Intellectual Babel: Knowledge between Sciences and Letters by Alexander Dmitrishin
Real, Digital and (neo)Material: Thinking Digital Dualism through Media Archaeology by Eva Zekány
The Synesthetic Scientist: The Induction of Sense-Mixing to Open New Frontiers in the Laboratory by Emily D. Šaras
Silent Witness: the Construction of Photographic Truth in Forensic Science by Victoria Fomina
Medicalization of Masturbation Travels East: a Serbian Case Study by Ljiljana Pantović

AIDS Crisis by Chris Zivalich
Codifications of Man: Handbooks, Guides, and Iron John by Frank G. Karioris
Serresian Xenobiophilosophy, or How to Think (the) Alien Life off(f) the Planet by Manta Alexandra Claudia
Humanized Mice and the Deleuzian Differentiation Between Science and Philosophy by Maria Temmes
ABOUT PULSE

PULSE is affiliated with Central European University (CEU) through the Gender Studies Department. Centered within the interdisciplinary field of Science Studies, PULSE is a peer-reviewed international journal that accepts papers from undergraduate, graduate, and post-graduate students. The Editorial Team accepts submissions of written or creative materials at PULSE.SCISTUDIES@GMAIL.COM. We consider all scholarship related to the general themes of the journal, or to specific thematic issues.

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FOREWORD

Moving to The Rhythms of Knowledge-Production
or Let's Dance Together a New Epistemology for the Humanities

BY GRANTING HISTORICAL
specificity and political
coherence to what might be
called the epistemic paradigm of
‘Western thought’ - namely, to
the constellation of locally and
globally interacting discourses
about the value and authority of
knowledge, about its modes of
practice, instruments, and
effects, which has admittedly
emerged in the past few decades
as much through its 'representatives' as through its
critics – one could speak,
following Michel Serres, of
some sort of Western gag-reflex: “one wonders if Western
thought has ever ceased starting
over again, automatically, like a
reflex, since its beginnings”
(Conversations on Science,
Choking on the past and
wishing to start anew has been
the teleo-logics that both the
‘sciences’ and the ‘humanities’
have subscribed to, in more or
less acknowledged self-
emancipatory efforts. Both
historical epistemology and the
numerous ‘turns’ in critical
theory blatantly tell such a
story. Should we wish to move
our foot forward, turn the page,
publish yet another journal,
start yet again?

Over the years, the conviction
that life and thought are
dynamically tied and untied in a
tense relationship has only
strengthened. As Michel Polanyi
argues, “to trust that a thing [...] is real is to feel that it has the
independence and power for
manifesting itself in yet
unthought of ways in the
future” (qt. Hans-Jörg Rheinberger, *An Epistemology of the Concrete* 2010, p. 272). In order to live, one has to navigate the complex materiality of the body, of social relations, political structures, economic transactions, and planetary anxieties by means of a thought as soft and mobile as the rhythm of one's pulsating gut. Should this instinct for starting anew be considered the gag-reflex of intellectually bulimic scientists and philosophers? Or perhaps is it a gaping for air and an intensification of the striving required for our organic and mental dancing to the rhythms of the world? **PULSE: A History, Sociology, & Philosophy of Science Journal** constituted itself along the lines of such striving - not merely as an empty gesture calling for 'more knowledge,' but in the attempt to take seriously the life of thinking and the thought of life in the context of post-1960 ‘deep’ historicization of scientific knowledge, and extensive scientification of knowledge in its historical forms. The question has shifted from the critique of science as carried by feminist epistemology and post-colonial studies, towards the opening up of science, as a historically quite dominant form of knowledge-production, to less dominant knowledges, for the purposes of epistemic cross-breeding and interspeciation. Previous criticisms should not be discarded, nor overcome, but not transformed into the limit of our thinking and into an obstacle for both epistemic and political outsourcing. There is a politics of knowledge as there is a politics of politics, but we should not easily assume that they parallel each other, nor fully determine each other, as if there is no temporal distance and difference in medium between thinking and doing, *theoria* and *praxis*. What our assumptions are about their interaction is always a question worth posing, and the case of science acutely emphasizes the often self-imposed intellectual starvation of both humanities and science scholars, when it comes to feeding on the provisions of others.

In the end, this journal stands as the product of a group of dedicated academics that each in their own way have contributed greatly to its concre-
tion. On the one hand, it is meant to suggest an intra-departmental strategy for taking gender studies research into the direction of the “new humanities,” thus joining into the problematization of “scientific” knowledge through historical, sociological, anthropological, and philo-sophical (cross-) examination, interrogation, as well as through contextualization. On the other hand, it wishes to promote an interdisciplinary and inter-departmental cooperation hub as a platform for conversations between graduate and post-graduate students, and also among students and faculty. We warmly welcome the future collaboration of the Sociology and Social Anthropology, History, Medieval Studies, Philosophy, and Cognitive Science Departments. We hope the current content of the journal will not prevent its future becoming in ways yet “unthought of.”

We have many individuals and groups that we must thank for helping us to make this first issue of Pulse possible. We would like to express our gratitude towards Anna Loutfi, without whose constant support, tireless encouragement, intellectual sophistication, and great patience, Pulse would not have come to fruition. Most papers gathered in the journal are substantially revised versions of papers submitted for her MA course, Introduction to the History and Sociology of Science, currently part of the inter-departmental project of the Science Studies Research Unit at CEU. We wish to heartily thank Allaine Cerwonka, whose leadership initiative, strong commitment, resourcefulness, and intellectual curiosity have fundamentally contributed to the establishment of the Science Studies Research Unit. Last, but not least, we wish to recognize all the faculty and staff who have worked with the various authors on their individual projects throughout the year, resulting in the various contributions we are proud to present in this issue.

It is crucial to recognize our immense debt to the brilliant designer Ákos Polgárdi, who has created the wonderful cover of our journal’s first issue and has assisted so much as our journal’s design consultant. We also thank the artist Angelika Tóth
for allowing us to use her painting *Exodus* within our publication. Ákos’s work is on [behance.net/AkosPolgardi](http://behance.net/AkosPolgardi) and Angelika’s work is on [Angelikatoth.com](http://Angelikatoth.com). They have highly contributed to the aesthetic enhancement of the journal through their originality and amazing skill.

We need to thank our reviewers, a team of both MA and PhD students from the Gender Studies Department and Sociology and Social Anthropology Department at CEU, as well as the editors. We would like to specifically mention here Franciska Cettl, not to be found in the pages of the journal, but who has otherwise helped significantly in its creation.

We strongly encourage you – with the Kantian words, but a different nuance – to *dare think* differently, across the boundaries of your disciplines and outside of territories that allow you the comfort of already acquired expertise. Errors themselves are never unproductive in the history of knowledge-making.

We warmly invite you to join us in next year's adventure, and help us set up a new interdepartmental program at Central European University and beyond.

We must indeed dance, but whose rhythm to keep if isolated? In this way, we hope others will join us in dancing a new epistemology for the humanities.

Sincerely,

**THE EDITORS**
INTRODUCTION

Manta Alexandra Claudia & Frank G. Karioris

SOMETHING HAD STARTED UNFOLDING IN THE Central European University Gender Studies Department during the winter of 2010-2011. A Foucauldian wind of change was blowing across a couple of master classes. Some people were excited, others bedazzled: who is this new dead white man of French descent, to tell us resistance is the trickster of power and not its undoing? The clamor of being caught in the politics of gendered bodies. Indeed, how to ruin the all-too-human(ist) hopes of persons for so long de-humanized through a historical system of violent inequity, and get away with it too? Nonetheless, where some people could only see threats, others could conceive of promises. Michel Foucault had not merely postulated a “history of problematizations” as a way of thinking the relationship between thought and its objects of knowledge, by means of reconceptualizing the latter as clusters of questions whose historically-, geographically-, socially-, and culturally-embedded
answers could only retrospectively and virtually re-compose the objects of thought. “To one single set of difficulties, several responses can be made. And most of the time different responses are actually proposed. But what must be understood is what makes them simultaneously possible: it is the point in which their simultaneity is rooted; it is the soil that can nourish them all in their diversity and sometimes in spite of their contradictions” (Michel Foucault, “Polemics, Politics, and Problematics” 1994, p. 118).

Besides addressing the historical life of epistemic problems, he proposed a new philosophy of power – biopolitics in the parlance of contemporary Continental political philosophy – that would afford “science,” as one historically mobile constellation of truth-statements, and of practices of truth-making, a new type of analytical lens. That is perhaps why Anna Loutfi’s 2010 course Foucault: A Critical Introduction would fractalize over the years in courses such as From Biopolitics to Necropolitics – Theorizing Life and Death in the Twentieth and Twenty First Centuries (2011/2012) and Medical Subjects: Disease, Immunity, and Health in the Modern West (2012). And yet a new perspective would meet the “governmental” approach to medicine, psychiatry, and notions of “care” fostered by Foucauldian scholarship – in 2010/2011 Allaine Cerwonka would return from sabbatical leave to teach The Human and Post-Human MA course. It’s not the case that Foucauldian nuances are lacking in the “post-humanities,” but the emphasis has shifted to a considerable degree on questions of materiality and ad-hoc encounters between non-human bodies (whether animals, machines, information bits, viruses and bacteria, the external environment or the inner milieu, cash flows and dirt) and human bodies (of whatever gender, race, class, ability condition, sexuality etc).

In a sense, the real is not what stands right before us ...
This shift, we would like to remark, should not be totally disconnected from the kind of materialization laboratory studies have performed within the historiography of science. One should think here not only of Bruno Latour and Michel Callon – as many surely do – but also of Gaston Bachelard and Ludwick Fleck. The new work generally highlighted (1) the acute need of grasping knowledge-making processes in real time, inside laboratory walls, as simultaneously material, conceptual, and social acts – not in terms of individual work of testing scientific hypothesis against the 'truth' of natural states-of-fact, but in terms of a collective enterprise more fluid and more mediated than originally thought; (2) the importance of rethinking the relationship between theory and fact, between “rationalism” and “empiricism,” and of moving beyond this binary framework; (3) the importance of pluralism in approaching different types of scientific works for assessing their truth-value (disparate methodologies, instruments, criteria for testing, interpreting, and evaluating results, “microrationalities”); (4) the recursion or rectifying movement at the heart of science's own self-authentication procedures; (5) the centrality of technology to the operativity of science, technology which does not merely embody validated scientific knowledge and acts as its application in a specific social and historical context, but which through its mediation-work actually questions, re-orients, reaffirms or destroys that scientific knowledge. Direct access to truth was a counterfeit promise since truth can only be accessed through a conceptual-technical apparatus that is the materiality of science (the use of instruments, the procedures of experimentation, the protocols for reading and verifying both apparatus' data and its manipulations).

In a sense, the real is not what stands right before us, but the (multiple and convoluted) process through which the real is passed through all the machinery, techniques, and discourses that make it stand before us as if by itself. This recipe would be carried further in Hans-Jörg Rheinberger's work, and in the scholarship of what passes for the Max Planck "school" in history of science.
From these various courses and theoretical frameworks emerged the interdepartmental project of the Science Studies Research Unit at CEU. This research unit has broadened the scope of what were initially individual classes taught by specific professors, and has created a community dedicated to the investigation of science as a method, discipline, and epistemological actor. This journal, as previously stated, offers public access to some of the first works to come out from this unit, and it marks a furthering of the unit’s fundamental goals. Our mission, then, has been in part to displace the “soft” sciences from their “canonical” position as “background” voices providing the usual socio-cultural “unmasking” commentary on the politics of the “hard” facts of science. The inherent interdisciplinarity and plurimethodology of gender studies research have been instrumental in fostering the questioning of boundary-making epistemic politics and policies with respect to what counts as “science” from both a conceptual and a practical perspective. Additionally, we have attempted throughout to disrupt thought-automatisms forging the authoritative antithesis between the humanism of the “humanities” and the “in-humanity” of the sciences.

