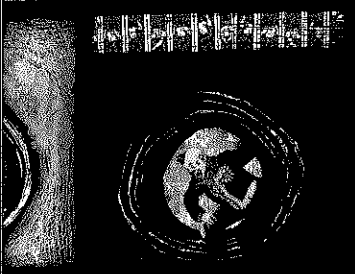
ultures offers "glimpses"
n expanding universe
owledge, beliefs and
ces characterized by the
uman activity is governed
and functioning of the brain.
he Decade of the Brain,
dred years of the new
been proclaimed its
ed as the most complex of
rain has become a major
orary culture. Brain imaging
used in a large number of
are increasingly applied in
tial social and legal relevance.
imed that the neurosciences
major transformations
ractices of the human in
as spirituality and self-
, the law, education, or the
d treatment of mental disease.
xplores these expectations,
ir contexts, and the debates
road range of fields, including
editation, neuroethics,
," psychedelic research,
psychiatric and neurological
cinema and literature.

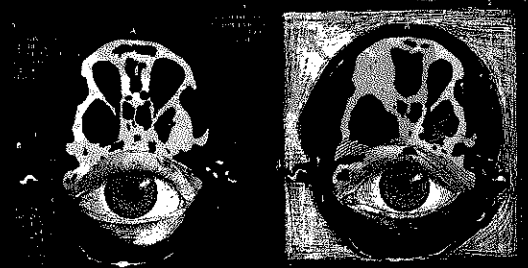
is Associate Professor at the
ial Medicine, State University of

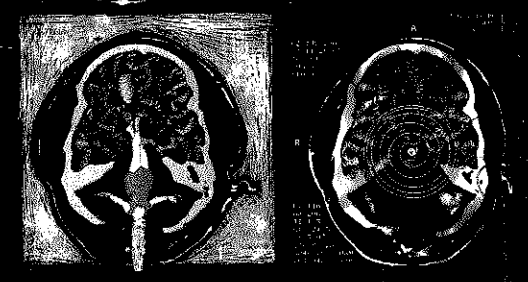
is Research Scholar at the Max
for the History of Science, Berlin.

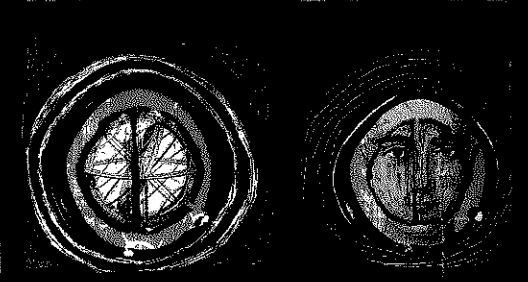
de

n
Aldworth, *Cogito Ergo Sum* 3, 2006.
140 cm. Courtesy of the artist.









PETER LANG

INTERNATIONALER
VERLAG DER
WISSENSCHAFTEN

ISBN 978-3-631-59855-9

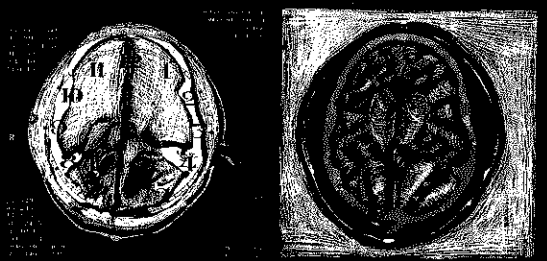
9 783631 598559

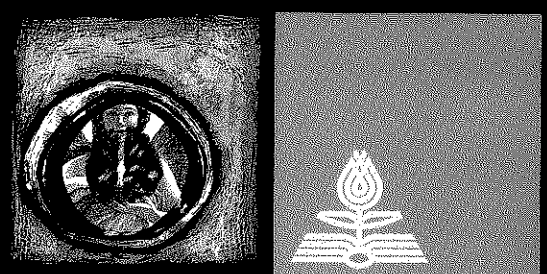
Neurocultures

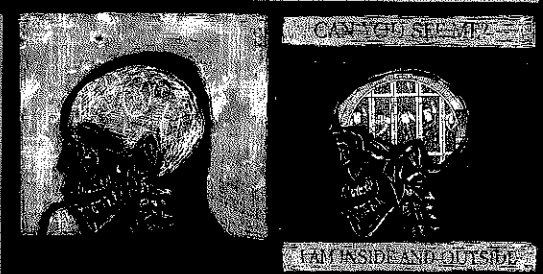
Glimpses into an Expanding Universe

F. Ortega and F. Vidal (eds.) Neurocultures

LANG







EDITED BY

Francisco Ortega
and Fernando Vidal

PETER LANG

INTERNATIONALER
VERLAG DER
WISSENSCHAFTEN

Bibliographic Information published by the Deutsche Nationalbibliothek
The Deutsche Nationalbibliothek lists this publication in the Deutsche Nationalbibliografie; detailed bibliographic data is available in the internet at http://dnb.d-nb.de.

Cover: Victor Burton
Cover Image: Susan Aldworth,
Cogito Ergo Sum 3, 2006, giclee print, 175 x 140.
Courtesy of the artist.

ISBN 978-3-631-59855-9

© Peter Lang GmbH
Internationaler Verlag der Wissenschaften
Frankfurt am Main 2011
All rights reserved.

All parts of this publication are protected by copyright. Any utilisation outside the strict limits of the copyright law, without the permission of the publisher, is forbidden and liable to prosecution. This applies in particular to reproductions, translations, microfilming, and storage and processing in electronic retrieval systems.

www.peterlang.de

NEUROCULTURES

GLIMPSES INTO AN EXPANDING UNIVERSE

EDITED BY
FRANCISCO ORTEGA AND FERNANDO VIDAL

Table of Content

Approaching the Neurocultural Spectrum: An Introduction
FERNANDO VIDAL and FRANCISCO ORTEGA 7

I *Practices of the Cerebral Subject* 29

1 Toward a Genealogy of Neuroascesis
FRANCISCO ORTEGA 31

2 Experimental Ethics and the Science of the Meditating Brain
JOHN TRESCH 49

3 Neuronal Expressivity: On the Road to a New Naturalness
GESA LINDEMANN 69

4 Neuroscience's Impact on our Self-Identity:
Perspectives from Ethics and Public Understanding
ERIC RACINE and ZOË COSTA-VON AESCH 83

