

Sabine E. Wildevuur

Invisible Vision: Could Science Learn from the Arts

Bohn Stafleu Van Loghum, Uitgever, NL,

2009

Reviewed by Stephen Wilson

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Invisible Vision: Could Science Learn from the Arts is an intriguing book that will be of interest to many *Leonardo* readers. It was written by Sabine E. Wildevuur. She is programme manager/ Healthcare at Waag Society in Amsterdam. (For readers who might not be familiar, the Waag Society is a Dutch cross disciplinary organization that "develops creative technology for social innovation" and "acts as an intermediate between the arts, science and the media.")

Wildevuur's question "Could Science Learn from the Arts" is a critical question relevant to the intersections of art, science, and technology. There have been many articles and books written in the last few years on the intersections. Also many organizations, festivals, and arrangements to encourage collaboration have been set up. Artists have leapt to create unprecedented new works inspired by research. The enthusiasm is building. Most of it is based on the faith that a techno-cultural society will be enriched by the arts and sciences engaging each other in many ways.

Most of this work, however, focuses on how the arts are enriched. By attending to the research world, artists are working with areas of inquiry of great importance to

the society. They are bringing new concepts and technologies into the art arena. However, according to the artists, theoreticians, and policy makers encouraging this work, not only the arts will be enriched. They claim that the research community also be augmented by being introduced to new research agendas, research processes, visualization methods, interpretations, and frameworks for analyzing and communicating research.

The claim is intriguing and makes good sense. Yet there is significant asymmetry in this corpus of work. There is much less evidence and analysis about the impact on the sciences. Wildevuur's book is a strong first step in this analysis. Concentrating on medical imaging, which is key to both science and art, she presents an impressive body of material to bear on the questions.

She offers chapters on "Making the Invisible Visible: The Gallery of Medical Imaging;" "WYSIWIG (What you See is What You Get)?" "Visualization and Data Beautification;" "From the 'Art' of Medicine to Art in Medicine;" and "Imaging and Imagination of Science: A New Perspective." The book is richly illustrated with historical and contemporary images drawing both from art and science. She has done a marvelous job of locating provocative images to further her analysis.

A few examples will illustrate her approach. In the first chapter she develops the idea that art making was intrinsic to the scientific enterprise in the early days of Western medicine/biology. Scientists could not proceed without careful drawings and models of what they were seeing as they peered inside of bodies. Artistic craft and vision were essential to furthering the research. The objects created not only accurately documented observations but also generated great excitement that motivated scientists and also raised new questions that became part of the engine of science. The "Gallery of Medical Imaging" is an exceptional resource for those studying these topics.

In the "WYSIWIG" chapter she explores the idea that contemporary medical research imaging tools such as MRI and PET scans can not create purely 'objective' images. For example, the phenomena being scanned often do not have any specific colorization associated with them in nature. An MRI returns data about the intensity of the spin of hydrogen atoms. It is up to the scientists and designers of the devices to decide how to map colors to data. Different mappings emphasize different features of the data. Wildevuur explores the contribution an artistic sense can add to maximizing researchers' abilities to learn from their data.

The chapter "Imaging and Imagination of Science: A New Perspective" investigates new media technologies being adapted to research-immersive virtual reality and interactive gaming. For example, immersive VR is seen as opening

unprecedented new ways to understand research data. The viewer wears stereoscopic head tracking goggles and 3D headphones such that they can move through and manipulate a high-fidelity representation of a 3D virtual data world. They can explore data elements from all angles like they were objects floating in space. In the VR environment, worlds that are too small, too big, or too abstract are rendered like familiar physical objects. Wildevuur notes that this way of approaching data does not just make it visually clearer; it actually may add new conceptual dimensions for conducting the research. She poses this work with experimental media as a place the arts can teach the sciences.

The book is a great resource both for its ideas and visuals. It will add significantly to needed analysis. It should be noted, however, that it is not a comprehensive answer to the questions. It is lacking much direct testimonial of scientists whose felt their research had been augmented by art. Also, its focus on visualization means it does not have much to say about some of the other ways artists think they might contribute to science - for example, identification of new research agendas, development of technologies outside of commerce, and working with non visual aspects of science. While we can enjoy this book, we must recognize that there is still much work to be done.



Neuroaesthetics

Edited by Martin Skov and Oshin Vartanian

Foundations and Frontiers of Aesthetics Series, Series Editors: Colin Martindale and Arnold Berleant

Baywood Publishing Co.
2009

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<http://www.baywood.com/intro/336-9.pdf>

IN PRAISE OF

"*Neuroaesthetics* is the most comprehensive picture currently available of a new and rapidly expanding field, bridging the obvious gap between biology and aesthetics by integrating knowledge from multiple disciplines. This book sets the agenda for the consolidation of neuroaesthetics as a fundamental field of inquiry for the 21st century. *Neuroaesthetics* will be a must on the shelves of all scholars interested in the creation

and appreciation of art and aesthetics."

—Francisco J. Ayala, University Professor and Donald Bren Professor of Biological Sciences, University of California, Irvine, Author, *Human Evolution: Trails from the Past*, Recipient, U.S. National Medal of Science, 2001

"Skov and Vartanian have assembled an impressive volume on the rapidly burgeoning field of neuroaesthetics. The contributions cover a broad range of topics—from visual art to music, patient studies to neuroimaging approaches—while providing an exhaustive and deeply considered treatment of each. Being a relatively young field, neuroaesthetic research consists of a manageable body of knowledge surrounded by a vast and compelling array of questions. This book provides readers with a detailed map of the available research findings and sketches out the promising unknown territories in a way that is certain to fascinate and excite."

