

dressed it as if it were a microphone. Each photograph captures the dignity of those living face-to-face with war, famine and poverty. The children are the most memorable. Individual expressions are enhanced by the story Salgado tells about how he came to take their pictures. The children, he explains, were fascinated by this white man toting a Leica. Invariably they would come up to him, wanting attention, wanting to see the camera, wanting him to take a picture. Finally he told them that he would take a picture of each of them if they would let him get on with his work. This resulted in the book called *The Children: Refugees and Migrants*. As Berger declares, each seems to say “I exist,” while also managing to introduce a unique individual to those of us who now see them from afar.

It is tempting to say that the video, with its music and editing, loses something due to the way the “script” influences how we see the work. Similarly, it is tempting to say that the printed publication allows one to appreciate the artistry of the images, the complexity of the compositions and Salgado’s uncanny ability to make the people real. Both of these comments, while holding a partial truth, would fail to convey how effective Salgado’s work is in whatever form is used to present it. Anyone who cares about the state of our world and the populations that have not benefited from globalization definitely needs to engage with Salgado’s photographs. The video is an excellent introduction to both *Migrations* and *The Children* series. It would be particularly effective in a cultural studies classroom, given the way Berger’s comments, as well as Salgado’s explanations, expand the story the pictures tell. *The Spectre of Hope* visually conveys how technology, industry and a global economy have transformed people’s lives, often making life harder. Still, the video does not provide the kind of silence and prolonged viewing that the books offer. Leafing through the books, one can spend more time with each picture and read the commentary Salgado includes as well. The words explain who or what we see, adding some dimension to each image and situation.

Overall, Sebastião Salgado’s photographs help us re-think how we live and coexist in a global society. His photo-journalistic images reach far beyond the sensationalism of television and other forms of mass media. Finally, *The Spectre of Hope*, *Migrations* and *The Chil-*

dren: Refugees and Migrants remind us of the degree to which photography and video have altered the way we communicate about our world. Prior to the invention of the camera, these kinds of images could only be rendered using words or, perhaps, line drawings. As a result, the circumstances of normal people were usually not exposed. Line drawings took time, and only a major event would be recorded in a painting. Now our tools allow us to see more, exposing invisible populations to a greater degree. The video and the book collections introduce us to global migration, and each impels the viewer to add his or her hope to the hope we see in the many faces Salgado brings into our lives.

BOOKS

FROM ENERGY TO INFORMATION: REPRESENTATION IN SCIENCE AND TECHNOLOGY, ART, AND LITERATURE

edited by Bruce Clarke and Linda Dalrymple Henderson. Stanford Univ. Press, Stanford, CA, U.S.A., 2002. 364 pp., illus. ISBN 0-8047-4176-1.

Reviewed by Robert Pepperell, *Polar (Posthuman Laboratory for Arts Research)*. E-mail: <pepperell@ntlworld.com>.

From Energy to Information is an avowedly interdisciplinary project both in subject matter and in construction. The introduction states: “The differences among the practices of scientists, artists, writers, and engineers may be seen not as fundamental disciplinary barriers but as a matter of local variations due to divergent representational goals” (p. 14). What results is a collection of essays that seeks to chart the complex interactions between different kinds of representation in the arts and science, proposing as its binding thesis a general shift in recent history from an essentially thermodynamic understanding of nature to an essentially in-formatic one. The book itself originates in a 1997 symposium of the same title at the University of Texas and claims to be the first to deploy so diverse a range of scholars in such a tightly focused way in this field of inquiry.

In his introductory essay, co-editor Bruce Clarke sets out a chronology of

what he calls “the historical movement from energy to information regimes” (p. 33). He explains how we arrived at our modern notion of energy, how it was integral to the growth of 19th-century science and industry, and how it was represented in the popular and literary imagination, most notably in the widely disseminated idea of the impending “heat death of the universe.” The capacity of ordered energy to do useful work, and hence drive human progress, was coupled with an inevitable tendency toward dissipation, disorder and decay—the entropic underbelly of energetic vitality. This dualism found resonance in mid-20th-century theories of information, particularly in attempts to ensure the integrity of useful data and avoid the loss of signal in dissipative noise. By the end of the last century, according to Clarke, the transition was complete, and information entered a transcendent, autonomous phase—for some becoming virtually detached from any material base and almost the very condition of posthuman existence.

