup>1</sup> and has found that once people are lifted out of poverty increased money and possessions do not correlate with increased happiness. It seems that after all the wise men of the past had it right: human happiness is rooted in the development of personal skills, strong family relations, and a vibrant life within a community. Moreover—and here *environmental* philosophy gets its purchase—there are serious questions about whether an accumulative lifestyle is ecologically sustainable. It would require the use of multiple Earths in order for India or China to acquire the standard of living currently “enjoyed” by citizens in the United States.

Largely inured to market forces, within the academy the ideology of infinite desire expresses itself in terms of “curiosity.” Curiosity is a modern shibboleth, marking those who embrace the mission of the infinite pursuit of knowledge. If outside the academy the market is the solution to every problem, within the academy additional knowledge has become the all purpose answer to every predicament.

Across most times and cultures people placed their trust in god (or the gods), king, or nature, accepting the world more or less as it presents itself. Beyond the narrowly pragmatic or technical, knowledge consisted of trying to identify one’s

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<sup>1</sup> E.g., Robert E. Lane, *The Loss of Happiness in Market Democracies* (New Haven: Yale University Press, 2000).

place in the natural (and supernatural) order, and in learning to moderate one's desires in order to live a good life, rather than an attempt at world making. Instead of seeking to manipulate the world, life's challenges were dealt with via faith, accommodation, and acceptance.

In contrast, modern academic culture places its faith in itself. Allied with capitalism and grown worldwide in scope, overwhelming other cultures, technoscientific knowledge embraces a linear hypothesis—that increases in knowledge necessarily lead to right action and the fulfillment of desires. On those occasions when disciplinary knowledge does *not* give a solution, the assumption has been that this problem can be addressed by . . . more knowledge.

Over the last sixty years, however, the knowledge society has been conducting an experiment in the pertinence of knowledge. Evidence has been accumulating that additional knowledge may not lead to solutions to our problems. Indeed, knowledge may not help at all—or, perversely, additional knowledge can actually make decisions more difficult. Recent examples of this phenomenon include: (1) climate change science: greater uncertainty concerning future climate change after the \$35 billion spent on the U.S. climate science program; (2) health science: the doubling U.S. National Institutes of Health (NIH) budget to \$29 billion between 1997 and 2003 shows no improvement in U.S. health statistics; (3) the 2000 U.S. presidential recount in Florida: sophisticated analysis of dimpled, two and three-cornered chads and different voting procedures made identifying a final number more rather than less difficult; and (4) the abortion debate: greater understanding of the mechanisms of conception and embryonic development has not led to lessening of conflict.

Faced with these results, thinkers both within and outside of academia are beginning to rethink the role of knowledge in society. Some have emphasized the need for greater *relevance* of research. For instance, in 2007 the U.S. National Science Foundation inaugurated a new competition called “SciSIP”—the Science of Science and Innovation Policy. The point of SciSIP is to improve the delivery of basic research to the marketplace. Other portions of the knowledge society have spoken of how the relevance of knowledge can be improved through *integration*—both across the academy, and between academia and society at large. Making knowledge more *interdisciplinary* would help to bridge the gap between knowledge and action.

*Interdisciplinarity* has now become its own code word, the guarantor of the enlightened nature of academic conversation. Generally such talk has remained just talk. This is no wonder, for the institutional and intellectual barriers to truly interdisciplinary teaching and research are daunting. Institutionally, standards of evaluation for tenure and promotion strongly favor disciplinarity—the phrase is in fact redundant, for the very idea of common standards of comparison implies the establishment of a discipline and a common measure. Moreover, intellectually or theoretically, the question of what constitutes interdisciplinary knowledge has formed remarkably little of a research project within the academy. Nationwide, one can find dozens of interdisciplinary centers (e.g., the Centennial Center for Interdisciplinary Science at the University of Alberta, or the Interdisciplinary Humanities Center

at the University of California, Santa Barbara), but the United States's first center for theorizing interdisciplinarity itself—the University of North Texas Center for the Study of Interdisciplinarity—was only launched in 2008.<sup>2</sup>

*Interdisciplinarity* then—pointing to a new era and means of knowledge management—today remains largely an empty signifier, more a marker of the crisis facing the knowledge industry rather than the beginning of a solution. Most commonly what flies under the flag of interdisciplinarity is actually multidisciplinary. Different types of disciplinary knowledge are juxtaposed and combined, but not truly integrated. As Julie Thompson Klein notes, the *multidisciplinary*

... juxtaposition fosters wider knowledge, information, and methods. Yet, disciplines remain separate, disciplinary elements retain their original identity, and the existing structure of knowledge is not questioned.<sup>3</sup>

Efforts generally stall at multidisciplinary because making knowledge interdisciplinary is slow, inefficient, and painful. It requires long hours to become conversant in another's vocabulary, method, and assumptions. In a culture that has made a fetish of efficiency such time and patience is nearly impossible to obtain. Interdisciplinary knowledge also calls on one's psychic resources. It takes decades of effort to master one's home discipline; interdisciplinarity is a humbling education into the limitations of one's training and expertise.