—Raymond A. Mar, Ph.D., Assistant Professor, Department of Psychology, York University, Toronto

"The field of neuroaesthetics, viewed broadly, is the application of neuroscience to problems in the psychology of art and aesthetics. This definition alone implies that not many people study neuroaesthetics, so the chapters assembled by Martin Skov and Oshin Vartanian, the volume's editors, are all the more impressive—it looks like most of the world's neuroaestheticians provided a chapter. *Neuroaesthetics* is part of Baywood's *Foundations and Frontiers in Aesthetics* book series, and the prior series volume, *Evolutionary and Neurocognitive Approaches to Aesthetics, Creativity, and the Arts* (Martindale, Locher, & Petrov, 2007; for a review, see Silvia, 2007), is an informal companion volume. Collectively, the two books cover most of what psychology knows about the biological side (broadly defined) of the arts.

Like most edited books, *Neuroaesthetics* provides a mix of history, theory, research reviews, and applications. For the most part, it's theoretical and speculative—its aim is to shape and motivate future research, and the book meets this aim well. Readers will come away believing that neuroscience affords enormous opportunities for furthering our understanding of aesthetic problems.

Edited books are underrated as a way of bringing attention to hard problems that deserve more attention, and I think *Neuroaesthetics* could be remembered as a turning point in the psychology of art. *Neuroaesthetics* is a good read for researchers with a passion for such things."

—Paul J. Silvia, *PsycCRITIQUES*, November 25, 2009, Vol. 54, Release 47, Article 5

ABOUT THE BOOK

The beginning of psychological aesthetics is normally traced back to the publication of Gustav Theodor Fechner's seminal book *Vorschule der Ästhetik* in 1876. Following in the footsteps of this rich tradition, editors Martin Skov and Oshin Vartanian view *neuroaesthetics*—the emerging field of inquiry concerned with uncovering the ways in which aesthetic behavior is caused by brain processes—as a natural extension of Fechner's "empirical spirit" to understand the link between the objective and subjective worlds inherent in aesthetic experience. The editors had two specific aims for this book. The first was to highlight the diversity of approaches that are underway under the banner of neuroaesthetics.

Currently, this topic is being investigated from experimental, evolutionary, neuropsychological, and neuroimaging perspectives to tackle problems in the visual arts, literature, music, and film. Its quintessentially interdisciplinary nature has functioned as a breeding ground for generating and testing hypotheses in multiple domains. The second goal was more integrative and involved distilling some of the key features common to these diverse strands of work. The book presents a possible framework for neuroaesthetics by highlighting what the contributors consider to be its defining features and offering a working definition of neuroaesthetics that captures these features. *Neuroaesthetics* will provide an empirical and theoretical framework to motivate further work in this area. Ultimately, the hope is that puzzles in aesthetics can be solved through insights from biology, but that the contribution can be truly bidirectional.

Intended Audience: Psychologists, philosophers, neuroscientists, and practitioners of art interested in the biological underpinnings of aesthetic behavior. The book will be of interest to professionals as well as graduate students.

ABOUT THE AUTHOR

Martin Skov was trained in linguistics and literary theory before pursuing a Ph.D. in neuroscience, using functional MRI (fMRI) to investigate the neurobiological underpinnings of aesthetic preference formation. He is currently a research fellow at The Danish Research Centre for Magnetic Resonance at the Copenhagen University Hospital Hvidovre. He is a coeditor of several books, in Danish and English, and, together with a colleague, is writing a book on the relation between preference formation and decision-making.

Oshin Vartanian received his Ph.D. in experimental psychology at the University of Maine, with Dr. Colin Martindale as his supervisor. He completed a postdoctoral fellowship in cognitive neuroscience under the supervision of Dr. Vinod Goel at York University, in Toronto, and a visiting fellowship under the supervision of Dr. David R. Mandel at DRDC Toronto, where he is currently a Defence Scientist. He studies the neural underpinnings of higher cognitive function, including creativity, reasoning, and decision making, as well as the neural bases of preference formation and aesthetics.

Durant l'été 2011 deux ensembles d'articles sur la neuroesthétique ont été publiés.

[**nonsite.org**](http://nonsite.org)

Issue #2: Evaluating Neuroaesthetics

By [nonsite](http://nonsite.org)

In a special dossier, contributors present claims for and against neuro-, cognitive, and evolutionary aesthetics. Edited by Todd Cronan.

issue #2 (Summer 2011)

Table of Contents

Articles

Neurovisuality

By [Whitney Davis](http://nonsite.org), University of California, Berkeley

Responses to Davis, “Neurovisuality”

By [Charles Palermo](#), College of William & Mary and [Whitney Davis](#), University of California, Berkeley

Fiction: A Dialogue

By [Blakey Vermeule](#), Stanford University

Two Problems with a Neuroaesthetic Theory of Interpretation

By [Jennifer Ashton](#), UIC

Response to Ashton, “Two Problems”

By [Blakey Vermeule](#), Stanford University

Carl Einstein, Daniel-Henry Kahnweiler, Cubism, and the Visual Brain

By [Charles W. Haxthausen](#), Williams College

Music, Image Schemata and “The Hidden Art”

By [Brian Kane](#), Yale University

American Society for Aesthetics Newsletter

<http://www.aesthetics-online.org/newsletter/31.2.pdf>

⑧

David Edwards

Artscience: Creativity in the Post-Google Generation

Harvard University Press,

2009

“*ArtScience* champions the virtues of interdisciplinary work. Using captivating anecdotes of how both disciplines can enhance each other **Edwards** offers one of the strongest and most original contributions to the literature on creativity.”—**William S. Hammack,**

**Commentator for
National Public
Radio's
Marketplace, and
Professor,
Department of
Chemical &
Biomolecular
Engineering,
University of
Illinois at Urbana
Champaign**

“The tenor of this convivial, onrushing book makes one think that what the best workers in both fields have in common is what this book consistently offers: a great and moving intellectual generosity.”—**Jay Cantor**

“**Edwards**’ book is something of a manifesto for artscience, and for the need to cultivate more porous

cultural, corporate and educational institutions...Arguing passionately for the need for new collaborations between scientists, artists, industry and the social sector, *Artscience: Creativity in the Post-Google Generation* is ultimately a collection of enticing tales from the trenches for would-be practitioners.”—