The book then proceeds to interrogate the central thesis from a number of theoretical standpoints. Norbert Wise, for example, proffers the idea that 19th-century thermodynamics radically altered the prevailing conception of time. Prior to the emergence of energetic theories, the temporal dimension was regarded as essentially circular and permanent—like ideal planetary motion—and, in keeping with its feminine designation, symbolized by cycles of rebirth and regeneration. As the transformative power of energy and the irreversibility of entropic decay was revealed, however, time took on a linear dimension that was represented as masculine and progressive, or potentially destructive. Wise points out how this gender-based demarcation of time was played out in the social theory of industrial capitalism, themes that are developed in Bruce Clarke’s essay “Dark Star Crashes,” which examines the imaginative treatment of universal heat death in Camille Flammarion’s *La Fin du Monde*.

In an essay entitled “Energetic Abstraction,” Charlotte Douglas traces the brief span of the Russian revolutionary avant-garde, and in particular the decisive influence of the energy-centered theories of both Wilhelm Ostwald and Alexander Bogdanov. This is an outstanding piece of work—ideas are lucidly expressed, research is effortlessly presented, and it illuminates a

whole period of art that I had always imagined as being embroiled in turgid political idealism. Ostwald, a prodigious chemist, propagated a monistic worldview based on the fundamentally energetic constitution of nature: “Everything that happens in the world,” he maintained, “is nothing but a change in energy” (p. 77). His work profoundly affected the psychologist Bogdanov, who, through the Proletkult workers’ educational network that he established, spread radical theories of art and creativity to serve a progressive social purpose. Bogdanov’s fluid and dynamic conception of universal energetic change brought him into conflict with Lenin’s stiff materialism, and he was denounced. But Bogdanov’s ideas were to promote a vital rush of creative activity in which artists sought in various ways to capture or depict energetic change.

In “Lines of Force,” Bruce Hunt gives an engrossing account of late-Victorian attempts to model—quite literally using brass wheels and elastic bands—the evanescent ether then thought to pervade physical reality. In doing so he reminds us of the risks of allowing theoretical models of reality to stand in for the reality itself and hence confusing analogy with explanation. The employment of analogy in the absence of explanation is central to Ian F.A. Bell’s essay on “The Real and the Ethereal.” Commenting on the modernist verse of T.S. Eliot and Ezra Pound, Bell considers the limits of analogy in literature and science, especially when used to visualize something like an imponderable “Aether.” At the same time he recognizes the creative potential of analogy, which “depended upon a yoking together of conceptual dissimilarity and relational agreement, laying the ground for revised notions of difference that could be both objectively and speculatively exploratory” (p. 121).

In her key essay, co-editor Linda Henderson proposes the notion of “Vibratory Modernism” to describe those works of early modernist art that were imbued with contemporary scientific theories of waves, x-rays, wireless telegraphy and ether. Works by Boccioni, Kupka and Duchamp are examined in the light of both the artists’ own comments and popular theories of matter, space and energy. The resulting confluence of science, art and occultism represents a deliberate attempt on the part of some artists to render the ethereal into the aesthetic domain.

The materialization of fleeting energetic impulses was also being undertaken in the scientific domain, with the development of various devices of inscription that turned energetic fluctuations into permanent graphical traces. A rather beautiful essay by Robert M. Brain acts as a kind of pivot for the whole argument of the book. By tipping us from the inscriptive devices of the 19th century to the servo-mechanisms of mid-20th-century analog computers, Brain identifies a continuity between two strands of technical development that often seem dissected by the Second World War. The subsequent digitization of information, despite its economies of storage and reliability of transmission, took many years to match the direct-drive efficiency of analog calculators such as William Thompson’s tide predictor or Vannevar Bush’s differential analyzer. Closing the section of the book dealing with the graphical inscription of energy, Christoph Asendorf describes in his essay “Bodies in Force Fields” how a theory of biological membranes was invoked by Paul Klee and several Bauhaus students to reconcile conflicting energetic pressures in social life, art and architecture.