At the root, then, investigations into transcending disciplinary limitations themselves bump up against disciplinary structures of knowledge production. This problem has even extended to the academic study of interdisciplinarity, for which discipline has as its charge the study of the relations between and beyond the disciplines?

There is a traditional claimant to that role. At least through the time of Hegel (to 1831), philosophy was the field for thinking about the whole of knowledge. Since the late nineteenth century, however, philosophy has also become a regional rather than fundamental ontology—a field in principle no different from other disciplines, in that it examines a limited region of knowledge (e.g., logic, philosophy of science). In terms of orientation and temperament, the field has become filled by what the nineteenth-century philosopher William James called the “plaster-grey temperament of our balding young Ph.D.'s boring each other in seminars, and writing those direful reports of the literature in the *Philosophical Review*.”<sup>4</sup> But philosophy has been damaged by more than excessive specialization which neglects the development of a synoptic view of knowledge. There has also been a

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<sup>2</sup> See <http://www.csid.unt.edu>. The Association for Integrative Studies, founded in 1979, is the main institutional outlet for thinking about interdisciplinary research and education. Its focus has been on interdisciplinary education at the undergraduate level.

<sup>3</sup> Julie Thompson Klein, “The Taxonomy of Interdisciplinarity,” in the *Oxford Handbook of Interdisciplinarity*, ed. Robert Frodeman (Oxford: Oxford University Press, forthcoming).

<sup>4</sup> William James, quoted in Bruce Kuklick, *A History of Philosophy in America, 1720–2000* (Oxford University Press), 2003, p. 217.

failure to simultaneously think through the intellectual and institutional aspects of philosophy.

For knowledge to be more than idle chatter, we not only need a synoptic and integrative moment uniting the disciplines; this integration must be taken out into the field, involving stakeholders in the public and private sectors. Philosophy, then, not only needs to de-discipline, it also must change its institutional expression. Returning to the question animating this discussion—the various pressures facing Cape Horn—how can we unite the disciplines to address real world challenges such as those facing southern Chile? This perspective lies behind the work being done at the University of North Texas Department of Philosophy and Religion Studies, especially though the UNT-Chile Field Station.<sup>5</sup>

A “de-disciplined philosophy,” then, is characterized by three tasks. First, it seeks to provide an account of the specifically philosophical (ethical, aesthetic, epistemological, ontological, metaphysical, and theological) aspects of societal (in this case, environmental) problems. Second, it offers a synoptic narrative of the relations between the various disciplines (e.g., hydrology, chemistry, geology, public policy, economics) that offer insight into our problems. Such narratives can provide us with something that is sorely lacking today: a sense of the whole. Third, philosophers should seek out institutional settings and real world locations for instantiating the first two points. Akin to journalists in the two recent U.S.-Iraq wars, who placed themselves alongside troops in the field, they should play the role of “embedded philosophers.”<sup>6</sup>

In the rest of this essay I discuss the coupled theoretical and institutional barriers to de-disciplining environmental philosophy. I conclude with an examination of one of the issues confronting southern Chile, the question of beaver-impacted ecosystems in Cape Horn.

### III.

Environmental problems loom ever larger; yet, environmental philosophy remains a philosophic and academic afterthought. Environmental philosophers would like this situation to change. They feel, justifiably, that many of the problems society faces (environmental or otherwise) are at root humanistic rather than scientific or technical in nature, a matter of outlook and values rather than technique and fact. This marginal existence derives in part from the uncritical acceptance of environmental philosophy being placed within a disciplinary structure.

Despite being squeezed within a disciplinary notion of philosophy, environmental

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<sup>5</sup> See <http://www.chile.unt.edu>.