Michael John Gorman, Irish Times

“[*Artscience*] is less a technical tool than a motivational one: an exhortation for interdisciplinary intellectuals...**Edwards** infects us with his subjects’ creativity. When the final chapter turns from vignettes to

his utopian Laboratoire, we're rooting for it to succeed.”—**Alice W. Flaherty**, *Nature*

“**Edwards** attempts in this truly inspiring work to shed light on the perceived dichotomy between the arts and sciences and why it needs to be challenged. He looks closely at the idea of translating concepts or ideas through pure sciences and the arts as they occur in all sectors of life. Essentially, he shows how scientific ideas flourish in the artistic community and how art can inspire science. **Edwards** takes interdisciplinary thinking to another

level, going a long way in demonstrating a kind of symbiosis that can--and for many, does--exist between the arts and sciences. He relates stories of 'artscience' innovation in France, Germany, and the United States; discusses his recent founding of Le Laboratoire, an artscience cultural center in Paris; and explains the theory behind his idea of the "laboratory."”—

Michael McArthur, *Library Journal*

“There are scientists, and there are artists. Now, there are art scientists. In his new book, *Artscience: Creativity in the Post-Google Generation*, **David Edwards** explains how this group of thinkers melds the two disciplines in innovative ways to make lasting and important breakthroughs for the betterment of humanity, culture, academia, and industry.”—**V. L. Hendrickson**, *New York Sun*

“In his concise book, **Edwards**, a professor of biomedical engineering at Harvard, shares the stories of people who have found ways to cross this

barrier [between art and science]-- artscientists, he calls them--and elegantly communicates the catalytic effect of their interdisciplinary leaps.”—**Daniella Maestretti, *Utne Reader***



Jeannine Yon-Kahn

Rencontre de la science et de l'art – L'architecture moléculaire du vivant

EDP SCIENCES. Grenoble

2010

Jeannine Yon-Kahn fait partager son admiration des structures moléculaires et des édifices supramoléculaires comme le

sentiment de beauté et d'harmonie qu'ils suscitent.

Elle souligne des liens entre leurs formes, qui reposent sur des lois physiques, et celles créées par l'homme en architecture et dans la décoration. Elle suggère aussi que l'esthétique n'est pas étrangère au processus de découverte chez les scientifiques. Le lecteur vivra ainsi les étapes de découvertes majeures concernant les ADN, les protéines. Il redécouvrira le nombre d'or et son apparition dans des contextes différents.

La réflexion entre recherche de la réalité et recherche de la beauté est étayée par quelques ponts vers les œuvres de philosophes et de scientifiques. Chacun s'approprie cette réflexion sur le lien entre Art et Science, entre création des hommes et structure moléculaire du monde vivant. L'ouvrage est destiné à un public non spécialisé, curieux de la structure intime du monde vivant. Le parallèle entre Science et Art concerne tout "honnête homme" mais aussi les étudiants, enseignants et chercheurs (philosophes, scientifiques, épistémologues, historiens, architectes, plasticiens, designers...).



Harry Francis Mallgrave

The Architects Brain: Neuroscience, Creativity, and Architecture

Oxford: Wiley-Blackwell,

2010

"The Architect's Brain: Neuroscience, Creativity, and Architecture" is the first book to consider the relationship between the neurosciences and architecture, offering a compelling and provocative study in the field of architectural theory. Explores various moments of architectural thought over the last 500 years as a cognitive manifestation of philosophical, psychological, and physiological theory. Looks at architectural thought through the lens of the remarkable insights of contemporary neuroscience, particularly as they have advanced within the last decade. Demonstrates the neurological justification for some very timeless architectural ideas, from the multisensory nature of the architectural experience to the essential relationship of ambiguity and metaphor to creative thinking.



Michel Meulders

Helmholtz: From Enlightenment to Neu

edited and translated by Laurence Gare

The MIT Press, Cambridge, MA,

2010

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A recurring topic among those interested in art, science, and technology is approaches. In my view, those who gravitate to this area (or related areas multidisciplinary, and integrative studies) see broad-based thinking both innovatively address some of the complex issues of our world today. And value disciplinary boundaries and believe that those who can operationally have the best foundation for conceptualizing how to innovate and see beyond tendency to cast Leonardo da Vinci in the role of the “historical archetyp

“Renaissance Man,” has perhaps allowed us to lose sight of the many others who exemplify what creative minds can accomplish when paired with a far-ranging imagination.

Helmholtz: From Enlightenment to Neuroscience by Michel Meulders offers a good opportunity to identify a number of figures in the past who worked across disciplines. The book focuses on Hermann von Helmholtz (1821–1894), trained by Johannes Müller, and one of the most outstanding physiologists of his time. A key nineteenth century polymath, Helmholtz made significant contributions to the co-discovery of the principle of the conservation of energy, his invention of the ophthalmoscope, the ophthalmometer and the telestereoscope), and his major contributions to physiology, physics, physical theory, philosophy of science and mathematics.

How Helmholtz brought his varied interests and education into his labora through the book. We learn that during his formative years he was expos influenced by his father, a German teacher who cultivated an interest in s Hermann was strongly attracted to the natural sciences, his father urged h funding for medical education was available. After training in physiolog areas outside of medicine over the years. Indeed, a defining feature of He branched out in many fields as he sought to translate his biological insight mathematical framework. In this, he was aided by his keen observational experimentation.

I began this book expecting a biography that would offer a chronology of contextual material to help the reader place his work within the nineteenth instead offers a quite variegated picture that made it somewhat difficult for me as I read. The challenge in ferreting out Helmholtz' story was due to the included that contextualizes Helmholtz in terms of the people and ideas that he influenced. The chapter on "Goethe and His Vision of Nature" is 13 pages and does not end with Helmholtz' views of color, which is discussed eight pages into the next chapter. Long "asides" such as this make it difficult to understand what the author wanted the reader to take away. It is clear that the author has great enthusiasm for the accomplishments of Helmholtz. In addition to the Goethe chapter, there are chapters on "Johannes Müller: "Man of Iron" and "Hermann von Helmholtz: "Man of Science".