We wish in the future to focus more carefully, and in more sophisticated ways, on the specificity of material-discursive contexts of practice, and matrices of power in the constitution of “science”; on the importance of collective networks, of different media and institutions for the transmission, reproduction, and 'adulteration' of scientific knowledge; on forms of communication and (non)intelligibility; on the politics of epistemology; on gender, race, class, sexuality, colonialism, and imperialism as historical modulators of knowledge-production; on the dynamics of knowledge-assessment, knowledge-legitimization, and knowledge-dissemination processes; on current debates in critical animal studies, neuroscience, biotechnology and post-genomics, chaos and complexity, etc.
Indeed, one can follow many of these trends as they crystallize in the sections of the journal: a “Foucauldian” section on Medicalization in a Biopolitical Framework; a more STS section concerned with Science and Sense Technologies; a “post-humanities” section on Science, Materiality, & New Biologies. The remaining sections either address broader epistemological preoccupations within history of science, such as boundary-making practices across academic disciplines and dualism in thinking the media of knowledge (Science & Boundary-Making Practices) or, alternatively, reinvigorate a more 'canonical' genre in gender/feminist studies of science while attempting to move beyond the types of criticisms usually rehearsed (Gender, Sexuality, Science).

The first section, entitled Science & Boundary-Making Practices, opens with an investigation into the interstices and divisions between the sciences and the humanities. Alexander Dmitrishin’s paper is narrowly focused on the epistemic challenges launched by Charles Snow’s argument on the Great Divide between the “hard sciences” and the “humanities,” during a series of lectures at Cambridge in 1959. It attempts to highlight the historically different, yet persistent ways, of drawing the science/ humanities socio-epistemic boundaries as the local process of unfolding of a broader dialectics, between modes of logical reasoning such as inductivism vs. deductivism; and between epistemological methodologies such as rationalism vs. empiricism.

Moving from the Science Wars to the Great Dualism Debates, Eva Zekany’s piece offers insights into current theoretical strands in neo/materialist media archeology (Jussi Parikka & Eugene Thacker) capable of overcoming the intrinsic limits of digital dualism within cyberspace studies. How do we move beyond either the extreme embracing, or the extreme rejection, of an ontological difference between the “real” (offline) and “virtual” (online) spaces of communication? Her paper offers some sophisticated answers leaning in favor of a historicized materiality of media capable not only of highlighting the differences between the variously
interacting media, but – most importantly – the historical relations producing those differences and their dynamics.

The next section, SCIENCE & SENSE TECHNOLOGIES, questions objectivity in relation to the operativity of human sensation within experimental and technological contexts. Emily Daina Šaras' paper offers a bold proposition for avant-garde synesthetic reconfiguration of laboratory experimental techniques, methodologies, and codes of perception. Moving away from a canonical visual and ocular-centric epistemology would trigger, in Šaras' view, not only the reconceptualization of the “human” in terms of her or his bodily sensory capacities, but also the rethinking of the meaning of science there where objectivity is displaced and blends with the subjective. A similar questioning of objectivity takes place in Victoria Fomina’s piece on the process of truth-production in forensic photography. Using insights from Dason & Galison's Objectivity, as well as Roland Barthes, she questions the possibility of separating objective and subjective dimensions in the production of images within the specific context of crime scene interpretation.

The third section, titled MEDICALIZATION IN A BIOPOLITICAL FRAMEWORK, discloses a Foucauldian governmental perspective on medicalization, either in relation to anti-masturbation campaigns, or in relation to Internet-based practices of self-treatment for diabetes. Ljiliana Pantović's paper focuses on the case study of Serbian anti-masturbation literature in order to demonstrate the intrinsic links between state formation processes, changing governmental regimes, and medicalization of masturbation. Using a Foucauldian perspective, she discusses the pathologization of masturbation in its Eastern nuances, through an interesting comparative lens. Frank Karioris and Ezgican Özdemir's collaborative work alternatively tackles the new forms of biopolitical citizenship activated in processes of internet-based diabetes management and self-treatment by patients.

The fourth section, GENDER, SEXUALITY, & SCIENCE, opens with Chris Zivalich's paper
addressing, within the paradigm of the “neurological self” established by Fernando Vidal, the brain-centered research on homosexuality, gender difference, and expression of sexual orientation in the period after the 1980s HIV/AIDS crisis in the United States. Drawing upon the scholarship of Fausto-Sterling, Elizabeth Wilson & recent new materialism, he attempts to historicize the “gay brain” paradigm in scientific research on human sexuality. Frank G. Karioris continues this discussion of science’s relation to issues of masculinity by seeking to understand the utilization of science as a method in relation to the creation of a specific man and masculinity, looking particularly at Robert Bly’s book Iron John to give concrete examples of this practice.

The last section, SCIENCE, MATERIALITY, & NEW BIOLOGIES, attempts to imagine new forms of thinking life, whether in the context of the emergence of the “inhuman” as ontological and epistemological agent in Michel Serres' philosophy, whether in the biotechnological context of transgenic “humanized mice” for human-centered medical research. Manta's paper focuses on Michel Serres' work, where he advances a “chaos and complexity” materialist model of non-teleological cosmic ontogenesis. The concept of life itself is, in this context, deanthropomorphized, no longer understood through the, “vitalism” of the organism implying particular forms “teleological modes of functioning of closed material systems, but through homeorrhèsis, a material energetism that rethinks materiality and organicity as non-linear, un-formed, yet informing movement. Maria Temmes' paper is concerned with biomedical research - the lab experimental production and investigative testing of humanized mice - and its material-conceptual potential in working as destabilizer of the Deleuzian philosophical field: indeed, it asks how the Deleuzian conceptualizations of “science” and of “philosophy” can be seen as entangled in the very practice of creative post-genomic manipulation.
SCIENCE & Boundary-Making Practices
INTELLECTUAL BABEL:

Knowledge between Sciences and Letters
Alexander Dmitrishin

ON THE 7TH OF MAY 1959, Charles P. Snow, a British chemist and literary figure, gave a lecture at venerable Halls of Cambridge in which he lamented the growing division and lack of communication between scientists and men of letters (Snow, 1959). The lecture provoked a vehement public response, far beyond the original intention of Snow to grouse about certain shortcomings of the British educational system. The topic, which came to be variously known as The Great Divide or The Two Cultures, generated a long lasting polemics; it led to sharp intellectual exchanges, disciplinary introspections, and even to the setting up of a specialized institution.¹

Eventually, the cantankerous intellectuals divided themselves into two camps. Some accepted the Snow thesis, and even proposed possible solutions. Others were not very impressed. Stephen J. Gould, for instance, devoted a whole book to rebuke the great divide argument, eloquently turning it into a metaphor of centennial fox-hedgehog struggle (Gould, 2003). He maintained that Snow’s declarations led to unnecessary confrontation and

¹ Lyman Briggs College of Michigan State University was set up to address the problem of the two cultures.
Regardless of the position that we may be enticed to take, certain mistrust between the men of the aforementioned intellectual pursuits ventured well into the 21st century and provided inspiration for an occasional squabble, dispute or prank. Two notable cases from opposing camps amused and polarized the educated public in the last decades.

In the first case, a physics professor from New York University, Alan Sokal submitted a hoax-article “Towards Transformative Hermeneutics of Quantum Gravity” (Sokal, 1996a) that, in the words of the author, was nothing more than a parody that “sounded good and […] flattered the editors’ ideological preconceptions” (Sokal, 1996b, p. 62). The article was published in Social Text, a humanities journal that did not have a peer-review process in place at the time of publication. The success of the hoax, which bears the name of its overtly proud begetter, led to a bitter confrontation in a larger conflict commonly known as The Science Wars.

In the war, however, luck is fickle. Just some years after things finally settled down, the humanities camp – inadvertently as it was – struck back. A set of theoretical physics articles published in reputable peer-reviewed journals turned out to be utterly meaningless. The articles were submitted by French twins Igor and Grishka Bogdanov and, according to an amusing article of John Baez, a prominent physicist, are “a mishmash of superficially plausible sentences containing the right buzzwords in approximately the right order” (Baez, 2010). The “reverse Sokal affair” demonstrated that neither the stern disciplines of the natural sciences, nor commonly accepted scientific procedures are safe from human blunder.

The Science wars burned out into a latent conflict, which, however, may flare up again at any moment. So, what are the stumbling blocks of a reconciliation process? Obviously, there is a set of
misconceptions in both camps about rival systems of knowledge, perpetuated by gross reluctance to listen. Then there are exaggerated accusations of determinism on one side and militant relativism on the other. And, finally, there is Bruno Latour patrolling a lab and pestering overworked men in white with incessant questioning.

“We believe in external reality with its immutable laws” aver scientific hardliners. But this is simply not true. The theory of relativity, for instance, subjected the world to a position of observer, which is not much different from the relativistic ideas of contemporary philosophical approaches. But the worst is yet to come. If we dove deeper into problems of strings, manifolds, sub-space time localizations, branes and brane worlds, then the complex divagations of post-modern philosophers would not seem to be so occult.

In fact, there are quite a few voices telling that the sciences and the humanities, despite bitter animosities, are utterly reconcilable. Among the prominent examples, Edward O. Wilson in his book *Consilience* investigates links between subjects as different as Thales’s natural philosophy, ancient atomistic ideas, neurobiology, Condorcet and Einstein (Wilson, 1999). Although from a somewhat different perspective, Stephen J. Gould and John Brockman both argued that a divide between the sciences and the humanities is not as deep as it is commonly perceived (Brockman, 1995).

Plato’s own disciple Aristotle, however, was not impressed by the obscure metaphysical ideas of his teacher ...

“Plato is my friend, but truth is a better friend”

Popular perceptions, however, are not the root of the problem. Scientific wars are not fought by the public, but rather by adamant zealots of the two cultures, since the attacks usually come from scholars determined to prove a certain superiority of their position. A
detailed analysis evokes an allegory of religious wars. The two camps often believe in the same things, they are more similar to each other than to other parts of the population, and yet, presently, they would not admit their similarity under a threat of death. This conflict is rooted in past immemorial and one would doubtfully remember its true origins. Snow’s revelations and the Science wars are just different facets of the centuries-old conflict on the best way of knowing and on the nature of knowledge itself. Yet, one of its causes, its holy land and the most vicious battleground is the question of method.

In sciences as well as in the humanities, rules of logic are paramount to sound conclusions. Logic, in turn, can be deductive and inductive. In deductive logic, provided premises are correct and rules are followed, conclusions are always correct. Inductive logic cannot afford itself such a luxury. Since its conclusions are based on separate instances, it is always probabilistic. In other words, there might always be an unknown instance that would invalidate conclusions. What unities the two types of reasoning is an essential incompleteness of any inquiry, be it inductive or deductive. Hence, the long-lasting quest for perfect premises and representative samples.

The distinction between forms of reasoning reverberates through the history of Western science and philosophy. Plato vicariously denounced the world of senses as an abode of ignorance from the mouth of the much adorned guru Socrates (Allen, 2006). Objects are shadows, senses are unreliable, the world is just an illusion, and empirical observations are a lot of illiterate demos. Only ideas are real, and they reveal themselves to the worthy by means of reasoning and meditation.

Plato’s own disciple Aristotle, however, was not impressed by the obscure metaphysical ideas of his teacher. “Amicus Plato, sed magis amica veritas,”² supposedly uttered the ungrateful pupil before denouncing the ideas of his master. He adjured that the truth be sought by empirical

__________________________

² ‘Plato is my friend, but truth is a better friend’
observation and induction (Mure, 2007).

Some thousands of years later, the debates were joined by René Descartes. This respected gentleman claimed that knowledge of external world is, regrettably, beyond the grasp of empirical studies. Having nonchalantly dismissed the foundations of the inductivist position, he proceeded to state that if we “review all the actions of the intellect by means of which we are able to arrive at knowledge of things with no fear of being mistaken, we recognize only two: intuition and deduction” (Descartes, 1988, p. 19).