<sup>6</sup> D. Barben, E. Fisher, C. Selin, and D. H. Guston, “Anticipatory Governance of Nanotechnology: Foresight, Engagement, and Integration,” in E. J. Hackett, O. Amsterdamska, M. E. Lynch, and J. Wajcman, eds., *New Handbook of Science and Technology Studies* (Cambridge, Mass.: MIT Press, 2008), pp. 979–1000.

philosophers have found it difficult to gain the respect of “real” philosophers. Environmental philosophy is a stepchild of the discipline, relegated to the category of “applied philosophy” along with other marginalia such as bio-, computer, and engineering ethics.<sup>7</sup> While its high enrollments are welcomed by administrators, only rarely does it receive a serious commitment of departmental or university resources. Among the nation’s top philosophy departments, not one has an environmental philosopher as part of the regular faculty. Instead, faculty profiles announce “Topics that are of special interest include definitions, truth, meaning, and perception.” The lack of environmental philosophy, then, is not a matter of simple lacunae. Disciplinary philosophy exists at a level of abstraction and supposed rigor that precludes specifications such as environmental ethics.

True, there’s recently been an “empirical” turn within philosophy known as experimental philosophy or “X-Phi.” These philosophers do philosophy with clipboards and questionnaires, seeking data about people’s intuitions concerning questions of moral intentions. Kwame Appiah recently authored a piece for the *New York Times* describing this movement under the title of “The New New Philosophy.” He describes it as paradigm breaking: philosophers reading MRI brain scans to learn about how we puzzle out moral quandaries. But note the flow of the argument. Appiah describes the X-Phi Philosopher so: “The study was conducted by a philosopher, as a philosopher, in order to produce a piece of . . . philosophy” (ellipses in the original). Appiah ends by noting that

. . . although experiments can illuminate philosophical arguments, they don’t settle them. . . . To sort things out, it seems, another powerful instrument is needed. Let’s see — there’s one in the corner, over there. The springs are sagging a bit, and the cushions are worn, but never mind. That armchair will do nicely.<sup>8</sup>

This type of research is quite different from what de-disciplined environmental philosophers seek to accomplish—to integrate their insights with the work of scientists, philosophers, and policy makers for addressing real world problems.

If philosophers hope to influence conversations of non-philosophers, they need to realize that non-philosophers read philosophy papers only under duress. The solution is to get involved with their work rather than ask them to read ours. It is through work on a weekly basis with scientists or policy-makers that points such as the signature distinction of environmental philosophy—between instrumental and intrinsic value—can be better understood and integrated within ongoing public controversies, illuminating specific cases such as the development of the new management plan for Grand Canyon National Park, or managing the expansion of exotic species in South America.

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<sup>7</sup> See e.g., Leiter’s *Philosophical Gourmet* at <http://www.philosophicalgourmet.com>.

<sup>8</sup> Kwame Appiah, “The New New Philosophy,” in the *New York Times Magazine*, 9 December 2007. Available at <http://www.nytimes.com/2007/12/09/magazine/09wwln-idealab-t.html?pagewanted=all>.

These suggestions fly in the teeth of a set of assumptions that have defined academic philosophy for fifty years: that such an approach is not rigorous enough, or that such work is a simple (i.e., philosophically uninteresting) matter of “applying” concepts. Even within the field the topic of the institutional status and expression of environmental philosophy has not been considered philosophical enough to warrant being the subject of articles, conferences, and curricular and institutional reform. In this we are very much like the philosophic community generally, which since World War II has ignored the philosophic dimensions of the institutional setting and structure of philosophy. This is a shame, for the field is rich enough to embrace both the disciplinary specialties of recondite philosophy and the synoptic reach of field-based philosophic approaches.

To be sure, for fifteen years we have heard comments—most often from ecofeminists and environmental pragmatists—that environmental ethics needs to become more relevant. For example, Bryan Norton is well known for advocating a policy-oriented approach, where we try to think about environmentalism as a force in public policy first and to examine philosophical questions in passing. (Norton, it is worth noting, is located in a school of public policy rather than a philosophy department.) But none of this seems to have moved the needle. The reason is that we are still trying to make better or different arguments, rather than focusing on the institutional situation of and disciplinary limitations of environmental philosophy.