As the focus of the book then shifts to informatics, N. Katherine Hayles uses an analysis of three literary works to critique the currently popular notion of an imaginary “free information”: “thereby puncturing the dream of an informational realm that can escape the constraints of scarcity” (p. 254). The origin of this (literal) debasement of information is often traced to the enthusiasm for cybernetic ideas in the latter 20th century, where information came to be seen as autonomous and self-liberating. The post-war emergence of cybernetic theory and its application in the design of human-machine interaction is the background for Edward A. Shanken’s account of Roy Ascott’s engagement with systems and feedback in the experimental art he produced in the 1960s. In Ascott’s “cybernetic vision,” art is less a repository of information than an “intelligence amplifier” (p. 275), working through and between organic and mechanical processes to increase human creativity. In his contribution Marcos Novak describes his vision of “eversion” as “a casting outward of the virtual into the space of everyday experience” (p. 311). Novak’s essay is a glittering evocation of sensory space—a void filled with reactive sensor units, or sensels, which link the user’s actions

with invisible computational data. Just as Michael Faraday had speculated on a void filled with electromagnetic waves of energy, so Novak’s everted space is a fog of information, that ultimately is about “puncturing the barrier of computer screens as we know them and letting virtuality pour out and saturate newspace . . . Eversion brings reality to sunlight” (p. 323).

Despite the enthusiasm that this book embodies and will, it is hoped, generate, one is left with some uneasiness about the symmetry of the narrative on which it is based. It is easy to forget that the “Age of Steam” was also the age of the telegraph, and by the mid-19th century had seen the laying of transatlantic cable. With the rise of mass literacy and cheap publishing, information was already a ubiquitous commodity, and it seems likely this would have had some impact on literature, if not visual art. At the other end of the story, the post-war period was marked not only by a growth in informatic theory but also by the massive cultural impact of the “nuclear age,” promising an unthinkable excess of energy. Although this impact is played down by W.J.T. Mitchell (“it was really only a quantitative extension of the age of energy” [p. 362]) it arguably had as great an effect, if not a greater, on the global psyche during this period than the processing of data. Thus, the historical transition from energy to information is perhaps not as orderly and comprehensible as many of the contributions would suggest. Moreover, one might be left with the impression that the age of energy is somehow over, whereas in fact the current enthusiasm for permissive social intercourse conducted in data-space may be reaching its zenith just as its very promiscuity debases its exchange-value. In which case we might turn away from the distractions of easy information toward an appreciation of our embodied nature, which after all is the ultimate source of all energetic experience.

There are a couple of other tendencies that should be noted, not least the impression given of a sort of scientific determinism in which artists and writers are engaged in a game of “catch up,” trying to give expression to the advanced speculations of the laboratory. While there is little doubt, especially from the prodigious evidence presented here, that this is often what happens, the influence of literary and artistic ideas on scientists and theorists would benefit from being given greater

weight. It would also have been worth pointing out that despite their intimate connections, energy and information are also essentially different insofar as energy can be nothing other than itself, while information as a signifier is always something other than its energetic self.

In the current intellectual atmosphere one can be almost suffocated by the excess of theory devoted to digitality, information, virtuality and cybridization. Any wide-ranging and imaginative consideration given to the cultural economy of energy, by contrast, is extremely rare (and in this respect the book is worth getting for the references alone). Those of us who have been taken to task for deploying the concept of energy outside the domain of science or engineering will strongly welcome this thoroughly researched and, by and large, clearly written anthology. I suspect that it is as an early and vivid contribution to the emerging field of cultural thermodynamics that *From Energy to Information* will leave its trace.

THE DELEUZE CONNECTIONS

by John Rajchman. MIT Press, Cambridge, MA, U.S.A., 2000. 167 pp. ISBN: 0-262-18205-X; 0-262-68120-X.

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This book was published 2 years ago, and this review is late indeed. There is no risk, however, that the book or its subject will lose its urgency very soon. It presents the work of Gilles Deleuze, a philosopher who is generally considered to be very difficult to read and understand. But maybe the difficulties are to a great extent related to some people's inability to grasp more than a few levels or trails of thought at the same time. Deleuze's thinking is, as Rajchman writes, "unlikely to work for those minds that are already settled, already classified." What it is all about is, essentially, an openness that permits connections to be made between fields of experience that are, on the whole, held apart in academic quarters. Deleuze always searched for connections between discursive and pre-discursive levels, between sensation and cognition. Thinking was, for him, to experience life in its sensual multitude and to connect it to the history of abstract thought.