II *Dynamics of Naturalization* 99

5 The Cerebral Subject at the Junction
of Naturalism and Antinaturalism
MAURIZIO MELONI 101

6 The "Social" Brain: An Epistemological Chimera
and a Sociological Truth
ALAIN EHRENBERG 117

7 Political Neurotheology: Emergence and Revival
of a Psychedelic Alternative to Cosmetic Psychopharmacology
NICOLAS LANGLITZ 141

8 Psychoanalysis and the Cerebral Subject
JURANDIR FREIRE COSTA 167

9 Visualizing Disgust: Subtractions and Assimilations in the Production of Neuroscientific Knowledge
SIMON COHN 181

III *Cerebralizing Diagnostics* 199

10 Seduced by Plaques and Tangles: Alzheimer's Disease and the Cerebral Subject
MARGARET LOCK 201

11 On the Political Economy of the "Gambling Brain"
SCOTT VRECKO 217

12 "Nature's Experiment:" Epilepsy, Localization of Brain Function and the Emergence of the Cerebral Subject
CATHY GERE 235

13 Looking for Experience in the Brain: Psychoanalysis and the Project of Naturalizing Mind
BENILTON BEZERRA 249

IV *Art Facts, Science Fictions* 271

14 The Physical Brain and the Sense of Self: An Artists's Exploration
SUSAN ALDWORTH 273

15 Brains, Art, and the Humanities
ROBERT ZWIJNENBERG 293

16 Larger Than Our Biologies: Identity and Consciousness in Contemporary Fiction
VALERIA GENNERO 311

17 Fiction Film and the Cerebral Subject
FERNANDO VIDAL 329

The Authors 345

Index 351

APPROACHING THE NEUROCULTURAL SPECTRUM: AN INTRODUCTION[1]

Fernando Vidal and Francisco Ortega

The belief that human beings are essentially their brains – that, as French philosopher Stéphane Ferret (1993: 79) put it, person P and person P* are identical if they have one and the same functional brain – has become extremely powerful in contemporary culture. Especially since the mid-20th century, the anthropological figure of the "cerebral subject" has emerged as a major feature of industrialized and highly medicalized societies, with a great diversity of social inscriptions and embodiments both inside and outside the philosophical, neuroscientific and psychological fields (Vidal, 2005, 2009). As we discuss below, depicting oneself or others as being somehow reducible to the brain incarnates only one type of description, which coexists with others and is used only in certain contexts. Psychoanalytic clients may walk into the consulting room excited about having learned something about possible neurobiological underpinnings of their malaise, to find themselves a few minutes later engaged in exploring the psychodynamic mechanisms that contribute to make sense of their lives. These persons are not inconsistent – they simply illustrate the obvious fact that life is overdetermined. Although this certainly also applies to those engaged in neuroscientific research, some scientists have, at least by their public pronouncements, contributed to reduce to the brain the range of determinants of human existence.

Thus, Semir Zeki, professor of neuroesthetics at University College London, considers his approach to be dictated "by a truth that [he] believe[s] to be axiomatic – that all human activity is dictated by the organization and laws of the brain" (Zeki, 2002: 54). Similarly, commenting on the thought experiment of brain transplantations and the usual view that, if feasible, they should be considered full-body rather than brain transplants, Michael Gazzaniga (2005: 31) wrote, "This simple fact makes it clear that you are your brain." It is likely that neither Zeki nor Gazzaniga nor Ferret (who offered his formula to epitomize a widespread position in Anglo-American discussions of personal identity), nor any of the many other neu-

1 *Neurocultures* grew out of a conference we organized in Rio de Janeiro in 2006 and a workshop (organized by Nicolas Langlitz and Fernando Vidal) that took place in 2009 at the Max Planck Institute for the History of Science. Some of the contributors to this volume participated in those events. The German Academic Exchange Service (DAAD), the Brazilian agency for the promotion of academic research (CAPES), the Max Planck Institute for the History of Science, and the BIOS Centre at the London School of Economics sponsored the meetings. We thank all of them for their support, and for the opportunity to bring together students and scholars from very different educational contexts. In this volume, we have tried to preserve the diversity of academic cultures, backgrounds and styles, and hope the result will be better for that.

Tannen, Susan. n.d. "Mental fitness – exercises for the brain." www.bellydoc.com/articles/article7.htm.

Teahan, John. 1979. "Warren Felt Evans and mental healing: Romantic idealism and practical mysticism in nineteenth-century america." *Church History*, 48(1), 63-80.

Van Wyhe, John. 2004. *Phrenology and the Origins of Victorian Scientific Naturalism*. Aldershot, Ashgate.

Vidal, Fernando. 2009. "Brainhood, anthropological figure of modernity." *History of the Human Sciences*, 22(1), 5-36.

Wells, Carol G. 1989. *Right Brain Sex. Using Creative Visualization to Enhance Sexual Pleasure*. New York, Simon & Schuster.

Wigan, Arthur L. 1844. *A New View of Insanity. The Duality of the Mind Proved by the Structure, Functions, and Diseases of the Brain and by the Phenomena of Mental Derangement, and Shown to be Essential to Moral Responsibility*. Malibu, California, Joseph Simon, 1985.

Winter, Arthur, and Winter, Ruth. 1987. *Build Your Brain Power. The Latest Techniques to Preserve, Restore, and Improve Your Brain's Potential*. New York, St. Martin's Press.

Wolbring, Gregor. 2007. "Neurodiversity, neuroenhancement, neurodisease, and neurobusiness," *Innovation Watch*, 15 May. www.innovationwatch.com/choiceisyours/choiceisyours-2007-04-30.htm.

2

Experimental Ethics and the Science of the Meditating Brain

John Tresch

"A Matter of Experimental Design"

On the fourth day of the 2006 Mind and Life Summer Research Institute, Adam Engle, CEO of Mind and Life, took the microphone for a special announcement. Since 1987, Mind and Life has fostered dialogues and collaborations between Western science and contemplative traditions, primarily Buddhist; since 2004, the Summer Research Institute has convened every year in the chapel of the Garrison Institute, a former Capuchin Monastery on the Hudson River one hour north of New York City. As had been the case all week, that morning's talks and discussions, involving about 120 neuroscientists, meditation teachers, and students of each, had dealt with the effects of meditation on various neuropsychological phenomena as measured by EEG and fMRI, as well as the theory and practice of meditation. The intervention from Engle, a compact, gruff-voiced, shaven-headed man in his fifties, was unprecedented.