Few think about the institutional aspects of philosophy writ large. The most notable instance is University of Chicago philosophy and law professor Brian Leiter. His “Philosophical Gourmet Report” (<http://www.philosophicalgourmet.com>) has been ranking philosophy programs for ten years, and his blog is perhaps the best known in the profession in the U.S. Moreover, in 2004 he published an edited volume titled *The Future for Philosophy* which sought to lay out markers for what twenty-first century philosophy should be.<sup>9</sup>

On the first page of the introduction of *The Future for Philosophy* Leiter notes that philosophy has always been characterized by its insistent meta-philosophical questioning—posing questions about “what philosophy is, its proper concerns, methods, and limitations.” Leiter notes, however, that in addition to being explicitly posed, answers to this question are also developed “by the *doing of* philosophy” (emphasis in the original):

In this volume . . . some of the very best and most influential contemporary philosophers . . . are *doing* philosophy of mind, language, and science, as well as ethics, epistemology, feminist philosophy, and the history of philosophy.<sup>10</sup>

For Leiter, then, “doing philosophy” consists of constructing arguments—philosophers writing philosophy essays for other philosophers. There is no sign that he had

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<sup>9</sup> Brian Leiter, ed., *The Future for Philosophy* (New York: Oxford University Press, 2004).

<sup>10</sup> *Ibid.*, p. 5.

considered that there might be other kinds or ways of “doing.” (Leiter, a student of Nietzsche, might have considered “philosophizing with a hammer.”) After all, it is possible that the future of philosophy could turn on something other than theoretical debates between philosophers. We might, for instance, raise questions of whether philosophers should be housed (or housed exclusively) in philosophy departments, or whether they might be scattered across campus; whether or to what degree they can find homes beyond academia; whether philosophy is a “discipline” in the same sense as are other fields; and what public roles philosophy can take in these philosophical times. Of the thirteen chapters in *The Future for Philosophy*, not one raises any of these questions concerning the institutional future of philosophy.

Even when Leiter does consider the institutional expression of philosophy, his perspective remains remarkably unphilosophical. In the “Philosophical Gourmet Report” he does not even consider alternative methods of rating Ph.D. programs. The report prominently features a list of the philosophers whose opinions determined the results of the survey: 450 were canvassed; 270 replied. Of the 450 who were asked to respond, out of the approximately 15,000 philosophers employed in the U.S., all are employed at the so-called top universities (Leiter offers an account of his selection criteria). It will thus come as no surprise that Leiter’s results have been “remarkably stable” over the years. But more to the point here, Leiter not only fails to consider what the rankings might look like if a random cross-section of employed philosophers were surveyed; he also gives no thought to how *non*-philosophers might rank departments, or how programs could be evaluated according to citations outside philosophy journals, or by the amount of sponsored research they attract.

I have argued elsewhere for a policy turn within environmental philosophy—a focused and concerted turn outward, toward non-philosophers, training philosophers to be part of interdisciplinary teams working on projects with public agencies, policy makers, and the private sector.<sup>11</sup> Rather than aspiring to become philosopher-kings, advising presidents, or philosopher-isolates, writing for an audience of only a few, we need a different model for the role of philosophers. Call it the philosopher-bureaucrat—philosophers placed within institutional structures that dominate life today: the local water board, the regional EPA office, or the U.S. Forest Service, the places where the decisions are made and policies set.

*Bureaucrat*, of course, is a disagreeable word. No one wants to be labeled a “bureaucrat.” But philosophers have an obligation to think through the terms that rule our lives. The term has the virtue of truth, for we live in a bureaucratic age. Few of us would want it any other way. Whatever their burdens, bureaucratic structures such as the U.S. Federal Aviation Administration, the Food and Drug Administration, and the Environmental Protection Agency protect things that we deeply value, adding to the richness and safety of our lives. Developing the alternative philosophical

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<sup>11</sup> Robert Frodeman, “The Policy Turn in Environmental Philosophy,” *Environmental Ethics* 28, no. 1 (2006): 3–20.

model of the philosopher bureaucrat offers us a way to integrate environmental philosophy, and philosophy in general, into societal concerns and gain more attention and respect for our work.

At the 2006 annual meeting of environmental philosophers in Colorado, philosopher Dale Jamieson claimed that if the field wanted to gain more respect from the philosophical community, environmental philosophers needed to be “twice as good”: matching the philosophical skills of the top people in the field, while also mastering enough knowledge of environmental science or policy to be able to rigorously relate philosophic insights to our environmental problems. This, I suggest, is an impossible standard. To reach anywhere near the top of any specialized field today requires high intelligence plus a commitment to a more-than-full-time work schedule.