Some of his and his friend Felix Guattari's fantastic metaphors, such as "bodies without organs," "rhizomatic activity" and "desiring machines," have commonly and easily been turned into popular and simplistic slogans of technological determinism. Therefore it is often necessary to point out that a body without organs is not necessarily a robot, that a rhizome is not necessarily an electronic network and that the notion of an "abstract machine" does not have to imply the presence of a machine in the literal, material sense. In Deleuze's thinking, there is indeed very little support for the notion of the brain as some kind of computer. And that is only one of the many reasons why Rajchman's book fulfills an urgent need for clarification and explanation.

Rajchman has chosen to divide the book into six chapters, each reflecting a central aspect of Deleuze's thought. In the first chapter, called "Connections," Rajchman briefly summarizes Deleuze's re-reading of the history of Western thought. He puts forward the notion of connective, experimental thought as being the essential trait of this re-reading. The arguments are further elaborated in the following chapters, called "Experimentation" and "Thought." In the chapter "Multiplicity," he successfully clarifies Deleuze's inquiry into levels of complexity in nature and in thought, i.e. into things that are not reducible to schemes or binary oppositions. The significance of this thinking in relation to the social and aesthetic spheres is exemplified in the concluding chapters, "Life" and "Sensation."

As an easily accessible introduction to a big and labyrinthine body of work, Rajchman's book is most useful. It is less rewarding if one looks for a more critical evaluation of Deleuze's work in epistemological, political and semiotic terms. Such evaluations would, however, be the task of a great number of large-scale, specialized studies.

PARABLES FOR THE VIRTUAL: MOVEMENT, AFFECT, SENSATION

by Brian Massumi. Duke Univ. Press, Durham, NC, U.S.A., and London, U.K., 2002. 328 pp. ISBN: 0-8223-2882-8; 0-8223-2897-6.

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Drifting through (and I recommend drifting rather than focusing intently—

it makes for a more productive read) Brian Massumi's *Parables for the Virtual: Movement, Affect, Sensation*, I became excited by finding a new voice that has great potential for cinema studies (my own area of research) and theoretical discourses in the humanities in general. This is not an easy read, but it is a challenging one that forces the reader to think actively about the usefulness of interpretive language. Massumi presents the reader with a flexible, malleable approach that invites a multifarious and creative method of interpretation. Shunning the "paradigm" approach that has haunted cinema and cultural studies, he instead outlines more inventive possibilities that do not fix the critical thinker/writer in her interpretation of the cinema and its audience—or culture and its cultural products.

The aim of the book, states Massumi, is to consider the body and its capacity for movement and sensation in writings of cultural theory. Additionally, the state of affect is a crucial one. "There seems to be a growing feeling within media, literary, and art theory that affect is central to an understanding of our information—and image-based late capitalist culture." Affect is integral to postmodernism, yet the problem, as Massumi so rightly explains, is that "there is no cultural-theoretical vocabulary specific to affect" (p. 27). Influenced by the work of Gilles Deleuze, he sets himself the task of exploring the possibility that movement, affect and sensation "might be culturally-theoretically thinkable" (p. 4). Rather than seeking to be oppositional to traditions of post-structuralism and cultural studies, he intends, instead, to build on this body of work by also traveling theoretical and critical journeys in new directions that, above all, consider affect and the corporeal in their analysis.

Massumi's concern reflects the frustration of many academics in the humanities. We have inherited theoretical models that are stubborn, single-minded and monolithic in their attitude, often tending to homogenize the object of their study. Owing a great deal to the model of semiotics emerging in the 1960s and 1970s (via interpretations of Ferdinand Saussure's writings), the theoretical paradigms that followed—whether structuralist, psychoanalytic, feminist, ideological and so on—highlighted the mechanism of "mediation." "These were ideological apparatuses that structured the dumb material interactions of things and