Alexander von Humboldt.” It is hard to say if this format was intentional or if the chapters were originally written as stand-alone articles and were later pieced together into this book.

The strongest chapters are the two that cover Helmholtz’ work on hearing and perception. The first chapter covers Helmholtz’ work on hearing and the second chapter that summarizes Helmholtz’s theory of visual perception. Helmholtz’ *Sensations of Tone as a Physiological Basis for the Theory of Music* says that Helmholtz’ work on hearing and perception were originally written as stand-alone articles and were later pieced together into this book. The author explains that Helmholtz’s early musical activities throughout his life provided a foundation as well as a motivation for his scientific work on hearing and perception. We also learn that this scientist invented the “Helmholtz resonance” to explain how different frequencies or “tones” present in musical chords and other sounds contain different overtones. The “Helmholtz resonance” was among the instruments Helmholtz studied. His attraction to this instrument was likely due to the fact that it approached his work overall. Helmholtz was drawn to the bell because it is a simple instrument that requires a specific thickness to produce a specific tone. One needs to obtain an equal thickness around the whole circumference. If the thickness is not uniform, the bell will not produce a specific tone. In different places, there is a spot on the edge of the bell that vibrates to give a specific tone. If a neighboring spot produces a different tone and the intermediate zone between them vibrates, the two tones will be heard at the same time. Helmholtz wanted to understand the unpleasant dissonance of bells and how it is produced. Ultimately, he demonstrated that difference and combination (or sum) tones are the source of dissonance and consonance that we hear with our ears. (Although, ironically, bells are characterized by anharmonic relationships, they still sound good.)

Another disappointment with the presentation was that the captions for a number of the images were too brief and too abbreviated. Many basically said what the image is and provided very little information about how the depicted equipment (or whatever) works. Because this was not always the case, I was disappointed that the chapter on music where the captions were full-bodied descriptions, the captions for the other chapters were originally written as stand-alone articles.

All in all, once I adjusted to the book “as a collage” and absorbed it on its own terms, it was a very informative read. It developed Helmholtz sufficiently to send me looking for more information. As I continued to read further, I realized that all the basics were covered. It was only because the chapters were originally written as stand-alone articles that it was harder for me to see the geography, so to speak.

Finally, based on the title of the book, *Helmholtz: From Enlightenment to Neuroscience*, one might expect to find many references to contemporary neuroscience. This was not the case, however. Meulders' book only briefly acknowledges Helmholtz's contributions to contemporary investigations, and only in the context of his color theory.

“Neuroscience and cognitive science, as we call them today, owe numerous debts to Helmholtz and his contemporaries [Helmholtz], as well as attitudes. No phenomenon of nature, life, or environment is now regarded as being beyond the reach of the scientific method. Helmholtz's view of the mind indifferent to the world, and his claim that the mind had no a priori knowledge, were both rejected. He believed he could reconcile science and philosophy, and that the former had in the last resort a physiological basis that would one day doubtless be discovered.”

Personally, I think adding more specifics to this comment would have offered a better grasp of Helmholtz's accomplishments than the chapter on Goethe that Meulders can say about Helmholtz's color theory. As Meulders points out, Helmholtz developed a trichromatic (three-color) theory, which is based on the idea that the eye contains three types of color receptors. It is an additive color mixing theory and predicted the existence of three types of color receptors. What it does not explain are afterimages. A contemporary, Ewald Hering, a German phenomenologist, took issue with the trichromatic theory based on the experiments he conducted. Hering proposed an opponent process theory of two pairs of opposites according to which the eye contains only two types of color receptors. He argued that both theories could be equally valid. We now know that Hering was correct in his theory of color vision, but that both theories are correct in principle. The two theories are at different levels of visual processing, corresponding to the two theoretical approaches. In a sense, to a degree, both Helmholtz and Hering were correct in principle, although we now know that Hering's theory is the correct one.

In closing, even though there was a lot to like about this book. Those seeking a biography of Helmholtz may want to start with the excellent contemporary biography by Helmholtz's biographer, the German mathematician Leo Königsberger (which is available in full on Google Books). As I have noted, Meulders' book does not attempt to update the science relating to Helmholtz's work. The Königsberger book is out-of-date scientifically. Some more recent collections of Helmholtz's work are useful in pulling the threads together, particularly David Cahan's *Hermann von Helmholtz and the foundations of nineteenth-century science* [2].

References

[1] Königsberger, Leo. 1906. *Hermann von Helmholtz*. Clarendon Press.
Königsberger is available at
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[2] Cahan, David, ed. 1993. *Hermann von Helmholtz and the foundations of modern optics*. University of California Press.



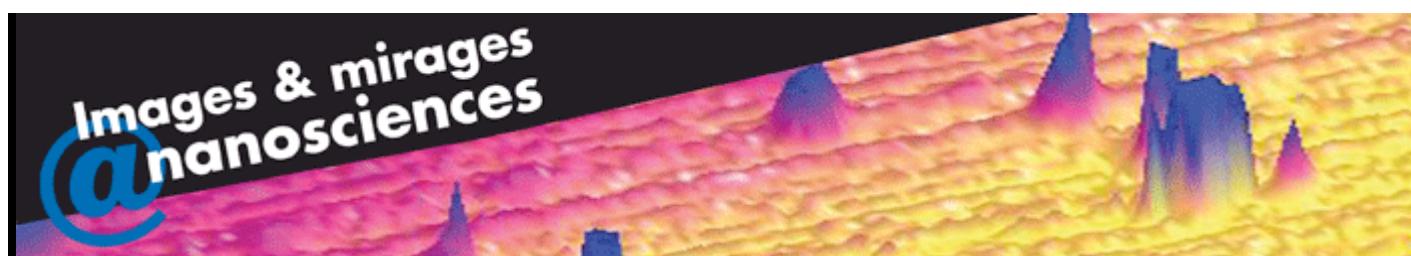
Images et mirages @ nanosciences. Regards croisés