But even if such skills could be purchased by brilliance or sleepless nights, it would be a mistake. In his introductory essay, Leiter gives voice to the crucial assumption underlying philosophy and indeed the entire knowledge industry. Concerning a point so obvious that it could be placed within a rhetorical parentheses, Leiter claims that we must aim for the highest possible pitch of philosophical rigor: “(Which ‘camp’ of philosophy could possibly be committed to less careful analysis, less thorough argumentation?)”<sup>12</sup> But contra Leiter, analysis and argumentation are not paramount virtues. They are only two virtues among many, to be balanced with others such as timeliness, cost, and pertinence to one’s audience. As Aristotle notes, it is a sign of an educated person to seek only as much clarity as a subject matter admits of—or for that matter, needs. Rigor of argumentation should also be subject to a mean.

Certainly our environmental problems require a modicum of philosophy—and a great more than they currently get. But at this point, thirty-five years in, rather than simply more argumentation, what environmental philosophers most need is skill in “translation.” Master the basic arguments, yes, but then learn how to insert the pertinent insight into a non-philosophical conversation in a powerful and brief (!) manner. Philosophers should make sure that their graduate students become adept with the basic concepts of environmental philosophy. But once they graduate, they should understand that their careers need not consist of thirty or forty years of further sharpening of their philosophical razors. It is time to go abroad in the world and see what work can be done.

#### IV.

Yes, environmental philosophers are philosophers. But this fact does highlight the differences between two very different conceptions of philosophy. It need not be an either-or proposition; there should be room for continued philosophical detail work as well as a new type of philosopher-bureaucrat.

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<sup>12</sup> Leiter, *The Future for Philosophy*, p. 12.

Environmental philosophy should explicitly challenge the current, failed, and curiously ahistorical notion of philosophy that has dominated the academy for the last 100 years. Surely it is strange that the same people who pay homage to our philosophical ancestors—Socrates, Descartes, Leibniz, Nietzsche, William James—fail to recognize that if a young version of any of these thinkers showed up for a job interview today they would be dismissed out of hand. None of these people were specialists—people who Nietzsche dismissed as “dwellers in nooks and crannies.” None of them spent the majority of their time reading and writing for a philosophical audience. It is quite unlikely that they would unquestioningly adapt to the times and start reading and writing for the *Philosophical Quarterly* or *Nous*.

How did philosophy get to this point? A few turning points can be highlighted. Kant was a harbinger. In the *Groundwork*, originally published in 1785, he sought to apply Adam Smith to philosophy:

All industries, crafts, and arts have gained by the division of labor, viz., one man does not do everything, but each confines himself to a certain kind of work that is distinguished from all other kinds by the treatment it requires, so that the work may be done with the highest perfection and the greatest ease. Where work is not so distinguished and divided, where everyone is a jack of all trades, there industry remains sunk in the greatest barbarism. Whether or not pure philosophy in all its parts requires its own special man might well be in itself a subject worthy of consideration. Would not the whole of this learned industry be better off if those who are accustomed, as the public taste demands, to purvey a mixture of the empirical and the rational in all sorts of proportions unknown even to themselves and who style themselves independent thinkers, while giving the name of hair-splitters to those who apply themselves to the purely rational part, were to be given warning about pursuing simultaneously two jobs?<sup>13</sup>

Post-Civil War higher education saw Kant's program institutionalized via two developments—the creation of the undergraduate major, and the founding of the research university. The major and the elective system were created at Harvard in 1869, placing knowledge within disciplines and emphasizing specialization. In contrast with the traditional college, within the university it was possible for anyone to pursue a course of study in any field. The research university was inaugurated with the founding of Johns Hopkins in 1876. Rather than the collegiate focus on the preservation and integration of perennial truths, the research university defined the professor's work in terms of the endless pursuit of new knowledge.

Some philosophers protested this redefinition of philosophy in terms of specialization and expertise, but they were quickly overwhelmed. Philosophy became one more regional ontology with its own areas of recondite research in principle

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<sup>13</sup> Immanuel Kant, *Grounding for the Metaphysics of Morals*, trans. James W. Ellington (Indianapolis: Hackett Publishing, 1981), p. 2.

no different from any other discipline. In *Time in the Ditch* John McCumber adds another layer to the institutional history of philosophy.<sup>14</sup> In the 1950s and 1960s three factors came together: the arrival within the U.S. of analytic philosophy, the rise of McCarthyite persecution of academics, and a demographic boom and bust within the philosophy market. Analytic philosophy matched up well with the specialist-oriented research agenda of the research university. According to McCumber's research, McCarthy and his surrogates red-baited philosophers at a higher percentage than any other field within the academy. Finally, the bust of the academic job market in the late 1960s meant that the inward-looking, scientific orientation of analytic philosophy dominated philosophy departments for a much longer time than it might have otherwise.