A choir of voices, including such luminaries as David Hume and John Locke, objected to the ideas of Descartes with fever (Hume, 1955; Locke, 1997). Purported faults of Descartes' argument are too numerous to be listed here. The principal point of these responses was that without empirical observations, deductive meditations would be completely self-referential and tautological. Ideas of Descartes and his followers came to be known as rationalism, while those of his opponents as empiricism.

With the institutionalization of science, the quest for one true way of knowing took a different guise. Newly acquired prestige made science hopelessly in vogue. Every discipline aspired to be science and every intellectual – a scientist. Henri de Saint Simon and Auguste Comte, for instance, established an enduring tradition in social philosophy, known as positivism, according to which society is subject to a set of natural laws much like the natural world. Their opponents, including Karl Marx, Max Weber, and George Simmel, controverted by pointing out that the complexity of the social world is not reducible to that of nature (Ashley & Orenstein, 2005).

Ramification of scholarship led to the confrontation spilling into various disciplines. Positivism and Interpretivism, Methodenstreit between Austrian and Historical Schools, the issue of the two cultures, and the Science Wars – all refer back to the same dichotomy between the types of logical reasoning. Century after century, in one guise or
another, we relive the same bitter rivalry that has plagued knowledge profession for ages, and we are bound to see more of this rivalry in the future.

Throwing in a pinch of much dreaded continental philosophy, the traditional animosity between the two cultures seems to suggest a mix of existential angst and inferiority complex. On one hand, there seems to be a certain degree of insecurity, engendered by inherent deficiency of the respective knowledge pursuits. Legitimization is always done through a proxy – one camp claims technological progress, while the other, humanistic refinement. On the other hand, there is carefully concealed jealousy of achievements claimed by the significant other. In a sense, only through this rivalry and opposition can the two cultures maintain their respective identities and social cohesion. An essential element for overcoming the two cultures' divide is the act of abandoning the arrogant claim to total knowledge. It is necessary to understand that no knowledge based on rules of conventional logic is essentially complete. Either we should come up with alternative logics that would mitigate this little nuisance, or learn how to live with conceptions of knowledge different from our own.

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IN 1984, IN HIS ICONIC cyberpunk epic Neuromancer, William Gibson coined the term ‘cyberspace’: “a consensual hallucination experienced daily ... Unthinkable complexity. Lines of light ranged in the nonspace of the mind, clusters and constellations of data. Like city lights, receding” (Gibson, 1984, p. 69). Although even Gibson later dismissed the term as a mere buzzword that might be evocative, but ultimately remains meaningless, cyberspace has entered not only into everyday vocabulary, but also into academic jargon. In the nineties, the early days of cyberculture studies, it would have been quite difficult to find a piece of research on the topic of computer-human interaction that did not in some way contain a reference to cyberspace. In a 1994 article, Michael Benedikt declared that cyberspace does not exist. And yet, cyberspace, or rather the possibility of its existence, is at the core of some of the most exciting debates within the field of cyberculture nowadays: digital dualism.

To put it simply, digital dualism assumes the existence of an ontological separation between a material reality and an immaterial ‘world’ sustained by the network of the world’s computers. The idea of the Internet being a kind of spectral second reality was common
enough in the early days of cyberspace studies, and it still has not been completely abandoned. In her most recent book, Alone Together (2011), Sherry Turkle maintains that the Internet is forcing people to replace ‘real conversations’ with shallow connectivity, and to privilege a ‘virtual self’ in the detriment of a natural, pretechnological subjectivity.

...Is it still worth speaking about the offline and the online as two different things?

That the Internet, as a medium of communication should evoke the presence of an incorporeal alternate universe is nothing out of the ordinary. Earlier technical media, such as the telegraph or the radio did the same: they effectively created a place in-between that could overcome time and space, which transformed human contact and let itself be populated by ‘ghosts’ (Peters, 1999, p. 138-139).

Seeing the medium as a kind of parallel universe is simply part of the history of communication (Ibid., p. 141), but this vision is now being challenged from multiple places. Digital dualism (which we might as well call the faith in cyberspace) has found some of its greatest deterrents among the writers of Cyborgology, a scholarly blog that has recently ignited an entire brouLOL (the online version of a brouhaha, obviously) on whether it is still worth speaking about the offline and the online as two different things. Over the past few years, the Cyborgology collective has made it their goal to establish a solid theory of digital dualism – not only because an alternative framework is sorely needed within cyberculture studies, but so as to highlight the ways in which it falls short of describing how people experience and conceptualize the digital medium.

The young authors who regularly write for the blog have approached the question of digital dualism from points of view as varied as ontology, ethics, aesthetics and even affect theory. Their main argument is deceptively
smooth: the online medium is not in any way similar to a virtual reality separated from the physical world. But the main problem with the theory of digital dualism is not that any self-respecting scholar might believe that the Internet is akin to a science-fictional alternate universe. Rather, the distinction comes from “the everyday ontology of regular folks” (Vial, 2013). And in some ways, the everyday ontology is not devoid of an empirical basis: the digital medium functions according to its specific set of rules: it creates new languages, codes of conduct, potentialities for identity construction which do not exist in ‘physical reality’.

On the other hand, the person sitting in front of a computer is an embodied subject produced in conjunction with their cultural, social, political, and material milieu. In short, it is becoming rather difficult to either completely accept the online/offline distinction, or to completely reject it. So is there any philosophical or practical use in even discussing digital dualism at all? I am not suggesting that we should lock the concept of digital dualism away in a box, together with its critique. However, the anti-
digital dualist argument as articulated on the Cyborgology blog is not yet able to account for why people experience a difference between the digital and the physical, and the variation in the ways in which they experience it. Part of the answer might be found in new materialist media theory and media archaeology – areas of research which specifically deal with the cultural and material history of technologies and media of communication, and focus on human and nonhuman connections and processes of interaction.

But first, a brief historical context on digital dualism. The cyberculture scholarship of the past two and a half decades is too rich, complex and varied to be condensed in a nutshell. But if one is to distill the most extreme strands of digital dualism that haunt a considerable part of it, it would go something like this: when the Internet user sits down in front of a computer screen, they enter a virtual space by becoming disembodied; the interface screen is a portal through which a new self emerges. The material body
of the user might still be sitting comfortably in a chair, but the self wanders freely though the mental geography of a realm of pure information. The net was seen as a prosthesis, an extension of our physical bodies (Stone, 1996, p. 100), or as another space which, granted, functions on the basis of the same metaphors as the real space. What much cyberspace and cyberfeminist scholarship had in common was, in short, the idea that there are two sides of reality, the offline and the online, which interact in various ways, and yet are divergent. And despite the fact that only the most naïve utopianism of cynical dystopianism would have said that the offline and the online have nothing to do with each other, the binary of offline vs. online, material vs. immaterial, artificial vs. natural was still maintained in theory in order to explain how humans related to technologies of communication. And it is precisely this distinction that the Cyborgology authors are attempting to dissolve.

In 2011, one of the founders of the blog, Nathan Jurgenson, published a short post detailing his apprehension over the continued use of 'online' and 'offline' as opposite principles, and suggested that thinking though a concept of 'augmented reality' could lead to more productive ways of looking at the cultural, social, political and philosophical implications of the Internet (Jurgenson, 2011). Instead of drawing a boundary between the digital and the physical, atoms and bits, real and digital, augmented reality sees these elements as always already enmeshed. Over the past two years, the theory of augmented reality has developed in increments through the contributions of other young scholars, most of whom were enthusiastic about the possibility of coming up with a theory that erases binaries and adds a new materialist twist to cyberspace studies. In his most recent post on the topic, Jurgenson further discusses the assumptions underlying the digital/real binary. Ontologically, what we call the ‘real’ and digital spheres have different properties, yet they interact, and this is a stance that almost everyone, academics or not, can get behind (Jurgenson, 2013). However, making a stark distinction between the two leads to statements along the lines of ‘Internet friendships are
less authentic than real-life ones’. What is at stake within this sort of discussion is not the fact that the digital and the ‘real’ are different spheres, but that they are talked about as if they were different, and one unavoidably ends up being privileged over the other (Jurgenson, 2013).

Nicholas Carr argues that the online/offline binary is reflective of a tension between people’s online and offline experiences...

The issue of digital dualism is quite interesting in itself, but it is made truly fascinating by the passion with which many still defend it. In February 2013, Pulitzer prize finalist Nicholas Carr, a writer whose main interest lies in technology and culture, published a scathing critique of augmented reality (or digital dualism denialism, as he called it) on his personal blog. In fact, precisely this piece was the starting point of a deluge of discussions on the Cyborgology blog and elsewhere, now jokingly called the ‘Great Dualism Debates’. In his piece titled “Digital Dualism Denialism”, Carr argues that the online/offline binary is reflective of a tension between people's online and offline experiences, caused by the fact that the digital is in the process of “eroding their sense of the real” (Carr, 2013). The real, in Carr's conception, means 'the natural', a nature that is pregiven and pretechnological: “Wilderness existed before society gave us the idea of wilderness. Offline existed before online gave us the idea of offline.” In the end, digital dualism is not only a question of ontology or of privileging one half of the binary over the other – it is a question of whether something natural (or perhaps more than that, something 'human') is lost when cyberspace enters the equation. Carr’s contention does not relate only to the denial of the separation between the real and the digital, but also to the fear that the digital is somehow ‘denaturalizing’ human ways of living and of knowing. In an
earlier article, he laments that computers are making people incapable of deep reading and therefore deep thinking, which used to be stimulated by print media (Carr, 2008). Digital dualist thinking makes it possible not only to dissociate an 'authentic' reality from a less authentic virtuality, but also to set apart people who are biased towards one or the other.

It seems like the question of digital dualism will be a hot topic for a while yet, and I am far from being able to offer any kind of resolution to the question. However, I would like to illustrate some ways in which neomaterialist media theories such as Jussi Parikka’s brand of mediality can potentially lead to a way to avoid the binaries that come into play in digital dualism. New materialism’s theoretical underpinnings posit the world as made up of more than mere representations or discourse, but as a “network of concrete, material, physical and physiological apparatuses and their interconnections” (Parikka, 2010). Parikka, as well as Eugene Thacker, favour a Deleuze-inspired theoretical stance that encourage the replacement of demarcations with such concepts as flows, intensities, affects, milieus, networks, viral becomings and temporalities.

The idea of time is intimately interlinked with digital dualism, and better yet, with digital communication technologies more broadly. The most glaringly obvious way in which perceptions of time are shifted in a digitally enabled medium is through the immediacy of the information transmission. But time figures in other ways in the debate on digital dualism, and one of them is framed in historical terms. The offline/online divide is a product of the internet age – supposedly it did not exist before the Internet was created. So one way to get down to the roots of the ontological conflict between the offline and the online is to erase the conflict entirely, and take a media archaeological approach in Jussi Parikka’s style. Parikka describes media archaeology as a method that owes much to Foucault’s archaeology of knowledge, and Friedrich Kittler’s mediatic spin on it. In short, media archaeology allows...
the “rethinking of the temporal structures of newness and opening up, through a variety of historical apparatuses, the question of what is new and how we should incorporate historical knowledge into thinking about current and future events” (Parikka, 2012, p. 11). Internet technologies and the imaginary geographies associated with them can be therefore seen within a stream of innovation that also incorporates older techniques and technologies going as far back as the invention of writing, for example. This does not mean to say that the Internet is the newest and therefore best iteration of a linear hierarchy of media, but merely that it is a mode of hearing, seeing and sensing in general (in Siegfried Zielinski’s terms) that demands a non-linear, nonhegemonic temporality. One does not speak of books, art, photography, telephony or cinema as divorced from reality: they are part of reality, and are a mode of experiencing it. And yet, when discussing media, touching upon issues of immersion, virtuality and interaction is inevitable. But virtuality does not necessarily demand a separation of what is virtual and what is physical, of the online and the offline, as both are ways of experiencing that don’t require a different way of existing: the experience of the technical medium is most certainly different from experiencing a print book, for example, but both the computer and the book exist within the same material reality.