Sous la direction d'Anne Sauvageot, Xavier Bouju

et Xavier Marie

Hermann. Paris

2011



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L'image est au cœur des nanosciences. Interface obligée entre le chercheur et la matière, elle rend visible ce qui pourtant est invisible à l'œil, ce qui en déborde le système optique. Fruits de médiations multiples – conception, calcul, simulation, design, observation, interprétation... –, que nous apprennent ces images sur notre regard instrumenté ? Que signifie « voir » l'invisible ? Les artistes comme les chercheurs – ou les artistes avec les chercheurs – témoignent ici de la construction d'une nouvelle « pensée visuelle », à mi-chemin entre le voir et le savoir, et nous aident à démêler les images de leurs mirages. Artistes, physiciens, chimistes, biologistes, philosophes, sociologues, critiques d'art et galeristes croisent ici leurs regards sur les impacts de certains outils scientifiques (les microscopes à sonde locale notamment), la dynamique de la représentation et de la simulation, les rapports entre le perçu et le réel, les modalités de la réception et de l'interprétation de ce nouveau monde des formes, mais aussi les dérives cognitives voire commerciales auxquelles il se prête. En s'appropriant ou en détournant les images et les artefacts scientifiques, quel est l'ordre des significations que leur apportent les artistes, que conservent-ils du contenu d'origine, quelles dimensions originales leur confèrent-ils et de quels messages les chargent-ils ?



Gabriella Giannachi and Nick Kaye

Performing Presence: Between the Live and the Simulated

Manchester University Press, Manchester, UK,

2011

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Presence: gift, being here-now, charged, fraught with tension, is a concept rich with layers of meaning – yet somehow always elusive, especially when embedded in simulated and live practices of multimedia theatre, video installation, mixed reality performance, and locative arts as questions about its nature are thrown into relief, like the shadows in Plato's cave.

Presence is not held static in a snapshot of present time being there, but is embodied relationally in actual active viewers, participants and performers; it is thrown between selves. As such it is a difficult concept to contemplate unless we think in process terms as this book attempts to do. The authors, in unrelenting examination, successfully, I believe, unearths questions, murmurings, articulations and well described philosophies (especially in critique of Husserl) that are useful in bringing understanding to this phenomenon.

Part of a major research project led by Giannachi and Kaye and funded by the UK Arts and Humanities Research Council, this hardback book will be of particular interest to students, researchers, and practitioners of theatre and performance, contemporary art, media, the new media, and technology. It explores the edge of art, science, technology, and philosophy through case studies, specifically the work of Lynn Hershman Leeson, Paul Sermon, Gary Hill, and Tony Oursler, The Builders Association and Blast Theory, as well as through the analyses of related environments created for CAVE (an immersive virtual reality environment). Clearly describing each of these projects, the authors give the reader clear *entrée*, through analysis and interviews with practitioners, to understanding some of the most exciting art and media projects being produced today.

Plato's cave analogy is a very useful place to start to think about the questions explored in this book. He wrote of Socrates' description of prisoners who have lived chained to the wall of a cave all of their lives, facing a blank wall. They watch shadows projected on to the wall by entities passing in front of a fire behind them and understand the images as

reality. Philosophers, Socrates claimed, are like these prisoners freed from their cave. Now, instead of shadows, they can perceive reality. Is virtual reality (the shadows on the walls of a cave) really virtual, or does it augment real reality, whatever that is? Is there actual reality or is all experience endlessly mediated by simulacra (words, included), as Baudrillard claimed in the days before computer generated environments? Is reality a construct? Plato thought there were perfect forms, in places beyond shadows; we, of the modern era, have a different stance: We play with our thoughts as shadows on the wall, observing them dance in difference and fusion. It is certainly interesting stuff, especially when the human element of presence (or telepresence) is added.

Virtual reality, as the authors of this book note (p. 119), are ‘technologies or environments that provide realistic cues to some or all the senses, sufficient to engender in the participant a willing suspension of disbelief’. We are used to thinking of virtual reality as computer generated – and this book reinforces that. The authors note that virtual reality can be presented in three ways: immersive or inclusive, via goggles, gloves or data suits; a desktop virtual reality 3-D technology observed through a window or screen; and ‘third person VR’ where you steer and view an image of yourself interacting in a virtual world. The image has a prosthetic quality and leads to a sense of having a double existence where the difference between presence and absence doesn’t matter any more. Any technology, however, has this capacity to ‘provide realistic cues to some or all the senses, sufficient to engender in the participant a willing suspension of disbelief.’ The written word is a prime example. We are trained to read shapes on a page or screen and make meaning through the lens of our

social group, our history, and our personal experiences. Thus, while the virtual technologies and the art forms that describe and are generated from them have become very sophisticated, the basic entwining and understanding of that chiasm remains somewhat mysterious. What is presented here in this book, *Performing presence: Between the Live and Simulated* is a thought-provoking and provocative account and analysis, but the work, in my view, has just begun.



Barbara Maria Stafford, Editor

**A Field Guide to a New Meta-Field:
A Bridging the Humanities -Neuroscience Divide**

University of Chicago Press, Chicago & London,

2011

Reviewed by Rob Harle

harle@robharle.com

Any book that helps demolish the stubbornly ingrained gospel of Cartesian bifurcation is, indeed, welcome. This book is a fairly major contribution to this deconstruction project not only in exposing Cartesian fallacies, but also suggesting positive, practical ways of putting "Humpty Dumpty back together again." The humanities and the neurosciences are two powerful "ways of knowing," and as all contributors to this volume agree, these two disciplines must start working co-operatively if we are to advance in unravelling the mysteries of existence and the part that our minds, brains and bodies play in this existence.

Stafford's aim in creating this book was not to provide definitive guidelines for bridging the humanities neuroscience divide *per se* but to literally develop a field guide that would point the way for future research. She uses the term "Meta-Field" to describe this new approach: "In addition to being a field guide, this book serves as a primer to intellectual possibilities and best practices in a metadiscipline that does not yet exist" (p. ix).