He reminded the audience that this yearly meeting was a unique event, and said that he felt compelled to speak because of an issue that that had arisen that ran counter to this "unique design". It had been brought to his attention that two nights earlier, some of the participants had left the grounds and gone to a local bar. When they came back they made some noise at the front of the building, possibly disturbing those inside. Adam said:

> Going out and bringing alcohol back on campus in your bodies... is contrary to our experimental design, it's toxic to our environment... I really want to ask you ... to refrain from these possibilities. If you see that craving arise, check in with your state of mind and just observe it. It's not a matter of morality at all, it's a matter of experimental design.

The session, like those before and after it, closed with the sounding of a bell; one by one, students lifted themselves from the blue square mats and round cushions, from the rows of chairs behind them and from the pews lining the walls. The echo of chatter followed them out the door. The event was discussed in the hallways and later in the dining hall. Who had left? What had actually happened? Was someone in trouble? Would there be a response? In the course of a week-long event, in which all planned events had run smoothly and in which friendly exchange between people with very different backgrounds and expectations had been the rule, this moment of public friction stood out.

I'll return to this minor controversy and the way it made the "uniqueness" of this setting visible later in this paper. For now, I want to pause at Engle's evoca-

tion of the "experimental design." Like other events sponsored by Mind and Life, this summer school creates a sustained, face-to-face encounter between established neuroscience researchers, grad students, eager undergraduates, renowned meditation teachers, a handful of monks, and religious scholars who join to discuss and undertake different ways of learning about the mind – some by quiet concentration and introspection, others by applying multi-million dollar magnetic resonators, generating avalanches of numbers subsequently converted into digital maps of brain activity. It is a double experiment, then: both to pursue new lines of research on neural correlates of meditation and to give scientists a chance to experience their own minds through meditation.

It is also an experiment in creating new forms of life, new ethical experiences and practices. Mind and Life stands at the point of convergence of two important developments in the understanding and experience of the self in the U.S.: on one hand, the rise of the neurosciences and their compelling combination of experimental intervention, psychopharmaceutical modification, and dazzling graphics of "your brain on X"; on the other, a fascination with Buddhist cosmology, practice, psychology, ethics, and iconography that has grown in cultural salience since the mid twentieth century. Mind and Life was formed twenty years ago to foster dialog between Western science and Eastern traditions of meditation, by Engle and Francisco Varela, Chilean mathematician, neuroscientist and meditator. Mind and Life began with meetings in Dharamsala, India, with the Dalai Lama, monks, and Western researchers discussing science from the standpoint of Buddhist philosophy and vice versa. Although Varela died in 2001, Mind and Life under Engle's direction (and with continuous input from a handful of scientists and contemplatives and funding from private donors) has steadily expanded its activities and public profile.

Philosophers have long been fascinated by juxtapositions between Western science and Eastern philosophy, from Schopenhauer and Nietzsche to *The Tao of Physics* and *The Dancing Wu Li Masters* of the 1970s (on Buddhism's transformations as it has entered the West, see see Coleman, 2002; Downing, 2002; Lopez, 1998, 2008; Prebish, 1999). Like these precursors, clashes and convergences at the level of theory, concepts, or facts form a central line of discussion in Mind and Life's publications. Yet another line of comparison is equally important though less often discussed. Just as Right Action, Right Livelihood, and Right Speech are indispensable aspects of the Eightfold Noble Path, so have scholars analyzed the importance of moral values and ethical practices in the conduct of modern science (Daston, 1995; Kohler, 1991; Lawrence and Shapin, 1998; Merton, 1996). The present chapter is located at this level of analysis.

Unfortunately, the most prominent Western discourse dealing with the ethics of science, bioethics, offers little assistance for understanding this setting. Bioethics, and its brainy offspring, neuroethics, base their arguments either on deontology (duty, dignity and rights of the autonomous individual) or utilitarian good (harms and benefits for the greatest number) (Chatterjee, 2004; see Farah, 2005; Moreno, 2003).

Many of neuroethic's central concerns are simply non-issues in the context of Buddhist meditation. The worry that neuroscience erodes belief in a coherent self or soul is moot, as the Buddhist notion of *anatta*, or the merely conventional reality of the self, also brings about such an erosion. Nor is Buddhism threatened by the idea that by seeking physical, mechanical causes for cognition or consciousness, neuroscience annihilates free will: the concept of karma already seriously circumscribes conceptions of individual agency. Perhaps the most interesting case of Buddhist indifference to the fears raised by neuroethics is the question of the "naturalness" of neural enhancements. Neuroethics (like bioethics more generally) often voices concerns that modifications by drugs or technology imply a disfiguration or violation of "nature"; despite all the changes this concept has undergone, "nature" remains a moral touchstone (Daston and Vidal, 2004). Buddhism inverts this conception: the modifications brought by mental training are not artificial; they are steps toward a natural state in which practitioners have cleared away clouds of delusion and drawn nearer to their true nature. From the Buddhist perspective, a change of mental habits (which, as contemplative neuroscience seeks to demonstrate, corresponds to a quantifiable neural modification), far from being unethical, is in fact the central theme of ethics. Without altering one's mind (and brain) it would be hard to be a good person at all.[1]

These examples suggest the cultural limitations of bioethical discourse. Without question, the issues raised by the intersection of neuroscience and Buddhist practice are philosophically rich; yet to study how these oppositions and convergences work themselves out in practice, it is useful to turn from philosophy to ethnography. Contemporary forms of science and meditation each belong to ecologies of distinct practices, values, emotions, notions of personhood, and ethical systems; this fabric of everyday activities and understandings constitutes the foundation for later theoretical or philosophical differences.

This paper is drawn from the early stages of an ethnographic study of Mind and Life. I focus on the Mind and Life Summer Research Institute (MLSRI) as a site of ethical experimentation. Michael Fischer has suggested that contemporary sciences have a tendency to create "experimental forms of life," as they bring together diverse expertises in settings whose nature is open to debate. Its events convoke not only multiple human actors (scientists, students, philosophers, celebrity philan-

1 One important intersection between neuroethics and Buddhist ethics lies in issues of distributive justice and access. In principle, meditation and the benefits it might provide are free and open to all. Yet the social channels that provide access to meditation in America are unequally distributed; exposure to the teachings tends to follow predictable pathways corresponding to education and class; further, not everyone can afford to be "unconcerned by material things" and take the time to do retreats. One participant at Mind and Life, an Asian-American female, noted the narrow access to both meditation and high-level science in the USA as reflected in the group's demographics: "I look around me," she said, "and I see it's mostly middle-class, white people here" (MLSRI, 2005).

thropists, Tibetan monks, and Burma-trained Californian monks), nor just wildly different non-human actors (fMRI machines, control groups, amygdalas, hospitals, funding agencies, research norms, boddhistavas, devas, the law of karma), but distinct forms of life which include opposed epistemologies, metaphysics, and ethical practices. The explicit ambition of Mind and Life is to create a new field of science. To do so it forms mixtures of heterogeneous elements, deliberately and reflexively creating new spaces, communities, and subjects along the way.