Another theory that might prove interesting for the framing of the Great Dualism Debates (as the debate sparked by Carr’s piece came to be jokingly called) comes from the work of Jussi Parikka again, but can be encountered in the work of Eugene Thacker as well. Parikka draws several of his insights from the ethological work of biologist Jakob von Uexküll. Following Uexküll, Parikka proposes a vision of media as ecology, as a web of intensities, affects and forces in which the subject and the object become practically indistinguishable. In this context, one cannot look at the Internet without taking into consideration its material bases, and the relationalities that constitute it. For Parikka, media is “assembled of various bodies
interacting, of intensive relations ... as an assemblage of various forces, from human potential to technological interactions and powers to economic forces at play, experimental aesthetic forces, conceptual philosophical modulations” (Parikka, 2010, p. xxvi). This sort of reasoning avoids altogether the question of the ontological difference between offline and online, which can no longer be seen as distinct and bounded, and are instead linked by streams and flows of affect, of organic and nonorganic material, and other forces. The media ecological approach offers an alternative to the problem of cyberspace being seen as parallel universe or a common mental geography (which, granted, are notions that have been previously critiqued by theorists such as Michael Benedikt), but it can also be used to explain why there is even a need to talk about experiencing the online and the offline in different ways.

The fact that some users might experience the online and the offline as distinct, or that they might feel a certain tension between the two is not necessarily a convincing argument for the denial of digital dualism, as Carr would have it. When it comes to the perception of the digital medium, or the affects that come into being in relation with it, Uexküll's ethology is again a useful lens of analysis. According to Uexküll, it is impossible to speak of a unitary space and time for all beings, and what we have instead is a variety of perceptual worlds, which are nonetheless linked together (as cited in Agamben, 2004, p. 40). In other words, one way to see the Internet is as an assemblage of material and immaterial, human and nonhuman flows, a space of potentials to which each user relates in different ways, none of which is privileged.

It seems like contemporary neomaterialist theorists concerned with the issues raised by digital technologies have a marked preference for a ‘fluid’ language, one that describes the world through flows, intensities, energies and potentials. The sort of flexibility and openness to relationality
that Parikka and Thacker confer to mediums and networks point towards the centrality of affect in connection with technical mediums, even when affect is not explicitly among the terms of discussion. Digital dualism, at least in the version of Turkle or Carr, is more concerned with effects rather than affect, which on the one hand fails to grasp the nonlinearity and somewhat cyclical nature of the history and philosophy of technology, while on the other hand ignores the fact that digital communication involves more than simply two actors: the human and the technological. I will not go in detail into why and how affect theory can be useful for media studies¹, but it is worth mentioning that its use in media archaeology is quite pervasive and very useful for pointing out why it is worth excavating the past in order to understand the present. For example, John Durham Peters (1999) looks at the affectivity of the telegraph in the 19th century, which not only transformed the conditions for human contact and produced a “revolution in both space binding and time binding” (p. 138), but was also imagined as a means of junction with other bodies and with immaterial entities (p. 147). It is the distribution of affect across human and nonhuman actors, as Richard Grusin put it (2010, p. 91) that forms the core focus of much media archaeological work – and looking at digital media from this perspective can definitely add to the existing theoretical framework.

Digital communication involves more than simply two actors: the human and the technological...

However, it shows that perhaps simply debating whether the online and the offline are different and how they are different is not enough - from the point of view of theorizing the web it is perhaps more productive to reveal how to conceptualize them in such a way that the mere possibility of separating them becomes fruitless. The above bite-sized snippets of theory are not intended to provide an exhaustive framework, nor to settle the matter of digital dualism, but as a potentially valuable entry point. Digital dualism does not care about the materiality of the medium, its intricacies, and the way in which it affects and can be affected by human and nonhuman actors. It would be unjust to characterize digital dualist theories as based on mere binary reductions, and many of them offer sophisticated and compelling arguments why the offline and the online should be kept separated. But however seductive it might be to imagine that media can create a “dwelling place of ghosts” (as John Durham Peters puts it), the symbiotic and synergetic approach to technology offered by media archaeology is just as captivating – I, for one, am completely seduced.

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THE SYNESTHETIC SCIENTIST:

The Induction of Sense-Mixing to Open New Frontiers in the Laboratory

*Emily Daina Šaras*

The answer is clear: we cannot discover it from the inside...we need a dream-world in order to discover the features of the real world we think we inhabit (and which may actually be just another dream-world).


AS THE SCIENTIFIC WORLD and its associated worldview have emerged over the past few centuries, many scientific methodologies have been inarguably dominated by the action of visual observation for purposes of accumulating both qualitative and quantitative data. Within this scientific world, the objectivity of human ocular observation is often taken for granted, and Jonathan Crary (1988) describes the action of seeing, however scientifically trained, as necessarily subjective. Limited by one’s own biologically and socially defined humanly body, which serves as the primary machine for data reception, vision transforms, from a “privileged form of knowing,” into an “object of knowledge, of observation” (Crary, 1988, p.5). Just as Paul Feyerabend calls for new methodologies that utilize a “new conceptual system that suspends, or clashes with, the most carefully established observational results” (1992, p.22), methods can be developed by researchers to deconstruct, advance, and multiply the very sensory capabilities that currently limit their laboratory work.

Such a practice would allow scientists to escape some of the bias of their own sense-monitoring - or, at least reach into a realm beyond the subjective-objective dichotomy.
Vision is understood to be the most disinterested sense – but how could it be, if a human body and mind moves the eyeballs to observe what she wants to see?

One hypothetical method for circumventing the visually-dominated human sense hierarchy during research is the chemical or technological induction of a synesthetic-like sensory state within laboratory experimentation. Synesthesia, the rarely-occurring natural phenomena of sense mixing within the human perceptive system, transcends the traditional five separate senses as they have been historically defined. This phenomenon mirrors the actuality of the Homo sapiens organism as a perceptive whole without the nurturing cultural training that teaches it to sensorially operate as human. In the body, the senses do not operate in isolation, and they often work in tandem with one another to gather and process mixed sensory data. Though easier said than done, employing assisted or induced synesthesia and encouraging researchers who naturally experience sense-mixing to incorporate it within their work answers Feyarabend’s call for a “dream-world” which counters that which humans inhabit and believe they experience, and may lead to the discovery of new ways to capture data within, and not separate from, the realm of human corporeal sensation. Through the imposition of an involuntarily-mixed sensory experience which transcends the boundaries of separate senses and their corresponding socially-reified “sense organs,” the practice of synesthesia induction would allow for new laboratory methodologies that break the subjective-objective binary to occur through, and within, a human researcher’s body.

A new approach to “sensing” in the laboratory is necessary now more than ever: for centuries, what has been visually observed in the laboratory has faced little disputation on the grounds of ‘biased vision,’ especially if the gazes of other human researchers have confirmed the
results obtained through the first set of eyes. During the 18th century, during which the methodology of scientific inquiry was first established, the visual sense was often understood as the most useful, objective, and unbiased sense modality in human five-sense typological system. Michel Foucault explained that vision was then understood as “a perceptible knowledge” that countered the subjective understandings of vision that were proposed by previous scholars, including Immanuel Kant and William Blake (Crary, 1988, p.5). As the scientific method has thus far depended on the primacy of the visual to structure laboratory techniques, the social construction of gaze, never mind the entire traditional Aristotelian five-sense typological system of perception itself, has been conveniently ignored by the scientific community (Hellner-Roazen, 2009, p.163; Keeley, 2002, p.8). Although vision is treated for error, it is rarely treated for penchant or proclivity within scientific literature, and little consideration is given for how the socially-mediated practice of observing introduces additional layers of subjectivity into the scientific method. Historians of science Lorraine Daston and Peter Galison define objectivity in the sciences as “blind sight, seeing without inference, interpretation, or intelligence” (2010, p.17), and explain that the eyes are ascribed with the ability to operate impartially, separately from the human mind.

Vision is understood to be the most disinterested sense – but how could it be, if a human body and mind moves the eyeballs to observe what she wants to see? On one hand, vision is imagined as the most passive and receptive sense, yet on the other hand it is ascribed the most power and agency. Even material that is invisible or imperceptible can be visualized for the purposes of both experiment and explanation (Otegem, 2005, p.620; Singy, 2006). Optical devices and technologies that played an important part within the early history of science, such as microscopes, the camera obscura, and telescopes, together “spawned a new mass visual culture in the nineteenth century [which] are inseparable from the new normative sciences of the observer and the seeing body” (Crary, 1988,
The visual sense is an expert in the act of persuading the mind, and serves as a talented summarizer that can generalize from infinite visual cues (Gordin, 2011, p.137-140). The idealization of the visual sense as both omniscient and objective obscures the subjectivity of humans who perform the act of seeing. Escaping the visually-dominated frame of scientific knowledge production would allow for the exploration of new directions in the scientific tradition, yet such an abdication would be constrained by a long historical and cross-cultural tradition of ascribing objectivity to sight, positioning it at the top of the sense hierarchy.

The researcher enters the cancer biology laboratory. She prepares her body to test a hypothesis through an established methodology. She cloaks herself in a colorless white coat and snaps thin latex gloves over her fingers for both her protection and tactile pleasure. To prevent injury to her eyes, and in subservience to her eyes’ objective approach, she shields them from chemicals with clear glass lenses. She slides her gaze from the plastic dishes where she grows the cancerous cells to a nearby beaker, from which she eyeballs a measurement of modified Ringer’s solution, a sweet-and-salty liquid, using a pipette calibrated by human hands. She coordinates the movements between her eyes and hands as she splashes liquid onto the dish for the cells to consume. She confirms that her cells, invisible to the naked eye, still live in amounts she has previously predicted: she counts them under a microscope as they consume the imperceptible molecules of sugar. The researcher controls, manipulates, and selectively reports on the eye’s scientific vision as she works in the laboratory with these microscopic, metastasizing murderers. She sees the qualities of living and inanimate objects that she has been trained to look for, as she has been trained by the academy to observe.

If we understand that “objectivity is the suppression of some aspect of the self” (Daston & Gallison, 2010, p.36), we can assume that additional unexplored laboratory potential is suppressed as well by aiming for objective scientific work. Only
through one’s body, through oneself, can a human researcher come to know about the world. The “lived body” encapsulates “both an objective subject and a subjective object” (Sobchack, 2004, p.15), and perhaps our trained use of these bodies prevents diversity and multiplicity from arising in our perceptive abilities. Sensory perception is a necessary laboratory tool, and there are myriad modalities through which the natural world – the very subject of scientific study – is perceived by living beings. Through the random and adaptive processes of evolution, different creatures have acquired various systems of organs, tissues, nerves, and neurons that are able to process qualitative and quantitative aspects of the surrounding environment. Within the embodied machinery that has developed through non-directional and purposeless evolutionary mechanisms, no organ or system has been designed to fulfill a particular function, and the collected sensory data “spill from one sensory system into another” (Maurer & Maurer, 1998, p.164). The meshing of the sensory input occurs within such a short time-span, that data is blurred (Guterman, 2001, A17; Sobchack, 2004, p.69). Scholar of synesthesia Richard Cytowic suggests that children experience a “horizontalization” of the senses and a cross-modal perceptive experience as they are, unlike adults, not acculturated to particular methods of sensing in separate ways (Cytowic, 1993, p.95-96).

Culture has helped humans to socially construct the boundaries between senses – the biological possibilities are far less limiting.