A Field Guide to a New Meta-Field is a scholarly collection of essays from leading thinkers in both the humanities and brain sciences. As such it is not really suited to general, popular readership. The essays presuppose a broad knowledge of modern critical/cultural theory and at least a basic familiarity with neuroscience terms and principles. The book is illustrated with numerous black & white drawings, diagrams and

photographs. There are nine wide- ranging chapters as the following titles indicate. These are preceded by Stafford's own introductory essay: *Crystal & Smoke*.

Chapter 1 â€“ *Tentacular Mind* discusses Stoicism, neuroscience, and the configurations of physical reality.

Chapter 2 â€“ *The Extended Mind* is an anthropological study on mind, agency, and smart materials.

Chapter 3 â€“ *Tartini's Devil* assesses how peripheral mechanisms underlie sensory illusions.

Chapter 4 â€“ *Sociovisual Perspective* looks at how understanding of visual form has changed over history, delving deep into the neurophysiology of seeing and the social construction of vision.

Chapter 5 â€“ *Ayahuasca Shamanic Visions* integrates aspects of neuroscience, spiritual experiences, and psychotherapy with particular emphasis on drug induced experiences.

Chapter 6 â€“ *The New Archaic* is about a new neurophenomenological approach to religious ways of knowing.

Chapter 7 â€“ *Lifting the Foot* discusses the neural underpinnings of the "pathological" response to music.

Chapter 8 â€“ *Alvar Aalto's Astonishing Rationalism* looks at the famous Finnish architect's approach to design, human expectations, and occupation of buildings, and his disagreement with Le Corbusier's philosophy of buildings as "machines for living."

Chapter 9 *Semantic Reciprocity* discusses cultural change specifically from the angle of visual art and corrects some of the erroneous assumptions made concerning the Renaissance period.

One thing that stands out from the research that produced the essays in this book is that the brain, mind, and embodiment are far more complex than most researches ever dared imagine. As Stafford mentions; "A major message of this book is that one way of getting past what Damasio saw as the "abyssal [Cartesian] separation between body and mind" is for neuroscientists not to limit their cultural considerations to the evidence provided by grammatically complex symbolic languages. We know that our gesturing and tool-making hominid ancestors lacked such syntactical activity. What they had, and we still have, are sophisticated compositional structures for mirroring complex mental and social situations by performing them as intersubjective events" (p. 45).

The new story beginning to unfold, as encapsulated in Stafford's new meta-field is a Kuhnian paradigm breaking work in progress. The essays in this book will challenge many "hide-bound" academics' stale and outmoded paradigms, and certainly make most readers sit up and think very seriously about the future direction of their research. "The essays are proof that the neurosciences cannot dispense with the humanities in their analyses of the brain. Equally, the humanities must reckon with scientific findings. Desegregating those who address the outer and inner worlds gets rid of warring over prestige and funds" (p. 58).



Francesca Bacci and David Melcher, Editors

Art and the Senses

Oxford University Press, Oxford, UK.

2011

Reviewed by Rob Harle

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It seems cross-cultural, transdisciplinary scholarship is increasing at an almost exponential rate. The last five books I have reviewed have all been concerned with fostering a mutually advantageous relationship between science and the humanities. This book is exemplary in this regard, specifically exploring the scientific and common sense understanding of the *senses* and their relationship to the arts. Art is used in the broadest manner and includes all modes of creative artistic endeavour from basic crafts through to opera, fine art, cinema and classical music.

Art and the Senses is no shrinking violet. Weighing in at just

under 650 pages, it covers a lot of ground. The essays explore many of the subjects discussed at the *Art & Senses Workshop* at Oxford, England in 2006. “The aim of this project, in addition to providing a unique multidisciplinary resource on the senses, is to inspire future cross-boundary interactions”. The book does not claim or aspire to be the definitive work but rather to offer, “a collection of examples on how scientists, artists, and scholars in the humanities are investigating and commenting on the senses” (p. 2). The editors Francesca Bacci and David Melcher (both from the University of Trento, Italy) have done an excellent job in achieving this aim.

Following the Foreword by Siân Ede, the List of Contributors, and the Editor's Introduction, there are 31 chapters with such enticing titles as: *Hearing Scents, Tasting Sights: Towards a Cross-Cultural Multimodal Theory of Aesthetics*; — *Mirror Neurons and Art*; — *Visual Music and Musical Paintings: The Quest for Synaesthesia in the Arts*, space does not permit listing them all. There is literally something for everyone; all the essays are well written, accessible to both academic and well educated general readers and cover a huge range of history. Some of the chapters are in-depth philosophical investigations into aesthetics and the senses; others take the form of discussions between scholars, and still others are more accounts of practising artists who have a major concern about their work and sensory response. The book has numerous black and white photos and illustrations and a small number of colour plates.

Two essays that particularly struck a chord with me were *Aesthetic Touch* by Rosalyn Driscoll and *Sculpture and Touch* by Bacci. These authors discuss the underrated importance of

touch, and how touch influences and modifies the other senses. Driscoll creates sculptures specifically to be felt and explored through touch. During the 80s and 90s I often had a sign displayed on my own sculpture exhibits. “Please Touch Me”. Given the general restriction of touching a work of “Fine Art” this unnerved quite a few gallery goers! This was, of course, my intention — what damage could someone running their hands over a half tonne piece of marble do?

As these two authors point out specifically, and some of the other contributors generally, denying an observer the right to touch a sculpture, which more than any other art form is created by direct hands-on touching, is absurd. The result is an impoverished, incomplete experience of the artwork. This taboo of not touching is not only restricted to artwork, but rather it spills over into everyday life. In the village where I live we have a saying, “Three hugs a day keeps you healthy,” but many adults never touch other human beings. The further we move towards online, mechanistic lifestyles, together with the possibility of sexual harassment charges for touching a fellow worker on the arm in a complimentary way, the more our quality of life as humans becomes compromised.