Hybrid Spaces

Like other contemporary technoscientific networks, Mind and Life is not located in a single place; until recently, organizational work was done in the homes of Adam Engle, and the Administrative Director, Nancy Meyer, near Boulder, Colorado, though as of late March 2008, the staff had expanded to about ten people and the search for a first permanent office was underway. Despite this institutional consolidation, Mind and Life remains most visible in nomadic sites in which various aspects of the community are made temporarily visible. In addition to phone and email contacts, these are the places in which I am conducting my research:

Public Representations

Beginning with the meeting of 2003 held at MIT, the meetings with the Dalai Lama have gone public; in 2005, they met in Washington D.C, and in fall 2007 at Emory University. There is also considerable coverage in the mass media. Richard Davidson, a researcher in affective neuroscience at the University of Wisconsin-Madison has emerged as Mind and Life's most visible representative; in 2006 he was profiled in *Time* as one of "the 100 people who shape our world" along with Condoleeza Rice, George Clooney and the Pope; in March 2008 he was interviewed in *O* magazine and by the BBC in early April. Of interest is the ways that the neuroscience of meditation gets framed for mass consumption: what gets communicated or not in brief sound bites and beneath stage lights in front of 3000 people. Equally intriguing is the function of the Dalai Lama's religious rock-star persona and the entwinement of this persona with U.S.-China relations.

Lab and Clinical Studies

A second site is fieldwork in neuroscience laboratories. One approach involves "basic research" on "expert meditators" who have clocked 10,000 or more hours of meditation (usually Tibetan monks). The search is for robust differences in brain functioning between adepts and "normals"; a recent paper with first author Antoine Lutz, student of Varela and researcher at Davidson's lab, showed a significant increase of gamma oscillations synchronized across the brain during meditation by experienced adepts; this unusual pattern of electrical activity was absent in controls.

Such findings are cited by those at Mind and Life as offering spectacular support to the claim that meditation changes the brain (Brefczynski-Lewis et al., 2007; Lutz et al., 2004).[2] Even more striking is research that shows visible changes in brain morphology – an increase of cortical thickness – in long-term meditators (Lazar et al., 2005).

The other approach is clinical: the study of meditation's impact on depression, anxiety, anorexia, addiction, and pain. Most of this research employs a version of the Mindfulness Based Stress Reduction program developed by Jon Kabat-Zinn. Often situated in hospitals, the program meets weekly for eight weeks, followed by a final day-long session. Though less exotic than lab-based research on scarlet-robed monks, it is here that meditation reaches many people's lives.[3] Kabat-Zinn acknowledges the Buddhist roots of mindfulness, yet his training is carefully framed as a secular intervention that in no way conflicts with patients' religious convictions (or lack thereof).[4]

This research will build on the work of previous ethnographies of neuroscience. What are the chains of translation that connect a ritualized interaction between people and machines, through to the inscription of electric signals, to the production of raw numerical data, to statistical analysis, and from there to graphs, images, and eventually a "brain"? How is the "self-as-brain" assumed or produced by these encounters? What kind of social space is the laboratory, and does it change when the object is meditation?[5]

Shamatha Project

In the mountains north of Denver from February to December 2007 two separate groups of 30 meditators took a three month intensive meditation retreat where they learned the Tibetan concentration practice of Shamatha. At the start, middle, and end they were subjected to several hours of cognitive and affective neuroscience

2 Methodological problems have been acknowledged with these studies: samples are small; there are no obvious controls for Tibetan monks for whom all conditions would be the same except for the meditation; nor is there presently any way to know about their brains before they started meditating.

3 By various sociological markers, it also appears in some cases to be a lower-status pursuit: The field is wider; samples are larger; evaluation methods include self-reports; researchers often have dual appointments in hospitals, as messy "clinical" work it lacks the austere tidiness and high-cost equipment of high-flying laboratory research; see Bourdieu (1975).

4 Kabat-Zinn (1982), Carlson et al. (2003), Brown (2003), Goldenberg et al. (1993), Kristeller and Halleh (1999), Segal et al. (2002), Teasdale et al. (2000), Zachariae et al. (1996). On MBSR see Kabat-Zinn (1990). A program related to MBSR is administered at the University of Pennsylvania; one of its instructors, Michael Baime, who is also an M.D. in the medical school, offers a meditation "lab" in attention researcher Amishi Jha's course on "Neuroscience of Meditation" which I attended in the fall semester of 2008. See Jha et al. (2007).

5 Latour (1988), Beaulieu (2002), Dumit (2004), Roepstorff (2001, 2004), Alac and Hutchins (2004).

testing with full EEG caps, blood pressure and eye-twitch monitors. Six researchers lived there with them, administering the tests. The Principal Investigator, Cliff Saron of the University of California Davis, and the teacher, philosopher and ordained monk in the Tibetan tradition, Alan Wallace, aimed at a rigorous, longitudinal examination of the impact of meditation on attention, memory, stress response and emotional regulation. Results are still being analyzed. As of September 2009, preliminary results indicated that participants showed improvement in "overall psychological functioning," increases in and sustained voluntary attention, and there were also indications of possible improvements to health related to cell aging, based on analysis of teloemeorase levels and the length of telomeres. As a visitor to this high-tech monastery for four weeks, in February and May 2007, I was able to observe the complexities of the interdependent but ritually separated community formed by staff, retreatants, and scientific workers. The fact that the site resembled nothing so much as a science fiction film highlights the innovative, hybrid spaces that this research is calling into existence.

Summer Research Institute

The Mind and Life Summer Research Institute, the focus of this paper, meets for one week every summer at the Garrison Institute on the Hudson River; I have attended three of the first four Summer Institutes, and the fifth and sixth took place in June of 2008 and 2009. Half conference, half retreat, the meeting occurs primarily in the monastery's chapel which serves as both academic conference room and meditation hall. The MLSRI aims, in Engle's words, "to grow and breed a new generation...at the interface between impeccable scientific research and contemplation." In addition to reporters and donors marked by special nametags, the core group of organizers and the fifteen "faculty members" who speak on stage – scientists, meditation teachers, and monks – are leaders in their fields, while the 80 junior and 40 senior researchers – graduate students, postdocs, professors – are accepted on the basis of an application essay, references, and curriculum vitae. For seven days, participants share meals, bathrooms, conversations and meditation sessions; the MLSRI is a temporary total institution. As an event in which the community's values and practices are introduced and reinforced, it offers a particularly revealing lens on the commitments of Mind and Life.