Yet through the social construction of separate sense modalities, which each include an “appropriately wired-up sense organ that is historically dedicated to facilitating behavior with respect to an identifiable physical class of energy” (Keeley, 2002, p.6), five specific sensory systems have been imagined to operate within the human body. Such a comparison with the trans-
sensory experiences of children is not meant to suggest the search for sensory origins, but is rather suggestive of the natural indeterminacy of our bodies in sensory operation. The five sense organs, as commonly understood in cultures around the world, perceive in distinctly different ways. The eyes perceive sight, the mouth perceives taste, the ears hear, the nose smells, and the skin perceives touch – each organ uniquely perceiving singular types of data in isolation from one another. Of course, this invented typology is not universal among all of Earth’s creatures, for some species possess additional sensory capabilities such as magnetic sensory ability, echolocation, and infrared light detection (Keeley, 2002, p.10-11), and augmented or mixed-sense perceptive ranges further complicate the potential for sensation within other forms of life. The human brain, often coping with sensory overstimulation, may have adapted to partially inhibit sensory cross-talk (Stein, Wallace, & Stanford, 2005, p.711).

However, the biological brain does not necessarily parse the bits of sensory data into five separate categories; rather, it is the human consciousness and learned practice of typologizing that has led humans to believe such a process naturally occurs. Culture has helped humans to socially construct the boundaries between senses – the biological possibilities are far less limiting.

The researcher in real-time operation is impinged upon by many different waves of data: the wafting yeasty smells of cell growth and the counteracting scents of sterilizing alcohols, the various wavelengths of light and sound, and the splashing of liquid agarose as she swirls the cell plates. The vibrations of the buzzing laboratory ventilation system shake both her eardrums and her chair, tickling various types of nerve endings all over her body as she unconsciously perceives. Yet she keeps her eyes and hands steady, focuses on counting and quantifying, and returns to her laboratory notebook to complete numerical calculations. In her notebook, estimations are written as measurements, qualities become quantified, and improvisation
becomes methodology. Her documentation is visual, numerical, and objective – unlike her qualitative reality.

The senses are the primary means for humans to engage in scientific research and understand nature, yet even the scientists who use these very embodied tools have typologized them into categories that do not even necessarily reflect the actuality of their operation. Determining how the senses work, both in universal and individual terms, is impossible. The focus of scientists has historically eradicated direct engagement with the world for “essentially mediated endeavor[s]... new instruments were not to assist the human senses, but to replace them” (Gal & Chen-Morris, 2009, p.122; von Mohl, 1846; Shickore, 2001, p.137). The machine-mediated collection of “knowledge that bears no trace of the knower – knowledge unmarked by prejudice or skill, fantasy, or judgment, wishing or striving” (Daston & Galison, 2010, p.17) through objective sensory means is impossible, especially if those means are constrained by penchants for particular socially-constructed typologies and culturally-learned observational behaviors.

Implementation of a mechanism for destroying as much as possible socially-learned sensory abilities would help to reshape science and its methodologies. Inducing a form of synesthesia would be one way to help randomize and recombine multi-sensory perception, to mix the senses within the bodies of researchers and allow them to intermingle with the varied subjective lived experiences in infinite non-objective ways. Synesthetes, or those who naturally experience synesthesia, sometimes do not distinguish between different sensory aspects, so that “a stimulus in one modality can elicit an entire complex of subjective impressions in another modality” (Stein, Wallace & Stanford, 2005, p.713). Cytowic notes that synesthesia is “not some intellectualized concept pregnant with meaning,” and that it occurs through limbic processes that operate in concrete ways “more immediate than analyzing what is happening and talking about it” (1993, p.176). Clinical synesthetes experience
multi-dimensional experiences that combine any number of the five senses as well as temporal and spatial perception, and although an individual’s unique synesthetic experience cannot be controlled in terms of intensity or quality, clinicians have documented that synesthetes have instantaneous and involuntary sensory experiences when exposed to particular stimuli. The lack of physical and palpable proof, or observable manifestations, of this sense-mixing syndrome has led the medical and scientific communities to understand synesthesia as a subjective experience (Cytowic, 1993, p.24, 64). However, a synesthetic and subjective scientific experience would not be based upon a personal bias towards particular information. Subjectivity would be invoked by science’s new necessary location: an “interpretive framework” dwelling within a human body (Polanyi, 1859, p.60). Philosopher of science Thomas Kuhn explained that education of young researchers in the techniques of the laboratory is kinesthetically achieved by “imparting unarticulated skills and interpretive dispositions,” and scientific perception is a trained experimental skill that requires such training (Golanski, 1998, p.17). If paradigms, “the core of the culture of science, are transmitted and sustained just as is culture generally” (Barnes, 1985, p.89; Golanski, 1996, p.16), then scientists will need to receive new sensory education to be socialized in these new methods. Like scientific technologies of the past that have been “valued and exploited only in the context of certain hopes and expectations” (Wilson, 1995, p.71), a new hope of post-objective research will lead to new understandings of the body’s value during experimentation.

The researcher enters the laboratory, and ingests a small pill that induces a synesthetic response within the brain. A technological implant in her wrist is turned on, and her once-nervous system relaxes. In her new scientific dream-world, the data present themselves to her as clearly and truthfully as before: however, her body’s complicated system of neurological channels trained to bottleneck and pre-categorize data are inoperative. Open to receive in limitless ways,
her brain makes involuntary and instantaneous connections between the different data waves that impinge upon her body’s surfaces in ways it has never before. Or, perhaps her brain had always had made such connections, but decades of nurture had helped her to ignore them. Her notebook reads as a thickly-described Malinowskian adventure, one that she can only experience in her body, in this space. After hours of experimenting in this synesthetic state, her senses realign as they have been humanly trained to do, she unhooks, deactivates and powers down, and returns to more normative ways of seeing, sensing, and doing.

In the process of opening up the scientific field for multi-and-mixed sensory data collection, dethroning observation from its seat of objectivity could be achieved by employing a strategic new system of synesthetically sensing scientific data. Objectivity in the sciences has historically been echoed in the refrain, “let nature speak for itself,” yet little consideration in the laboratory is given to the diverse ways in which our bodies, with or without chemical or technological assistance, may be spoken to (Daston & Galison, 2012, p.120). The dichotomy of objectivity and subjectivity should be problematized in terms of sensory perception as well, and the complexity of the senses should be acknowledged – and employed – within research. Rejecting the culturally and socially imposed classification of the senses, the problematic relationship between vision and the researcher, specifically in terms of the misplacement of agency and objectivity within a primarily ocular observational method, would be rectified. Though perhaps not easily implemented at the present, a trans-sensory method of relating to the practices and environments of the lab could be designed using implantation of computer chips within the human nervous system or ingestion of substances that would be safely designed for the purpose of scientific laboratory use. Assisting in the reception of mixed sensory data does not suppose the total eradication of the boundaries between the senses entirely, nor does it suggest removal of all bias from experimentation. However, this
trans-sensory laboratory methodology allows for a transcendence of both biologically imposed and socially constructed divides between sensory methods, and would open new doors for trans-sensory laboratory research to take shape through subversion of observation within scientific experimentation.

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Fig. 1. The photograph of a dead striking miner taken during the daylight. (Tau 2012)
Fig. 2. The photograph of a dead striking miner taken several hours later. (Tau 2012)
FORENSIC SCIENCE AS A discipline covers a broad range of practices related to collection, identification, preservation and interpretation of physical evidence. Simon Cole distinguishes forensic science from what he calls the ‘conventional research sciences,’ arguing that it differs from the latter in the epistemological principles it employs in several respects (p.39). Unlike the open-ended, temporarily unlimited conventional scientific inquiry, forensic science rarely leaves room for revision and follow up research; instead it aims at establishing the ‘truth’ within the period of the legal proceedings of a case (Cole, p. 39). The scope of inquiry in forensic science is also rather limited, since it does not have the ambition of producing generalizable knowledge about the natural world; it is a ‘science of the particular’ that generates very specific knowledge claims, spatially and temporally bounded and pertaining to a particular case, just like the source data it deals with (Shapin cited in Cole, p.39). Since the data forensic experts deal with is inherently limited, the outcomes of forensic expertise can rarely be verified through the common scientific methods of knowledge validation like reproducibility; forensic claims can sometimes be checked through repeatability, but almost never reproduced. This methodological constraint puts additional pressure on the tedious process of data collec-
tion and preservation that has to be carried out in accordance with very strict regulations to secure the objectivity of forensic science. This paper will explore one of such practices – the application of forensic photography to the documentation of a crime scene and will examine the construction of the concept of photographic truth that serves to validate the data used for production of forensic claims and thus ensures the objectivity of forensic science. Using a semiotic approach to the study of an image, the article will discuss the double nature of a photograph that represents both an automatic reproduction of reality and a reflection of an author’s subjective vision of it, and it will attempt to raise some questions regarding the legitimacy of photography as an objective method.

**IMAGE AND ARGUMENT**

To understand how and why photography came to have such a prominent position in forensic science and became viewed by many as “medium of truth and unassailable accuracy” (Guilshan quoted in Porter, “A New Theoretical Framework Regarding the Application and Reliability of Photographic Evidence,” p.42), it might be worthwhile looking at the history of imagery usage in the Western scientific tradition. The ideas of what an image stands for when used in an academic context have evolved over time. Analyzing the change in the relational nexus between the text and image in the medical academic tradition of the early modern period, Matthijs van Otegem identifies a shift from the scholastic tradition of usage of highly realistic images that served exclusively as illustrations for the text to the alternative mode of application emerging in the seventeenth century that involved a schematic image that “tells its own story” and in itself constitutes an argument to which a text serves as a supplementary explanation (van Otegem, p.610). Van Otegem conceptualizes this transition as a shift of cognitive paradigm “from cognition as perception to cognition as comprehension” (p.614). Photography that allows grasping parts of objective reality with their finest details, in a sense, reverses this shift: it presents to us not an argument or expression of an author’s idea, but reality itself,
thus reifying modern scientists’ long nurtured dream of objectivity. Produced through the mediation of a mechanical instrument – the camera – photography makes a certain claim on objectivity (Porter, p.22) and gives a promise of liberation from “authorial control of meaning” (W. Mitchell, p.28).

It is this potential for objective and accurate representation of reality that makes photography a precious tool for evidence collection and preservation in forensics. The systematic application of photography for the documentation of a crime scene and preservation of forensic evidence was crucial for the establishment of forensic science as a field (Baden cited in Porter, “A New Theoretical Framework Regarding the Application and Reliability of Photographic Evidence,” p.39). The major concern of criminologists working at a crime scene is similar to that of scientists performing an experiment – to keep the data uncontaminated, which means to eliminate completely any possibility of the researcher’s intentional (or unintentional) intervention (Das ton & Galison, p.123). The image of a crime scene investigator popularized by numerous TV shows – always wearing gloves and protective clothing, seeking to minimize if not exterminate completely his physical (and also emotional) contact with the field, helps to establish the illusion of objectivity of ‘uncompromised’ forensic evidence presented in courts. This is precisely the ideal of objectivity photography came to embody – mechanical objectivity, based on production of data through an execution of a certain algorithm, leaving no room for the author’s intervention and human subjectivity. Photography becomes not just the method of preserving evidence, but also of checking its reliability and the ‘purity’ of the crime scene.

The painful awareness that the source data forensic science works with has higher probability of being tempered with comes back every once in a while in the form of a public scandal provoked by the uncovered contradictions between the pieces of evidence presented in court, as it happened during the investigation of the Marikana miners’ strike case in South Africa. On August 16, 2012, in course of a violent confrontation with the local police forces around thirty-four strikers have
been shot dead. The crime scene pictures presented in the court revealed a large amount of contradictory evidence, suggesting that the crime scene could have been manipulated.

Thus, Figures 1 and 2 (PULSE p.54) present the images of the same body taken by the law enforcement specialists at the crime scene several hours apart; the pictures document the appearance of an ‘alien’ object at the scene – a yellow-handled panga placed under the arm of a dead body, that is clearly missing at the first photograph that has been taken earlier (Tau).

This type of public debates reflects concerns about the reliability of the data obtained at the crime scene, while the accuracy and objectivity of photography itself as a mediator of the evidence, whether actual or forged, remains unquestionable. Daston and Galison point out that this type of public debates reflects that awareness of the photography’s double nature (its ability to function both as a reflection of objective reality and as a subjective vision of a photographer) has been around and build conclusions (Porter, “A New Theoretical Framework Regarding the Application and ever since the invention of photography, and poured into infinite debates on whether photography pertains to the field of art or to that of technology (p.133). However, the scientists in their endless quest for objective and judgment-free representation that can stand for reality itself never abandoned their dream of a perfect, ‘pure’ image (Daston & Galison, p.139).