Evolutionary change almost always comes from the periphery rather than from the center, from isolated locations where evolutionary advances can develop without being overwhelmed by the status quo. Only later do they bring their innovations into the mainstream. It is possible and even likely, then, that new models of philosophy and of academic work in general will first take hold at the end of the Earth.

## V.

In 1946 the Argentinean navy released twenty-five pairs of North American beaver (*Castor canadensis*) in the forested area of Fagnano Lake on the island of Tierra del Fuego.<sup>15</sup> The navy's goal was to bolster the local economy through the development of a fur industry. The plan never prospered, but the beavers did quite nicely. The absence of natural predators and human hunting for beaver and the suitability of the terrain allowed the offspring of these hardy pioneers to spread far beyond the lake. Beaver were soon established throughout the region—migrating up streams, crossing highlands, and swimming from island to island. By the 1990s, fifty beaver had become more than 50,000.<sup>16</sup>

The beaver have also left marks on the landscape. Aerial photographs of the Cape Horn region show areas of new marshland and meadows, and the tree canopy has been reduced along stream banks. Research has documented changes in habitat structure and the species composition of fish, algae, freshwater invertebrates and bird assemblages as well as the increased retention and deposition of organic

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<sup>14</sup> John McCumber, *Time in the Ditch* (Evanston: Northwestern University Press, 2001).

<sup>15</sup> M. Lizarralde, and C. Venegas, "El Casto: Un Ingeniero Exótico en las Tierras Mas Australes del Planeta," in R. Primack, R. Rozzi, P. Feinsinger, R. Dirzo, and F. Massardo, eds., *Fundamentos de Conservación Biológica: Perspectivas Latinoamericanas*, 2d ed. (Mexico City: Fondo de Cultura Económica, México, 2006), pp. 231–32; C. Anderson, R. Rozzi, J. C. Torres-Mura, S. McGehee, M. Sherriffs, E. Schuettler, and A. Rosemond, "Exotic Vertebrate Fauna of the Remote and Pristine Sub-Antarctic Cape Horn Archipelago, Chile," *Biodiversity and Conservation* 15 (2006): 3295–13.

<sup>16</sup> Lizarralde and Venegas, "El Casto," p. 231.

materials.<sup>17</sup> Moreover, the beaver have crossed the Magellan strait and look to be moving further northward. Southward, they have reached Navarino Island and could reach the pristine Cape Horn archipelago, the last land before Antarctica.<sup>18</sup>

Weighing the scientific, social, economic, political, and ethical aspects of the penetration of the beaver in the region presents a difficult challenge. The beaver have in one sense become “native”: Puerto Williams has adopted the beaver as a town mascot. The choices for addressing the beaver question come down to four: eradicate, control, tolerate, or promote.<sup>19</sup> At least the first two would require economic resources, and any of these choices would need to garner political consensus. Moreover, any debate over the fate of the beaver will in part turn on an interdisciplinary account that combines scientific data, environmental philosophy, and economic and political realities on the ground. How, for instance, does one define *exotic*? How long must a species be in a location before counting as a native? Does it matter how the species was introduced (e.g., by their own initiative, or by human actions)? By what criteria do we establish that exotics or the landscape changes they initiate are “bad?”

Such questions are not “answered” in the sense of identifying a unique solution. The same for the overall question of how to handle the beaver question of Cape Horn, which will be only be addressed via an ongoing debate among the communities that are affected. Such a debate will be inter- and transdisciplinary rather than disciplinary in nature, political rather than scientific in structure. The academy has disciplines, but the world has problems. These problems inevitably overwhelm every disciplinary boundary. Mono-disciplinary approaches are almost always doomed to failure, promising as they do the dream of isolating an answer from the welter of facts, values, and perspectives. Our challenges defy such an approach. The world is more complex than that.

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<sup>17</sup> C. Anderson, A. Rosemond, G. Clayton, R. Rozzi, and O. Dollenz, “The Effects of Invasive North American Beavers on Riparian Plant Communities in Cape Horn, Chile,” *Biological Conservation* 128 (2006): 467–74.

<sup>18</sup> *Ibid.*

<sup>19</sup> S. Haider and K. Jax, “The Application of Environmental Ethics in Biological Conservation: A Case Study from the Southernmost Tip of the Americas,” *Biodiversity and Conservation* 16, no. 9 (2007): 2559–73.