A Double Initiation

One of the explicit aims of the MLSRI is to heal a sick culture. Opening the second such meeting in 2005, Engle explained:

> We're making some pretty crazy decisions as a culture; something is wrong with people's minds if they make such wrong interpretations about what will make them happy.

Commercialism, materialism, and violence are conditions that meditation may help cure. In the West, proof speaks the language of science; scientific confirmation of the benefits of meditation may make more people take it seriously as a way out of suffering. To reach this end, organizers were strikingly explicit about their multi-front strategies "to make a change in the culture...", "in a heavily leveraged way:" building strong facts, gaining allies and resources, securing credibility. This requires the full quiver of strategies for consolidating a new scientific field. Said Davidson:

> If we're really going to change the culture... we need the aspiration to have effects as wide and deep as possible.... We have to influence the most important, most powerful and prestigious institutions. The only way to do this is by playing their game as well as or better than they do... This will require a lot of time, homework, money. [We need to aim for] the very highest level of respectability [and] to pursue this research at the very highest level.... The people in this room are poised to do this. They have the credentials, the wherewithal, the resources, and dharmic background. It's going to have to happen at a level we've never before seen on the planet. (Day 1, 2006)

Cognitive scientist David Meyer agreed: "The bottom line for Mind and Life is peer-reviewed publications in well-respected journals... *Science, Nature, Neuroscience*." In his introduction on the first night of the third meeting 2006, Jon Kabat-Zinn announced that this "this is a truly Copernican moment. Nothing like this has ever happened on the planet." But just as the Copernican revolution involved the creation not just of new ideas but new networks of intellectuals, patrons, and public representations within an unsettled political context, so is Mind and Life moving on many fronts at once.

Though the Summer Institute is one of the central planks of this strategy, its actual nature is notably unsettled. As Kabat-Zinn put it: "We're going to be living with a big question here: What actually is this?" Some used the word "conference" to refer to the meeting, while others consistently called it a "retreat." Like Wittgenstein's duck-rabbit, the event formed an unstable gestalt in which certain characteristics could be made more or less prominent. The use of space manifested this duality, as in the monastery's chapel, at once academic conference room and meditation hall. About 50 meditation cushions were put before a low stage, with rows of chairs behind: the altar was a stage for power-point displays, panels and rapid-fire lectures, with a golden Buddha statue in the holy of holies. This duality also played out in the distribution of time: From 9 a.m. to 9 p.m there were lively talks and discussions, office hours and small group meetings; yet participants were asked to maintain complete silence from the 9 p.m. sitting till after breakfast.

As a planned and supervised immersive training which aims at shaping individuals and strengthening a community, the MLSRI can be seen as an initiation ritual. It follows Victor Turner's analysis of rites of passage (Turner, 1995), with its separation from society, formation of a "liminal" state of *communitas* in which social distinctions are reversed or deemphasized, and "reaggregation," or transition back

into society in a new state of being. However, the Research Institute complicates Turner's model by combining two distinct initiation rites, with their distinct ethical ideals and models. It is a hybrid of a meditation retreat and a scientific conference; two ideal ritual types aiming at the formation of distinct kinds of selves. Building on Foucault's discussion of ancient ascetic practices, we see here coordinated processes of subjectivation that structure the self's relation to the self. The intended outcome is twofold: the production of scientific selves and contemplative selves.

Subjectivation System A. Conference

A scientific conference is an intense learning experience, at once intellectual, emotional, and physical. At the MLSRI there were several lectures daily. Topics included the effects of meditation on memory, attention, fear response and sleep; structural changes in the brain; the problem of defining the "baseline state" against which to compare functional changes; pitfalls in choosing a control group, the dangers of self-reporting. Technical and practical guidance were offered in small groups and office hours, along with some mentoring. Lunch and coffee breaks were often raucous.

On stage, scientific presenters often invoked Mertonian norms, along with rigor, quantification, thoroughness, and tractability; there was a continual insistence on applying the highest possible scientific standards to this new object. Other learning passed without words. Beyond reverent allusions to icons like Einstein and William James, the most compelling models of scientific selfhood were the men and women on stage, many of whom presented themselves as living proof that conducting research on meditation, and even, as they put it, "coming out of the closet" as a meditator, do not prevent scientific success. Though there were many variations in style, the "leading" scientists spoke with a declarative assurance; they praised colleagues's work and appraised the limitations of their own approaches. Unlike other conferences (as some participants noted), comments here were never destructive and rarely negative at all. Forthrightness, confidence, generosity, and reliability were conveyed by gestures, physical postures, facial expressions, and tones of voice. These "positive" scientific values were manifested and often explicitly noted by the scientific presenters.

Other values intrinsic to "being a successful scientist," slightly less socially esteemed and less altruistic, were also acknowledged and manifested: the importance of gaining the support of prestigious institutions, making powerful allies, carving out a unique research niche, building a reputation, accumulating honors, and assembling and controlling resources. At the risk of stating the obvious, at conferences people meet and share techniques, findings and references; they may also be measuring each others projects and skills and doing reconnaissance on funding, employment, and disputed intellectual regions. By making new contacts, improving or diminishing reputations, settling scores or renewing friendships, participants may emerge from such rites of passage with their identities solidified in a new position in the

stratified topology of their field. These more realpolitik scientific ideals were also there to be observed and emulated, though less often taught explicitly.

Subjectivation System B. Retreat

A meditation retreat also aims to bring about a transformation. Meditation sessions were frequent but instructions were basic; although it was stated that one of the aims of the meeting was to expose people to Buddhism, explicit teaching of doctrine was very limited. In meditation sessions that lasted 10, 30, or 45 minutes, held at the start and close of most sessions, and in one mini-retreat, "a day of intensive meditation," the "contemplative experts" sitting on stage made a few suggestions:

> Pay attention to the breath going in and out of your nostrils.
>
> Be aware of any bodily sensations you encounter.
>
> Be open to whatever is going on in this moment.
>
> Notice if your mind is wandering. If it is, gently come back to the breath.