THE OBJECTIVITY EFFECT
Building on Jacobson’s analysis of realism effect in art, Mitchell argues that it is due to the photographs’ extraordinary contiguity with the objects they portray that they come to be seen not as pictures but “as formulae that metonymically evoke fragments of reality” (W. Mitchell, p.27). The goal of forensic photography is to deliver evidence to the court members who do not visit and investigate the crime scene themselves; therefore to them forensic photography is the substitute for reality: they use it as ‘pure’ data from which they can draw inferences.
forensic photographs is supposed to be secured by the systematization and unification of practices of visual images production, which are generated in strict conformity with the protocol. Crime scene investigators have an elaborated standardized system of visually documenting the scene that conditions how many shots and from what viewpoint and range these should be taken (Porter, “A New Theoretical Framework Regarding the Application and Reliability of Photographic Evidence,” p.45). Figure 3 demonstrates how a series of shots taken from different range help to situate the position of fingerprints found at a crime scene and bind them together into a coherent visual narrative.

Ironically, the very practice that was meant to become the guarantor of objectivity of forensic photography, and help it escape the tyranny of the author’s subjectivity and primacy of idea, made it most susceptible to it, through establishing canonical principles for a new genre, and thus endowing the form of the pictures taken already with a pre-existing meaning, and with semantic connotations and associations.

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Fig. 3. Crime scene photographs using a visual narrative to illustrate the location of the fingerprints (Porter 2011)
Visual narratives, just like any other narratives, inadvertently prompt interpretation and push the viewers to seek meaning, and not any type of meaning but the one that was ‘put’ there by the author (Sontag cited in Porter, “A New Theoretical Framework Regarding the Application and Reliability of Photographic Evidence,” p.45).

The fact that an expert chose to photograph a particular object already reflects this expert’s reading of the object or situation in a particular way...

Application of unified methodological practices to the production of images might have succeeded in limiting the human intervention and thus decreasing the level of subjectivity in forensic photography to a certain extent, but it was never able to eliminate the ideational component existing prior to the image and inherent to any photography. Not only are forensic photographs read and interpreted in the context of forensic culture and its taxonomical categories, but they are produced in accordance with its cannons. The fact that an expert chose to photograph a particular object already reflects this expert’s reading of the object or situation in a particular way, his recognition of it as a case of something; the forensic images are never self-referential, but always function in a larger system of meaning determined by forensic culture. Thus, the photographic documentation of a crime scene in forensics that is meant to represent an accurate perception of objective reality simultaneously reflects a certain comprehension and conceptualization of a particular situation (Porter, “A New Theoretical Framework Regarding the Application and Reliability of Photographic Evidence,” p.45). Arranged into a narrative, forensic photographic images possess both denotative and connotative components that stand both for the objective reality they mirror, and for the photographer’s subjective comprehension and assessment of this reality, that he or she frames in a certain way as representing a case of something (Barthes cited in Proper, “Visual Culture
in Forensic Science," p.82). Images and the reality they represent are never fully identical or mutually substitutable; forensic photographs are not ‘pure’ data to be analyzed and interpreted, for the very fact that they are framed as such already implies a certain reading of the reality they claim to represent, the form itself can be an expression of the author’s evaluative attitude to reality (Bakhtin, p.84).

**RECOVERING THE SUBJECT**

In nineteenth century scientific practice, photography was used not only as a technique of documenting objective reality, but also as a means of scientific discovery, as a way of making “visible phenomena otherwise invisible to the human eye” (Daston & Galison, p.126). In a sense, forensic photography has preserved this function as well: even though it does not always necessarily help us transgress the limits of human vision, it helps bringing into focus what otherwise could escape our attention and remain unnoticed, and in this way uncover something important about the case. However, very often this discovery is already ‘put’ into a picture, the photograph is taken not to reveal something, but because a certain fragment of reality is judged by an expert as revealing something. Any image is the result of a photographer’s decision that a particular moment or scene is worth being documented and displayed (Berger in W. Mitchell, p.20). Porter argues that “a fundamental function of crime scene investigation is for the forensic investigator to bring and articulate aspects of the crime scene to a court,” which opens a new space for the transmission of the expert’s subjectivity (“A New Theoretical Framework Regarding the Application and Reliability of Photographic Evidence,” p.39).

In a sense, a forensic expert plays a role similar to that of an exhibition guide: he might not have arranged the crime scene himself, but he directed the public perception of it, arranging the sequence in which the public encounters images, accentuating certain elements and foreshadowing whatever he deems unworthy of attention. Every crime scene image is framed and presented in such a way as to match the representation of what a crime scene is,
that the court experts and the legal system audience share, and thus, to evoke a structure that exists prior to it, to convey a larger truth that is there to be discovered (T. Mitchell, p.101). Truthfulness and objectivity of forensic photography is based on its conformity with what Barthes called ‘doxa’ – shared conventional and commonsensical expectations and representations (Barthes cited in Moriarty, p.159). This fragility of balance between subjectivity and objectivity in forensic photography and the impossibility of drawing a clear line between the two is symptomatic of forensic science’s inability to escape abstraction. Something that was meant to become the inductive science of the particular, to operate only within the strictly set boundaries of specific cases, ended up producing a set of categorical generalizations that eventually became a basis for the assessment of other cases. This is where the individual and the collective merge and the abstracted, averaged out, archetypal image of a murderer (thief, robber) emerges (Galton cited in Daston & Galison, p.169). Such archetypal images lie at the heart of how the legal system constructs, determines and recognizes the cases of murder, assault, robbery, or fraud; hence, forensic photographs never simply represent themselves, but inevitably allude to one of the aforementioned categories.

CONCLUDING REMARKS
Unlike the conventional research science that produces knowledge for the broader scientific community that can test, assess, criticize and eventually accept or reject its claim, forensic knowledge is produced with a specific audience in mind – the criminal justice system. This audience often lacks necessary training in the logic of scientific inquiry and method to be able to assess critically the validity of the claims made; moreover, unlike the scientific community, this audience does not always adhere to the principle of organized skepticism and tends to unquestionably accept and ascribe a lot of credibility to the evidence presented (Cole, p.40). Since many of the participants of the legal system are not trained scientists, and their judgment is largely based on their commonsense representations, the persuasion factor
becomes even more central to forensic science than the probation (Barthes cited in Moriarty, p.159). Crime scene photographs presented in court as evidence not only play on the jury’s commonsense ideas of what is scientific and what is objective, but also evoke the categories constructed by the legal system in the way they are staged. In this way forensic science produces a sort of self-contained truth: it creates a set of postulates and one’s compatibility with those postulates becomes the sign (and proof) of one’s culpability (Barthes cited in Moriarty, p.159). While forensic science legitimizes the legal system by acting as a guarantor of its objectivity and validity, the legal system becomes the ultimate source for the validations of forensic claims.

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MEDICALIZATION IN A BIOPOLITICAL FRAMEWORK
MEDICALIZATION OF MASTURBATION TRAVELS EAST:

A Serbian Case Study
Ljiljana Pantović

Masturbation is the universal secret shared by everyone but disclosed to no one.

IN THE HISTORY OF western societies, the social and moral condemnation of the act of masturbation can be traced. From the Judeo-Christian theological perspective, it is regarded as a sin: the biblical version advances the story of Onan spilling his seed as a refusal of levirate - to father his dead brother’s child. Thus, the problem with masturbation was the destruction and waste of the male seed. It was in fact viewed not only as a sin, but as a crime against nature. It was presented as an unnatural sexual act that was shameful and deserving of divine punishment, as it did not have as its goal to procreate, to conceive, but was oriented towards pure enjoyment of sexual pleasure (Vidal, 2004). For fear of punishment, masturbation was, as the quote above would suggest, treated as a secret.

With the rise of medicine and medical authority from the Renaissance onwards, until the 18th and 19th centuries, however, masturbation started being seen as a pathology, as a disease. This did not mean that the previous moral and theological understandings were replaced. On the contrary, they were even more emphatically justified. Treating masturbation as a disease provided proof that it was a sin. “Scientific rationality does not replace religious or moral injunctions, but joins them in a novel fashion” (Vidal, 2004, p.274).
From the Renaissance, Western culture had begun to develop a new technique for internalizing social norms regarding morality and sexual behavior (Foucault, 1987). These claims are connected with the idea of confessions, as a new form of truth production (Foucault, 1987). In other words, sexuality was made to speak. Masturbation, when viewed as a disease, became something that needed to be confessed to the doctor for fear of worsening one's condition or for fear of death. It could no longer be kept a secret.

The literature on the medicalization of masturbation has been mostly limited to the study of the rise of this phenomenon in Western Europe and the United States. In this paper I will expand this theoretical framework east and present the case study of a publication on anti-masturbation from an Eastern European country, Serbia, from the end of the 19th century and the beginning of the 20th century. The reason for looking at a non-western case study is to question to what extent the theoretical framework for understanding the medicalization in the west is applicable to examples from the east. In this paper I will look at the example of the nineteenth century Serbian physician Đoko Jovanović's book, How our student dies. Onanism (Jovanović, 1890). This publication was apparently very popular, having three editions come out - the first edition in 1890, the second in 1912, and the last in 1922. The author, Doctor Jovanović, was a prominent doctor who taught medicine at the Great School in Belgrade (which would later become the University of Belgrade).

Following the theoretical framework provided by the study of western examples, I shall try, by placing this publication in its specific geopolitical context, and by comparing it to the western examples, to answer the question of the social, cultural and political context in which this book was written and why then. In this paper I will show that this publication emerges in times of great political upheaval in the Balkans when the questions of national borders and the processes of nation
building were happening. On this background, focusing on the physical bodies of specific individuals (male students) meant situating these unrests in the realm of medicine. If the cause of the problem was medical (masturbation), then the solution to the nation's tensions and troubles would reside in changing the habits of these young men, disciplining them in order to achieve stability as a nation.

The circulation of semen in the body was seen as healthy...

WESTERN EUROPEAN AND AMERICAN FRAMEWORK
From the late 18th century, Foucault argues, we can start tracing a rupture in the previous regimes of power, the sovereign power, to a new form of power regime that had arisen in the modern era, and that had as its main concern the body (Foucault, 1990). In this new power regime, life itself became the object of power. This new form of power Foucault called biopower - a form of power arisen in the modern era that is interested in the intimate relations of social subjects with their own bodies, and with the body of the entire population. The rise of scientific practices, such as statistics, had as its goal to create the norm of a (healthy) population. Medicine and doctors were seen as caretakers of the health not only of individual bodies, but of the entire population. They became the arbiters of what was healthy and what was not, and thus they were the ones with authority to bring masturbation out of the seclusion and secrecy of sin. They possessed the medical gaze that would allow them to see on the male body the symptoms of masturbation. The (male) body itself was made to confess because on it the physician read the evidence of masturbation. The “evidence” that was read on the body could vary depending on the social and cultural context. “Masturbation is a kind of polyvalent causality ... to which doctors in the 18th century will immediately attach the entire arsenal of physical, nervous and psychiatric illnesses” (Foucault, 2003, p.59-60).

“The culmination and transformation of the understanding
of masturbation from sin to disease in Western Europe occurred with the publishing of Tissot’s book *Onanism* in 1760” (Stolberg, 2011, p.169). In his book, Tissot, a Swiss doctor, connected masturbation with the new medical paradigm of nerves, “the central explanatory model of disease in the 18 century” (Stolberg, 2011, p.170). The nerves were understood to be “more or less thick strings running through the body” (Stolberg, 2011, p.177). In this logic of the nerves, circulation of the semen in the body was seen as healthy. This circulation happened through nerves. “They connected the human body with the soul” (Vidal, 2004, p.256) and this was seen as a natural process. The lack of these circulating fluids was seen as the cause of disease and eventually death.