This book has ramifications far beyond the arts. Perhaps this was not originally intended by the editors, but it is an important bonus because as many of the contributors show, we now know the senses do not exist in isolation or as separate entities. Each sense modifies the experience of the others. As an example, to touch a fine crystal glass alters the actual visual experience of the glass! “The mainstream view in cognitive science was, and to a certain extent even today is, that action, perception, and cognition are to be seen as separate domains.

The discovery of the MNS [Mirror Neuron System] challenges this view as it shows that such domains are intimately intertwined" (p. 456).

Art and The Senses is a vitally important book and applies to so many different research disciplines that I cannot begin to suggest them all. One area, though, that I think will benefit immensely from the application of the findings presented in this volume is the healing profession, particularly psychotherapy and art therapy.



Riccardo Manzotti

Situated Aesthetics: Art Beyond the Skin

Imprint Academic, Exeter, UK,

2011

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Situated Aesthetics: Art Beyond the Skin is the fruit of a workshop held in Milan in September 2009. The workshop

brought together cognitive and neuroscientists, artists, philosophers, and others interested in expanding beyond the reductionistic, brain-focused approach that predominated in early art and the brain publications. Divided into three parts, the book first examines research that situates externalism within aesthetics in general. A second section then examines externalism in relation to different artistic forms. The third part explores the concept through specific artworks.

While collections of this sort frequently feel as if they were pieced together, all of the *Situated Aesthetics* papers are quite strong. Moreover, and to the credit of the contributors, the book carries the give-and-take of workshop conversations into the published papers. Thus, there is a real sense of an engagement among the authors as they present their ideas. Riccardo Manzotti, the editor, begins with an overview of the papers and the current externalist approaches in neuroscience, cognitive science, and philosophy of mind. Here he nicely summarizes the ideas of earlier authors and convincingly explains why adding externalism to the equation is important.

In his words:

“By and large, externalism is the view that the external world is relevant and indeed constitutive of the subject, which is more extended than the body. In particular, externalism is taken as the view that the physical underpinnings of the mind are spatio-temporally more extended than the neural activity inside the nervous system. For the purposes of this volume, the key is the fact that a shift in the subject’s ontology will inevitably have repercussions for any theory of aesthetics.” (p. 3)

As someone who often finds art and the brain research too

narrowly based, I was glad to see that the volume includes visual art, music, text-based views ,and even work that fits within an art/sci/tech framework. (For example, Stéphane Dumas looks at contemporary artists and theories in terms of biotechnologies.) This range reminds the reader that there are

commonalities among the arts and nuances particular to specific media. The comprehensive approach is even evident within the articles. Not only do some authors refer to other

articles in the book; at times writers offer more than one perspective on a topic. While these papers do not explicitly

address the early reductionistic way of placing art in the spiritual realm, their efforts to recognize the systemic qualities that are a part of art making and art appreciation will no doubt

help us to further move beyond the framework that either relegated art to the spiritual realm or inadequately spoke about

cognitive functions, environmental influences, and experiential/experimental aspects of all art forms.

For example, Joel Krueger and Liliana Albertazzi both connect art with extended space. Krueger's essay, "Enacting

Musical Content," presents music as an active skill that involves a physical interaction with the space where the music is heard and performed. This includes an investigation of how sensorimotor regularities grant perceptual access to music *qua* music. In other words, he argues that music is more than just sound. Thus, musical expression requires some attention to the

music *qua* music, an approach that looks beyond "mere sounds." Presenting such an approach, Krueger defends the ideas that music manifests experientially as having spatial content and presents the holistic component of the externalistic view.

Albertazzi, who writes from a visual art and pictorial

representation perspective, focuses on the structure and nature of extended space. She sees “extended space” as a structure of our aesthetic experience and of the perceived physical world.

Thus, for Albertazzi, the extended space is neither a purely phenomenological description of the lived nor a merely physical notion, but rather a concept we can use as an explicative bridge between externalist and internalist views.

Her view offers a path beyond the self-referential and an approach that allows for artistic expression as well as the audience’s aesthetic experience.

“Externalism, Mind, and Art” by Erik Myin and Johan Veldeman and “Art and Extensionism” by Robert Pepperell are also compelling articles. As his title suggests, Pepperell uses the term extensionism to stress the extended dimensions of objects and events rather than the distinctions between them. Applying this approach to the analysis of art reveals the widely distributed nature of artworks and the mental qualities they convey. Pepperell explains concerns that are not brain-centric and his view is a fertile argument for the analysis of art as extended into the environment.

By contrast, Myin and Veldeman emphasize the importance of the externalist approach more generally. They first analyze the pros and cons of active and exploratory externalism in their analysis of cognitive mental processes. Then, they apply their ideas to contemporary art and aesthetic experience.

Compiling complicated ideas in this quite readable essay both challenges the contextualist’s claim about the existence of an anti-aesthetic art and also includes an analysis of useful work that is (overly) focused on the brain. Their conclusion, that contemporary artworks challenge the assumption that our visual response to visual artwork is “purely” phenomenal, is

convincing, as is their argument that the activity of looking at artworks serves many purposes.

It is noteworthy that Imprint Academic, the publisher of this refreshing volume, also initiated several of the early art and the brain discussions. Their 1999 issue on “Art and the Brain” (a volume of the *Journal of Consciousness Studies*) presented the now classic articles on the subject by V. J. Ramachandran and Semir Zeki. When the editors invited commentary of the scientific articles, it was clear from the varied reactions that implicit tenets of the scientists were not shared by all with an interest in a systemic approach to art and the brain. Imprint Academic has since published a number of special issues probing art, aesthetics, and other related topics. Extending the discussion has helped the field grow significantly. To

oversimplify how the trajectory has changed and matured, while many argued that the early work of Ramachandran and Zeki neglected artistic process and the realms outside of brain activity, *Situated Aesthetics* shows that the artists, theorists, and scientists are clearly intent on filling in some of the early lacunae within the field. Not only does this volume expand the dialogue, it also feels much more contemporary than the early papers, which seemed out of touch with today’s art world and the experimental media that has transformed the way artists work.