How are these simple efforts supposed to change people and create well-being? According to most contemporary American interpretations of Buddhism, a constant sense of dissatisfaction and a preoccupation with one's own needs lead humans to chase after and cling to things they think will bring them lasting happiness; this restless, habit-bound grasping, followed by constant disappointment, is the cause of suffering. By observing and becoming familiar with recurrent patterns of reaction in thoughts and emotions, the mediator can open a gap which allows for a response to stimulus that is not automatic and conditioned. It then becomes possible to escape the patterns and attachments which cause misery (popular accounts associated with the schools represented at MLSRI include Goldstein and Kornfield, 2001; Hart, 1987; Kabat-Zinn, 1990, 1995, Foreword; Trungpa, 1973).

Yet if we look for models of selfhood among the meditators, we encounter what might be a paradox: the "self" is seen as a tenacious source of suffering but at the same time as merely a conventional reality; Buddhist teachings and meditation aim at loosening the grip of this illusion. Nevertheless, models for how to enact this movement towards the experience of selflessness were provided. Most obviously, the calm smile of the golden Buddha on stage looked out from the back of the stage. In addition, the contemplative teachers offered living examples. With upright posture and traditional Zen robes, Joan Halifax was the stern teacher cutting through delusion with an understated witticism or poetic insight. Jon Kabat-Zinn also quoted poetry; but perhaps because much of his teaching goes to patients with chronic pain and depression, he had an enthusiastic, insistent style. Sharon Salzberg, who teaches insight meditation with a focus on Metta or lovingkindness, appeared almost sublimely unassuming: as one participant said about her, "How can you not let yourself be completely open with someone like that? Someone who has nothing

to prove?" Implicitly, this self-presentation offered a contrast with other panelists who, in more than one sense, had something to prove.

Fruits of Juxtaposition

By bringing two distinct forms of life into contact, the MLSRI makes aspects of each more visible; like ethnomethodological "breach" experiments, taken-for-granted assumptions of both come to light (Garfinkel, 1967; Rajan, 2008 for a comparable study of the interaction of two cultural systems). The double initiation foregrounded psychological habits endemic to high-level science while offering a potentially critical gaze toward outlooks and attitudes associated with meditation. Many participants remarked that, in contrast to their new or renewed contact with meditation, "normal" scientific behaviors appeared at the MLSRI as anxious, aggressive, or downright pathological. One postdoc confided his opinion that the "biggest egos are in cancer research and neuroscience", and spoke about the "incredible suffering" and aggression he saw on the faces of some of the scientists as they spoke. Likewise, one of the faculty members told me that he'd spent the day of meditation noticing "how much survival fear" there is in his activity at conferences, and was beginning to wonder: "Do I really have to jockey to be first author on a paper, like it's life or death?" The contemplative teachers likewise seemed at times to be fending off some of the more harmful effects of the scientific ethos. During instructions, one teacher specifically invited us to cultivate good wishes first to ourselves, then to "someone here who you feel you can relate to," and finally towards "someone here who you fear." When I later asked her about this instruction, she said she'd added it after seeing "how worked up some people are here. They're terrified!"

Reciprocally, scientists could be seen as fending off the effects, or at least some of the less desirable cultural baggage, of meditation. Going back at least to Francis Bacon's criticism of the idols, Western science has relied on various forms of the idea that true knowledge is only possible in the absence of value judgments, cultural or religious biases. Though religious values may have offered a "spur" to science in its early development, the ideology of modern science assumes a clear separation between rational proof and culturally specific beliefs or values. This "deletion of theological interests" was reinforced at MLSRI in scientist's presentations (Latour, 1999). The emphasis on the highest scientific standards may have been a pre-emptive defense against an unspoken accusation that the association with meditation taints science with the brush of mysticism, subjectivism, relativism or new-age credulity.[6]

6 A negative example is research on Transcendental Meditation, where a huge body of findings has been produced in the last twenty years, but where enthusiasm has been seen as leading to exaggerated claims – a fate Mind and Life wants to avoid. No research on TM is presented at the MLSRI.

Repeated phrases and words can crystallize an entire approach to life. Juxtaposition of terms often heard at the conference/retreat highlight differences of attitude and outlook associated with these two modes of approaching the mind:

CONFERENCE	RETREAT
"tractable research questions"	"release the hand of thought"
"rigorous methodologies"	"may all beings live with ease," "gentle yourself"
"a highly leveraged strategy"	"drop in on yourself"
"solid data," "finished products"	"let go"
"progress"	"the present moment"

Given the skewed angles at which these lists meet, we should not be surprised that tensions arose, both internally and externally. As one dramatic example, an advanced grad student and experienced meditator told me a few days into the event:

> I feel like these two sides of myself are getting pulled in opposite directions. I spend half of my time talking to people, building up my ego, where it's all about self-promotion, and the other half of my time on the cushion, trying to do the opposite, trying to reduce my ego.

Other conversations and public discussions brought out related frictions.

A persistent question was about the role of explicitly ethical prescriptions in representations and studies of meditation. Some speakers insisted on meditation's non-sectarian nature, an interpretation promoted by, among others, the Dalai Lama in his recent *The Universe in a Grain of Sand*.[7] The most successful mainstream medical use of meditation – Kabat-Zinn's Mindfulness Based Stress Reduction – does not actively teach ethics, stressing its compatibility with both other religious systems and with science.[8] Instead of "meditation", some spoke of "mental training" or "mental fitness"; the overall focus on attention, cognition, and objective measures of health avoids the religious valence of "enlightenment." Such "tradition-neutral" language may seek to avoid alienating non-Buddhists from meditation – whether

7 This interpretation was advanced at least as early as Suzuki's 1963 *Outlines of Mahayana Buddhism* (see Sharf, 1995: 248). Thanks to Josh Berson for pointing out Sharf's essay and to the persistence of the "Buddhism as scientific religion" trope in philology, linguistics, and religious studies.

8 Instead, Kabat-Zinn told me, the instructors are expected to "embody" morality or *sila*.

adherents of a non-Buddhist religious tradition who fear a conflict with their own faith, or atheists who reject any religious teaching; another reason to downplay "religious" connotations of Buddhism is to remain eligible for public funding sources legally prohibited from supporting explicitly religious organizations.