Yet masturbation was not perceived as a disease that came from nature, in fact it was seen as counter-natural. Tissot claimed that it was the urban dwellers more than the people who lived in villages that were afflicted with this disease (Vidal, 2004). In Tissot’s view masturbation was the disease of too much free time and imagination, the disease of the rising bourgeoisie.

The medicalization of masturbation meant that it could stand in the place of larger socio-cultural and political values and norms. Stolberg explained that the rise in popularity of anti-masturbation campaigns in England occurred at the time of the rise of Protestantism. That is, the viewing of masturbation as a disease fit in nicely with the desires for hygiene and marriage of the Protestant faith in the 18th century (Stolberg, 2011). In the United States, during the 19th century, anti-masturbation campaigns became popular right after the Civil War and around political tensions surrounding slavery (Castronovo, 2001). Castronovo writes about this shift of discourse from the slavery of black men to the more democratic slavery of man to himself, slavery to masturbation. Having suffered this shift in focus, slavery became ahistorical and depoliticized. The male body was seen as the embodiment of the desired aspiration of the
nation. If this body is sick, then so is the nation (Castronovo, 2001).

**The Example of Serbia: An Eastern European Framework**

The first edition of Jovanović’s publication came out at the end of the 19th century in 1890 and had two subsequent reprints, in 1912 and in 1922. Because of the scope of this research I will only focus on the first two editions as they both take place within the Kingdom of Serbia, while the last one was published in the Kingdom of Yugoslavia which would require a much more detailed analysis.

In order to understand the significance of these dates for Serbia and to place the book in its historical time-frame, I shall first place it in the larger theoretical framework regarding the study of the medicalization of masturbation. Second, I shall present a short geo-political history of Serbia that relates to the period of the first two editions - the period after Serbia’s independence from the Ottoman Empire to the beginning of WWI.

Jovanović’s book addresses not just the health of the individual, but of the entire population of Serbia. He starts off with demographics, stating that although the country has a high birth rate, the life expectancy is 22 years. “From this simple fact it is plain to see how deadly this is to our family and our country” (Jovanović, 1890). By “this” he is referring to masturbation, which he sees as one of the three main illnesses in Serbia, causing what he called the exhaustion of the nerves. This means that he too, like Tissot, was explaining masturbation through the paradigm of the nerves. In his book, he represents masturbation as a disease that affects the young men of Serbia, and denies the possibility of women being afflicted, because in his view “they are passive in the love act” (Jovanović, 1890). His target audience is male school boys, aged 12-17. They are portrayed as weak, coughing blood, easily distracted, pale and of a general “sad physiognomy” (Jovanović, 1890). All of this, in Jovanović’s opinion, was due to lack of semen in their circulations.

*Today the seed is considered the noblest gift that nature has given a male organism. In the seed lies tremendous power that gives the*
From this quotation we can infer that Jovanović's understanding of good health rests on the paradigm of the nerves. He views the healthy male body as one in which there is a circulation of the seed throughout the body, and if this is stopped or lost, there results sickness, or worse even, the loss of manhood. The point behind such a gendered framing was to distinguish what kinds of sexual behaviors were deemed as acceptable and which were not. In order to highlight the importance of adhering to social norms of sexual behavior, Jovanović follows the same pattern that can be seen in Western publications. He provides narratives, stories of patients that he has witnessed suffering from masturbation. The role of these confessional stories is twofold. On one side, they are used to establish his credibility and authority as a physician who just by looking at the patient knows that he is a masturbator. On the other side, these stories are a type of “medico-moral strategy” (Vidal, 2004, 268) that has been used in these types of publications to invoke a moral judgment and repulsion of the reader towards the represented patients and reinforce the values and norms that distinguish accepted from unaccepted sexual behavior.

One of these examples is the case of a boy who lived in the village and started becoming sick - coughing blood, growing weak and doing poorly in school. The point Jovanović wanted to make with this particular story was to show that the disease was not limited to the urban areas, but was widespread in Serbian villages as well. This is a different understanding of the illness of masturbation than the one in Western Europe that was considered a disease of the civilized, urban bourgeoisie. The reason I bring this example here is the fact that he presented this young man not only as a masturbator but as a homosexual, calling his homosexuality a “perversion” (Jovanović, 1890). In the story, the patient also confesses that he has never slept with a
woman, but during the breaks when he was in the village he would “chase chickens, turkeys and fillies to perform this strange urge” (Jovanović, 1890).

The underlining point of this story is to shock the reader and to present a strong distinction between acceptable sexual practices and unacceptable ones. Even though these were all social norms, the authority of the medical expert made the unacceptable acts not only forbidden but deadly as well. In this we can see the shift that occurred in the 18th and 19th century with regards to the question of authority, though the norms and values themselves did not change as much. “At the time when religious arguments lost their influence on contemporary society, medicine provided a new justification for traditional forms of acceptable sexual behavior and sexual moderation” (Stolberg, 2011, p.212). In this sense, the logic of the publication from Serbia can be read as similar to the logic of the previous publication in the West. It is even highly likely that Jovanović, given that he was well versed in the fashionable medical paradigm of the nerves, could have read the works of Tissot and others, and fashioned his book to resemble Tissot’s. The question that needs to be asked, though, is why this publication came out when it did, that is, what were the socio-cultural and political events that set the background for this discourse on sexuality?

In the beginning of the 19th century Serbia as an independent country did not exist, it was divided amongst the Ottoman Empire and the Austro-Hungarian Empire. From 1860, the part of Serbia that was under the Ottoman Empire gained some autonomy by becoming a dukedom within the empire. It was only after the rebellion and war against the Empire that Serbia became a Kingdom in 1882. It is in this period that the Serbian education system emerged. The same year that the country was proclaimed a monarchy, the Serbian Great School was established in Belgrade, paving the way for the creation of the first University. All of the teachers and all of the learned individuals of Serbia before that had gotten their education in Central and Western Europe: Budapest, Vienna and Paris (Mitrović, 2007).
Unlike other monarchies, Serbian monarchs did not come from a long lineage of nobility. The two competing royal families, the Obrenović and the Karadorđević, both stem from the leaders of the two rebellions against the Ottoman Empire. On coming to power, King Peter I Karadorđević had to tackle the mounting debt and corruption that was left behind by his predecessor as well as growing political tensions with both Austro-Hungarian Empire (over Bosnia and Herzegovina) on one side, and the residing Ottoman powers on the other. From 1912 until 1913, the Balkans were shaken by two wars. These wars were seen as a prelude to the First World War that started after the assassination of Franz Ferdinand in Sarajevo, Bosnia in 1914 (Mitrović, 2007).

I suggest that the reason why the discourse on masturbation arose at that time, and why its target were young men, was because of the fears related to the formation of the new nation state. The question of masturbation was not only seen as a self-inflicting disease that harms the individual but that harms the person’s family and, most importantly, the nation, for as Jovanović wrote, “Killing yourself, you are killing the country” (1890).

The issues of “public health arose in the period of the creation of the nation state” (Peling, 1997, p.276). This is true for this case study as well, because the first publication came out only a couple of years after Serbia’s independence from the Ottoman Empire, the second during the Balkan Wars which were also about the questions of borders and state formation, and even the last edition in 1922 was riddled with internal nationalistic and ethnic disputes in Yugoslavia. For this reason, it is important to understand what type of nation-formation process was taking place during the time of the first edition of the book. The biggest difference between western and eastern representations of masturbation was in the approach to intellectualism. In Vidal’s analysis of Tissot’s work “too much intellectual work is an obstacle” (Vidal, 2004, p.260) and a cause for masturbation, given that the “gens de lettres” have too much time on their hands and let their
imaginations run wild. Jovanović, on the other hand, sees masturbation as the cause for poor intellectual achievements. His primary concern is with the prospering, future Serbian intellectuals, the ones that are supposed to build the nation.

There is a living connection between the brain and the sexual organs, and the more one masturbates the stupider he becomes. It makes him into an idiot and a moron. Yet equally it is idiots and morons that masturbate the most (Jovanović, 1890).

At stake was an issue far greater than the liberties that young men were taking with their bodies: for if the physical body provided a template for the republic, did the spectacle of sexually degraded white men also suggest the collective body's lack of political virtue? (Castronovo 2001, 63).

As Castronovo pointed out, the issue was not just that masturbation, as a disease, was affecting physical bodies, it was that it was harming specific types of bodies. Male bodies, as the bodies of desired citizens, are seen as the creators and pillars of the nation. The issue was that it was expected to be reciprocal, that is to say, that the nation depended on its citizens and depended on them to behave in a certain way “because it (the country) rightly expects ... help with its endeavors” (Jovanović, 1890).

Focusing on the bodies of young men allowed not only for a tighter control of sexuality, as I have mentioned above, by
creating ideal norms of sexual behavior in opposition to socially perceived deviant expressions of sexuality. Thus, this book can be read from a Foucauldian perspective as a form of biopower, the power to dictate what a healthy sexuality should look like. In this sense, sexuality and sexual behavior can be seen as a crucial identity marker. By creating a definite opposite to desired sexual behavior, such as masturbation – as a form of deviancy from the norm – biopower is asserted on and through the body of the individual, creating disciplined and docile bodies of citizens (Foucault, 1987).

The physical body of the young Serbian students embodied the political turbulences and crisis of the times when there were growing uncertainties with respect to the stability of the independence gained through revolution and war. With these political and economic tensions, the discourse about the actual physical body of the citizens is read as the cause and the cure for the growing political issues. Shifting from the real body politic to the actual bodies allows for questions and problems concerning the everyday lives of the citizens to move from their historically and politically situated context to the ahistorical, a contextual universal sphere of illness and health.

CONCLUSION
To conclude, by placing Đoko Jovanović’s book How our student dies. Onanism (Jovanović, 1890) in both a specific geopolitical and larger theoretical context, it can be stated that this specific discourse of medicalization of masturbation was used to change the focus of growing anxieties over the problematic nation-state formation going on at the time, from the economic and political causes to the realm of the medical, that is presenting the afflictions and troubles of the nation as a disease that attacked the bodies of young men, which disabled their mental capacities and created problems for the entire nation. The cure for the nation’s problems was not seen in politics and economics but in medicine. This is by no means a unique usage of anti-
masturbation campaigns for this purpose. As Castronovo pointed out, a similar usage was documented in the United States after the Civil War when slavery was questioned.

What is different between this case and the previously studied cases from the West is the understanding of the cause of masturbation. As Vidal pointed out, in the Western countries masturbation was seen as a disease of civilization – of too much intellectual stimulus, exclusive to the urban population. In the Serbian case, in contrast, it was widespread in both rural and urban areas and it was caused by lack of intellectual stimuli and masturbation itself hampered intellect and memory of the afflicted. This was a problem not just for the individuals themselves but for the entire process of nation building, if understood from a Gellnerian perspective of the importance of the intellectual elite in the process of the formation of the nation.

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INTRODUCTION
The advent of the internet in 1994 produced an effect similar to the invention of the printing press. It has impacted our interactions in most every form, creating new relations, words, myths, and communities. In this way, then, one can see how many social interactions have become virtual, with large swathes of people in the U.S. and Europe having daily access to a multiplicity of forms of connections to the internet.

Most of these networked communication acts revolve around the issues of our lives and our health. Our experience of the world is mediated through the use of our bodies, so it is no surprise that people are concerned with how their bodies work, and more often with how they do not work. Much like ‘scientists’ of previous centuries, and currently as well, there is an obsessive desire not merely to know, but to categorize, label, and store within the vast archives of human knowledge. With the internet, what was once the reserve of specialists and scientists, has become the domain of the masses. In other words, as Paul Rabinow suggests, “we are partially moving away from the older face-to-face surveillance of individuals and groups...” and, with the internet, “individuals sharing certain traits or sets of traits can be grouped together in a way that...decontextualizes
them from their social environment…” (Rabinow, p.242-243). Building on this, Nikolas Rose states that doctors have “lost the monopoly of the diagnostic gaze”, and that “the maintenance of the healthy body has become central to the self-management of many individuals…” (Rose, p.10-11). This paper, then, will take a brief look at the way that this shift has occurred in relation to medical websites and the way that these are used and taken up by individuals, specifically looking at the case of diabetes.