Finally, the book states that the workshop showed there is common ground for future research activities. These authors show both that there is a broadly based constituency for using cognitive and neural inspired techniques and that the domain of art extends way beyond the limited brain approach. No doubt the ideas presented by these authors will help art historians, museum curators, art archiving, art preservation,

scientists, and philosophers. The volume also shows bridges are developing across disciplines. Now cognitive scientists and neuroscientists appear open to using art as a special way of accessing the structures of the mind, artists and theorists add cultural/experiential concerns to the equation; and there are also artists who explicitly draw inspiration from current research on various aspects of the mind. This book, which is substantive and yet easy to read, has whetted my appetite. I look forward to seeing how the methodological paradigm that emerged from this workshop takes form once these ideas become a part of the broader conversation.

Reference:

[1] Imprint Academic's three publications on *Art and the Brain* and their other art related special issues are available at <http://www.imprint.co.uk/>.



Susan Broadhurst

Digital Practices: Aesthetic and Neuroesthetic Approaches to Performance and Technology

Palgrave Macmillan, New York, Hampshire, USA, UK

2011

Reviewed by Rob Harle

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This book is an excellent addition to the rather sparse scholarly literature concerning digital technology as used in conjunction with performance art. Broadhurst analyses digital performance from both pragmatic and theoretical perspectives. A detailed discussion of a number of "case studies" helps her explain clearly her premise of the importance of "the exploration and investigation into the physical/virtual interface so prevalent within the digital" (p. 186).

This interface between the physical and virtual is the critical phase space for Broadhurst, and it underpins her analysis throughout the book. "It is my belief that technology's most important contribution to art is the enhancement and reconfiguration of an aesthetic creative potential that consists of interacting with and reacting to a physical body. For, it is within these tension-filled (liminal) spaces of physical and virtual interface that opportunities arise for new experimental forms and practice" (p.194).

The book has a smattering of black & white photographs, mainly to help the reader visualize the performances Broadhurst is discussing. There are eight chapters, together with an excellent Index and Bibliography.

Chapter 1 – The Digital: A Preliminary View gives a brief, useful introduction to digital performance and the issues involved.

Chapter 2 – Selective Aesthetic Approaches discusses very briefly, and somewhat superficially, the theoretical views of various philosophers including Merleau-Ponty, Lyotard, Derrida and Deleuze. This chapter left me completely underwhelmed and did not, in my opinion, add much to the rest of the book.

Chapter 3 – Neuroesthetics, though necessarily brief, is an excellent introduction into this nascent discipline. And a good starting off place for those with great enthusiasm and little knowledge of this subject.

Chapter 4 – Live Performance and the Digital discusses, in detail, three fairly well known art pieces: The Jeremiah Project, Blue Bloodshot Flowers. Cunningham's Biped. Stelarc's, Obsolete Body.

Chapter 5 – Digital Sound, New Media and Interactive Performance analyses and describes three main pieces: Optik (Contact, impulse and electro-acoustic sound). Palindrome (Intermedia, collaboration and interaction). Troika Ranch's (An electronic disturbance)

Chapter 6 – Digital Film looks in some detail at The Matrix Trilogy and the various Star Wars prequels. Broadhurst reveals some fascinating, not commonly known facts about these films, their creators and the technology involved in their creation.

Chapter 7 – Bioart, again three works are analysed in fascinating detail. Kac's Transgenic Art. Critical Art Ensemble's recombinant theatre. De Meneze's Aestheticizing of Evolution. Even though I was familiar with Kac's work, Broadhurst's analysis of his radical science-art transgenic creations broadened my understanding considerably.

Chapter 8 – Conclusion: Digital Practices is more or less a summary of the preceding chapters.

This book goes a long way in helping us better understand the process of experimental, digitally underpinned, performance and interactive art.

“It is my belief that digital practices, as experimental artworks and performances, both serve as critique and have an indirect effect on the social and political...” “In this sense, the digital does what all avant-garde does; it is an experimental extension of the socio-political and cultural of an epoch” (p. 185), Herein lies the importance of these contemporary art practices.

As I mentioned earlier, chapter two does not, in my opinion, add a great deal to the rest of the book. The first edition of Digital Practices: Aesthetic and Neuroesthetic Approaches to Performance and Technology was published in 2007 in hardback and, now, this soft-cover edition published in 2011 is available. A lot of electrons have flowed under the digital bridge since 2007, and we are now, according to many, into the post-digital era and certainly the post postmodern. I would have liked to have seen in this edition, chapter three expanded considerably, and chapter two deleted. Neuroesthetics is a fledgling field of enquiry and promises to answer many previously unanswered questions concerning the making and appreciation of art. I have often wondered why representational and narrative style artwork stand the test of time and are still so popular world wide, cross-culturally. I believe Broadhurst answers this question in her neuroesthetic investigations. These show that many more areas of the brain are activated when we experience these works than in more abstract or conceptual works: “Non representational works of art activate fewer areas of the brain than representational and narrative art” (p. 116-117). Perhaps there is a lesson to be learnt here, regardless of whether we are creating traditional or digital art?



Samuel Bianchini, Nathalie Delprat, Christian Jacquemin

SIMULATION TECHNOLOGIQUE ET MATÉRIALISATION ARTISTIQUE

Une exploration transdisciplinaire arts/sciences

L'harmattan, Paris

2012

S'appuyant principalement sur les technologies numériques, la simulation n'a cessé de se développer depuis une trentaine d'années. Aujourd'hui, la création artistique comme la recherche scientifique semblent préoccupées par les liens existant entre les univers numériques et le monde physique, et par les relations à inventer entre la simulation et de nouvelles

formes de matérialisation : médias tangibles, prototypage rapide, physical computing, internet des objets, interfaces mixtes, réalité augmentée, captation gestuelle...