In fact, a frequent theme among those who have sought to diffuse Buddhism in the West since the 19th century is that Buddhism is not a religion, but rather is closer to a science or even a technology (Lopez, 2008); nevertheless, the "tradition-neutral" approach to meditation, and the attempt to divest it of its metaphysical and ethical dimensions have raised concerns among many involved in Mind and Life. I heard on various occasions a worry that a "neutral" form of meditation – divorced from tradition, and from the ethical prescriptions which form a core component of the eightfold path – might result in "McMeditation" or "Buddhism Lite," just another commodity, part of a consumer culture focused on quick fixes and disposable fashions. Similarly, there was a worry that the findings of Mind and Life researchers might produce usable knowledge about the brain that would make it possible to bypass central aspects of Buddhism. The specter of a "Nirvana pill" – a pharmacological intervention that produced the same states as years of meditation – led some to ask whether there is something intrinsically beneficial about the Buddhist path, said to be very long and incremental. Could a pill which produces the same brain state as a lifetime (or lifetimes) of meditation and right living bring about enlightenment, or is the effort and time of the path indispensable? When "the path is the goal," how should we view technological short-cuts?

Another worry provoked by the "secularization" of meditation is that contemplative practices might be used for unethical ends: for lying better, for manipulation, for overcoming guilt, or for state-sanctioned killing, as in the oft-mentioned case of Zen teachers training Kamikaze pilots in World War II. The role of military origin of a large percentage of neuroscience research cannot be overlooked (Moreno, 2006; Roepstorff et al. 2008); the issue looms even larger in the case of research on meditation, which is traditionally taught as an expression of non-violence, non-aggression, and compassion. Here we are not dealing with speculation. The 2007 Mind and Life meeting was attended by two alternative health instructors for the US Armed Forces, one of whom is an Asian-trained (Caucasian) nun and Army officer; they advertised the potential funds for meditation research available from the Department of Defense. There was some (perhaps surprisingly muffled) discussion about whether neuroscientists sympathetic to the moral aims of Buddhism should place their research in places which will make meditation accessible to ends very different from enlightenment; these debates have continued in the "Meditation List" listserve, while military investment in a wide range of techniques of "mental training," including meditation, has significantly grown in recent years (Carey, 2009). One possibility arising from these discussions was that meditation practices might not actually work (or at least not at full power) without ethics; according to the teachings, certain levels of mental clarity can only be developed in minds

free from worry and guilt. If so, meditation research poses a practical question for mainstream neuroscience: is it possible to study ethics as a kind of medical or technical intervention? What kind of changes in standard research methodologies and assumptions about the relations of the individual to others would be needed to pose tractable questions about the technical efficacy of moral action – or in Buddhist terms, right speech, right effort, and right livelihood?

Ethical Testing

The rift produced by the pub run recounted at the start of this paper suggests that one of the central issues at stake in public discussions at Mind and Life is nothing less than the rules, meaning, and nature of the community itself. Some background, first: On the last night of the first two years meetings, an "official unofficial" party had been held in the gazebo in the woods, with beer and PG-13 hijinks. Though none of the organizers attended, it appeared to have been granted tacit permission, as long as it was quiet and far from the building. In 2006, perhaps in response, an official closing celebration, a "mindful reception" with very limited alcohol, was scheduled for early Friday evening.

The group who left for the local pub that year included many who had attended these earlier parties. The problem, apparently, was not just that they made noise leaving and returning, or that they had created an exclusive group within the group. In his intervention in the hall a day later, Engle emphasized that "the experimental design" of the Research Institute required control of the boundary of the setting, what goes out and what comes in, down to "bringing alcohol back inside your bodies." His request to "refrain from these possibilities" and his advice – "If you see that craving arise, check in with your state of mind and just observe it" – presented the beer run as the result of "craving," the source of all suffering in Buddhist teaching (tanha); to overcome it, he offered the classic meditation technique of observing and letting go.

Two days later, on the final morning, an open conversation was held in the hall: people shared their experiences, expressed gratitude, made suggestions. With a few minutes left, one of the faculty members who had gone to the pub took the mic, apologizing for going against the flow of positive statements, but said he felt (morally) obliged to speak. He "felt Adam's speech … was… a bit preachy, and that the morals of another worldview were being imposed upon us…… I worry about the summer camp mentality: 'better not leave campus, shouldn't drink alcohol, shouldn't eat meat.'" Indeed, he presented the pub visit not as a matter of personal choice but as an imperative of scientific community formation: going out and getting a drink, he said, "is a powerful way to break barriers in our culture," and another senior researcher said, in the hall afterwards, "You can't have it both ways. This group has got to talk." Such comments underline the role often played by alcohol in scientific meetings as an aid to the formation of the special state of dissolved hierarchies that Turner called

communitas. In response to this controversy, the board members on stage further specified the frame. John Dunne, a scholar of ancient Buddhism, referred to the traditional concept Tsang, or Sima, "a border around the retreat that makes it into a separate reality." Dunne apologized that the organizers hadn't informed participants "about our… expectations" – but said they "weren't that clear to us either."

Thus a key feature of MLSRI is the recursive negotiation of its own parameters and definition (for a comparable situation in which the "culture" of the gathering was part of explicity negotiation at the gathering itself, see Helmreich, 2001). Yet this does not mean simply the perpetuation of an amorphous "openness," as a result of such discussions is the clarification of boundaries, an affirmation of certain possibilities and an exclusion of others. Each year has seen the "retreat" aspect increasingly emphasized: periods of silence have increased, language on the website and application emphasizes contemplative training, the "day of serious meditation" now occurs in the middle of the week instead of the end, preventing participants from leaving early.

At the same time, public questioning about how to merge these two ways of life has become more prominent. In 2007, a graduate student took the microphone to note that meditation periods were getting squeezed out by talks over the course of the week:

> Many scientists have the affliction of trying to fit in as much as possible in as little time as possible. But more is not always better. We might be able to use our minds for the first person, too… [and] more frequently direct this lens on ourselves. To see if we're walking our talk.

Pressed by such questions, some speakers explained their views on how to "walk the talk." Halifax distinguished between ambition – science for science's sake or for personal advancement – and aspiration, where one works with the goal of relieving of suffering of other beings. Kabat-Zinn said at the outset that at the summer Institute "even the science will be part of the meditation"; similarly, Davidson said that "scientific method and [meditation] practice are two sides of the same coin… being in the Mind and Life sangha has made clear how important practice is for the science I'm doing," by helping him cultivate honesty, tolerance, humility, and patience – all good scientific virtues. Another possibility was suggested by Alan Wallace, the philosopher, scientist, monk and meditation teacher who played a large role at the meeting in 2005 but was absent in 2006 and 2007. In addition to proposing that Buddhist philosophy and meditation experience might offer corrections to mistaken prejudices of Western science – such as lifting the "taboo of subjectivity" and questioning the assumption of mental "mechanisms" – Wallace also encouraged us to imagine, or be part of, a new generation of "contemplative researchers" with a double training, spending equal time in intensive meditation and on a Ph.D. in neuroscience.

Another model for bridging these two forms of asceticism was offered by Mind and Life's late founder, Francisco Varela. Adam and others repeatedly referred to "Cisco's visionary science" and his example of a "new way of being a scientist." After a showing of *Monte Grande*, a moving film about Varela's life, an audience member asked if after his death there had been a search to find where he had been reincarnated, as is done for Tibetan Lamas. Joan Halifax, whose current work with the dying is informed by her earlier career as an anthropologist, said, "I know Francisco has been reincarnated. In this place, in all of you. In the work you're doing, he's alive. He's become an ancestor."

The "Varela Grants" awarded to promising researchers were thus marked as gifts from the mythological founder, to be repaid by fulfilling and extending the values of the group. As in other cases of ancestor worship, Varela's virtual presence functioned as regulative ideal and moral polestar for the Institute's activities.

Despite tensions, to judge by the personal testimonies, hugs and effusive farewells of the meeting's close, Mind and Life's supersaturated solution is starting to crystallize. When I presented an earlier version of this paper, two audience members whom I had met at Mind and Life spoke up, protesting that I had put too much emphasis on contradictions and tensions; they insisted that a new community is being formed. As one stated, speaking for herself and many she she had met, there is "a new generation, with their feet firmly on the ground in both meditation and research."[9] The continued existence and expansion of Mind and Life suggests the accuracy of her claim.

Variations on the Plastic Self

Studies of the relation between science and identity have often focused on the essentializing tendency of medicalization and geneticization: individuals are fixed and reduced as a diagnosis, a condition, a genetic predisposition. Popular representations of neuroscience undoubtedly tend toward physical reductionism and essentialization, as does, arguably, neuroscience itself. Yet the current preoccupation in neuroscience with plasticity – the possibility of regeneration and change of morphology even in adult brains – suggests that although the equation between brain and self may still obtain, neither biology nor personality is necessarily as fixed as it may have been in the past. At this point, again, Buddhism and neuroscience converge: neuroplasticity ties meditation research to central questions in neuroscience.[10] A source of the appeal of Buddhism in the contemporary West may well be the confirmation it offers for this growing belief in the self as malleable, plastic and transformable. From extreme makeovers to relentless analysis of political candidates's strategies of self-fashioning, the decentered self has become mainstream.

9 Penn Neuroethics Seminar, 28 February 2008.

10 For a useful overview of the concept in neuroscience, Begley (2007); Malabou (2008) suggests that the concept of plasticity allows for a dialogue between neuroscience and philosophy's (or rather "continental" philosophy's) concern with subjectivity and freedom.

Mind and Life is not just a space where science meets a public; it presents itself as a possible site for reforming science. As suggested above, its encounters highlight attitudes and imperatives in the "experimental life" that are otherwise taken for granted. Symmetrically, it emerges as part of an evolving American Buddhism whose developments are radically transforming earlier Asian traditions.[11] Buddhism may also be shifting the broader landscape of religion in US culture. When in his 1918 "Science as a Vocation," Max Weber famously analyzed the "disenchantment of the world" – the modern severance of fact and value, of science and religion – he referred notably to theistic religions. Mind and Life, on the contrary, stresses a non-theistic, indeed an anti-metaphysical or even "positivist" reading of Buddhism suggesting that the truth of its teachings can be confirmed by personal experience and require no leap of faith.

As suggested above, a central issue at stake in Mind and Life is the very status of Buddhism as "religion," its juxtaposition of the American synthesis of diverse teachings and practices traditionally concentrated in Asia with contemporary empirical science brings to the fore a tension that has long been present in the reception of Buddhism in the West.[12] The diverse roles Buddhism plays at Mind and Life and their alignment with those played elsewhere by "religion" in contemporary U.S. culture demand further study. One important line of inquiry would be the religious upbringing and generational dynamics of participants, in order to help make sense of the meaning of Buddhism for these educated, driven, scientifically-minded men and women. If science has been characterized by a "culture of no culture" (Traweek, 1988), Buddhism seems to function, at Mind and Life at least, as both religion and anti-religion. In a global system that has insistently been framed as a "clash of civilizations," part of Buddhism's appeal may be simply that it is not Christianity, Judaism, or Islam; as an exotic, non-theistic, and "empirically-based" religion, it is distinguished from various fundamentalisms and their positions towards other religions, the state, as well as the degree of commitment and class location of their members. We might also see Buddhism working as a sort of "degree zero of religion:" it fills a perceived gap of meaning and order, combining ritual, rational moral guidelines, psychological exploration, and philosophical questioning with an

11 See Sharf (1995) on the way in which Western influence in Japan and Southeast Asia has led to an emphasis on "experience" as the essence of Buddhist practice, producing an individualist, internalist hybrid that Obeyesekere (1970) called "Protestant Buddhism."

12 Lopez (2008). See also Asad (1993), which traces the historical emergence of a Western, Protestant notion of "religion" as one functional domain of life concerned primarily with beliefs and meanings; this conception obscures the way that "religions" differ not merely as systems of belief but as power relations and institutional arrangements. Recalling Nietzsche's interpretation of Schopenhauer, Critchley (2007) diagnoses "American Buddhism" (including yoga and other forms of ascesis) as a form of "passive nihilism," the pursuit of individual development in the absence of collective aspiration. Yet a perspective of the new social forms involved in the spread of meditation suggests ways they challenge not only dominant belief systems but conceptions of the social and of political action: see Queen (2000).

implicit critique of received traditions. In the neuroscience of meditation, an exotic, and yet "empirical" and "rational" system which denies the existence of the soul may, paradoxically, appear as a way to bring back a soul to a disenchanted science.

Superimposed within Mind and Life's mobile frame are two faces of the plastic, modifiable self – one rooted in neuroscience, one grounded in a much older set of practices and metaphysical systems. Despite physiognomical resemblances, however, the various schools of neuroscience and Buddhism offer quite distinct propositions about the nature of physical reality, the power of the mind, and the right way to live. In the experiments that are bringing these forms of life together, both are transformed and redefined. The same is true of their participants, who, by occupying both of these world, make themselves into open sites of investigation: they establish themselves as scientists, even as they work to dissolve attachment to their "selves."