THE INTERNET, MD
Much as the internet has changed our relation to news media (Karioris & Hamilton, 2013), so too has it changed our relation to medicine, and thusly the way that individuals relate to their own bodies as well. The overt distancing of individuals from their bodies has been the primary processional, professionalized oeuvre of the medical field since its inception. In this way, the medical field has pushed people away from their bodies; emptied out self-actualized conceptions of the body for a distant stasis that is determined outside of the body as a substantive and general-izable conception (Foucault, 1976).

The internet, with its radical potential, bringing media to the masses, with a supposed ability to take the keys away from hierarchies, has, at the same time, opened up a space where the impacts and effects of the biopolitical state system can play out, though playing out differently (Foucault, 1990, p.140). By this it is meant that the internet which was prophesied to open the gates, has, instead, been crucial in the maintenance of the hierarchical system and reinforced the institutional biopolitical regimes. It is important though, in understanding this, to recognize the role that the internet has played and is playing in the specificity of medical discourse, and the way that this discourse has impacted upon not merely the medical profession, but upon the medicalized population who utilize these medical sites as hubs of information and spaces which simultaneously blur and recreate epistemological boundaries. Through this process, the individuals willfully subsumes themselves to the self-dis-
ciplining regime. In other words one sees this as a constitutive act of agentic subscription to a model of neoliberalism, this act instigating their involvement rather than requiring a measure of force.

It is crucial to understand this a bit further, and in reference to what Foucault calls an “anatomo-politics of the human body” (Foucault, 1990, p.139). It is through this that the body is brought not only into politics, but more broadly speaking into the public sphere of discussion and influence. The internet has, in part, challenged the heterodoxy of a medical profession, but it has also simultaneously reinvigorated it. Foucault, in his Birth of the Clinic (1976), investigated the way that medical perception impacted and created the patient in situ of a predetermined and disposed patient-being. Foucault says that “for clinical experience to become possible as a form of knowledge... a new definition of the status of the patient in society, and the establishment of a certain relationship between public assistance and medical experience, between help and knowledge, became necessary” (1976, p.196). Further, it was “necessary to open up language to a whole new domain: that of a perpetual and objectively based correlation of the visible and the expressible” (1976, p.196). Through this establishment of a relationship between patient and the medical field, it consecrated an objective and objectivized sense of self, granting dominion of body to supposed specialists.

The expressive component the internet grants to individuals is a semiotic opening from which to gain a stronger grasp upon linguistic regimens, and for, to borrow a phrase from Barthes, this signifying media of mass communication to allocate a powered character to words and the notion of expertise (Barthes, 1973). It is the naming through a matrix of created intelligibility which situates a praxis that makes invisible the individual while putting forward the ‘patient’. Through this, one sees the patient not necessarily taking back control of the medical patient, but of the patient being treated to examination through a mediated form of mass display. This mass
examination is part of the process of examination itself, which puts forward a vizibilized patient, whether through the process of self-examination or through the patient chart a doctor fills out. Through self-examination, which occurs in the remediation of one’s person through the artifice of the undifferentiation of the anonymous, which distances individuals from themselves as well as the process, one recognizes the role of the internet as a method of self-constitution that reaffirms a negation of selfhood for a sense of the impersonal. In other words, one can see the switch to self-medicalizing as a process of self-policing of bodies which eliminates not the control of the medical institutions, but the degree of necessity for explicit prescriptive measures.

In addition to a biopolitical dimension, one can see the medical field at the same time as a situated doxic institution within the broader social field. The medicalized body provides an inscriptive hexis through which a habitus is actuated and by this means further obfuscating the learned sense self (Bourdieu, 1990, p.66-79; Bourdieu, 1977, p.164-171). Through this re-obscurong of knowledge production and bodied engravings, one sees not the radical revolutionary force of the weapons of the weak, but the entrenched power of the system which compels the complicitous involvement of the individual in their own constrained body. It is a redeployment of power through an absorption of the radical inherent in power, and the internet as a product and mechanism of power structures. This, then, speaks to the inclusion of radicalism, and revolutionary potential, as a part of the system of power which necessitates a revolutionary as immanent within it.

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1 For Bourdieu, habitus are the “systems of durable, transposable dispositions, structuring [and structured] structures...” (Bourdieu, 1977, p.72). They are both predisposing as well as being generative. In a similar sense, hexis are the bodily and embodied habitus; whereas doxa are the unquestioned, unchallenged beliefs. Together, in combination with an idea of the field and a system of capital(s), Bourdieu puts forward a way of understanding the learned and situated processes which determine and position the self within a broader context.
THE CASE OF DIABETES
Diabetes is a disease with profoundly widespread sufferers, and which comes in a variety of shapes and forms, each of which carries its own specific time-line and treatment plan. It is, for many of those diagnosed with the disease, something which is survivable, but which requires various medical prescriptions. What is also crucial to any treatment of diabetes is that it requires not just medicine, but also a specific set of life-choice from any individual, including most prominently a particular dietary lifestyle. It is here, in the interstice between medically prescribed interventions and the personal regimens of dietary maintenance, that one can further grasp the profundity of this particular case.

Through a brief investigation of websites which address diabetes (the American Diabetes Association [ADA], WebMD, National Center for Complementary and Alternative Medicine, and Diabetes Mine), a number of items become clear in the representations. All of the images portray smiling pictures of patients and families working with doctors and nurses, wishing to showcase that any information that is needed by the patient or their family will be on the website and will allow them to come to grips with this issue. There is also, throughout the pages, a utilization of what might be termed ‘everyday language,’ rather than a version of writing reliant on specialized knowledge which excludes patients from knowledge and from understanding. In this way, this seeks to present the patient information on their terms rather than those of the medical profession. ADA’s website,² at first glance, seems to cover almost every single piece of information that can be found about diabetes.

The medicalized body provides an inscriptive hexis through which a habitus is actuated and by this means further obfuscating the learned sense of self...

² http://www.diabetes.org/
Along with ‘happiness’ promoting visuals and the simplistic language that is used, this website is very organized and looks almost like a newspaper website that is dedicated only to news on diabetes. What is striking about this website is that the information not only includes medical advice, medical details about diabetes, but also about how to integrate the condition into your lifestyle. Furthermore, there are food recipes, advice on eating healthily and even book reviews on diabetes and eating habits.

WebMD.com is a medical website with extensive information about almost any disease, condition or disorder. The diabetes section has its place in the list of most common diseases on the left-hand side of the homepage. Clicking on the section “Diabetes”, you go inside a world of lists, how-to guides/tips, top 10s and so on. One cannot help but do a “personalized health report”, which asks general questions about your body, like your weight, height, your medical history, etc. At the end of the test, you get two different documents: a report for you (the patient) and a report for your doctor, listing everything about you, your body, and medical predictions.

After looking at two different web sources that focus on Western medicine, it would be appropriate to explore some of the alternative medicine sources that are available on the web. The National Center for Complementary and Alternative Medicine Website gives viewers important information just like the other ones that I have explored. The NCCAM web site offers a lot more scientific definitions and terminology than other web sources. For instance, it explains all the dietary supplements in detail, including scientific explanations. It is also important to point out that, although NCCAM website offers many significant bits of information and advice, one of the first few sentences is as follows: “It is very important not to replace conventional medical therapy for diabetes with an unproven CAM therapy.” It is repeated many times in the website that, “It is not intended to substitute for the medical expertise and
advice of your primary health care provider” (NCCAM Web source).

The last web source that can be looked at is a blog particularly for people who have diabetes: Diabetes Mine. A non-official site, Diabetes Mine’s motto is, “A gold mine of straight talk and encouragement for people living with diabetes.” Indeed, reading some of the people’s blog entries, it seems like social interaction and a helpful source for people who had no option but to choose a lifestyle according to diabetes. It includes many sections that are on products, food, doctors, personal stories and so on. Diabetes Mine is a virtual social community that brings the patients of diabetes together through an online network, that helps them share, give thoughts, stories and eventually make an encouraging bond among each other that can somehow alleviate the strains that they go through, providing a form of psychological support and moral sustenance.

Through these websites it becomes clear that the internet has allowed an expansion of self-medicalizing behavior, much of which, while taken from the vantage point of the patient, does not stray far from the paradigmatic approach of the medical establishment. The incorporation of personalized medical regimes of individuals into the prescriptive routine allows for an expansion of the medical discourse rather than any supposed diminishing of power; it is the fluidity of power which allows it to work through various channels and find the crack to flow through.

**PRESCRIPTIONS & CONCLUSIONS**

This article has sought, in a similar fashion to Ljiljana Pantović’s discussion on masturbation (Pantović, 2013), to understand and explore the boundaries of a medical discourse, which seeks to distance individuals from their bodies. Pantović’s exploration tackles the pathologizing effects which the medical discussion on masturbation had in Serbia. This article, in its own fashion, aimed to see rather the way that the medical discourse, as it has had to address and work with changes in internet media forms, has found ways of working through individual’s own medicalizing, combining a
formative biopolitical regime with doxic beliefs cemented in and through a process of cultural epistemological hegemony.

It is through this combination of systems of biopower, with an understanding of the medical doxa, that one can begin to see the powerful force being transmitted through the utilization of the internet as prescriptive proscribing of a means of self-medicalized instrumentalization. As such, one can see the sublimation of the utilization of the internet for the purposes of the system. Nikolas Rose states, in relation to the medical internet, that they “pluralize biological and biomedical truth, introduce doubt and controversy, and relocate science in the fields of experience, politics, and capitalism” (Rose, p.142). While I agree with him that science has relocated, I think it is crucial to see the pluralization and introduction of doubt as problematic. Rose, continuing, says that the response by the medical field has been to “actively engage themselves with the self-education of active biological citizens” (Ibid.). It is this which this article reached out to gain an insight into.

One sees that lives are medicalized, even in the virtual world, every day, with every interaction. It is not to suggest that this was not true prior to the prominence of the internet as a media form, but to say that though the biopolitically regimented doxic environment might have changed in quality, it has not changed in kind. Though changes have occurred, one can still see that the “gaze directed upon the individual and the language of descriptions should rest upon the stable, visible, legible basis of death” (Foucault, 1976, p.196).

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GENDER, SEXUALITY, SCIENCE
Smiles at least at last. Frank Karioris, 2013.
THE DESIRE TO DISCOVER GAY BRAINS

Neuroscience after the HIV/AIDS Crisis
Chris Zivalich

Generally speaking, the complex way in which sexual practices, identities, and political movements are discursively and socially linked is irreducible to neat divisions and categorizations. However, a fascinating location of sexuality's meanings sits at its intersection with science. More specifically, science and popular culture in the past few years have co-produced salient concepts of sexuality as a prenatally inherited predisposition.1 Consequently, recent investigations behind the biological meaning of sexual orientation in the United States have been robustly funded by various institutions. Such manifold relationships remain analytically rich due to a dense, heightened moment of meaning.

In this article, I attempt to locate the way in which male “gayness” has been explained, studied, and politically legitimized within neuroscience, after the HIV/AIDS crisis of the 1980s, as a

1 In this way, I am referring to the “Born This Way” song popularized by musician Lady Gaga, which captured a moment for LGBT sexual identity politics in which the notion of sexuality being innate rather than “chosen” formulated as a response to and effect of homophobic religious and conservative discourses that emphasized the unnaturalness of homosexuality. “Born This Way” has become a recent anthem of sorts, both directly sung and tacitly used as an argument within sexual citizenship discourses.
difference in the brain. Drawing on the influential and hotly contested work of Thomas Kuhn (1962/1970) and his notion of the incommensurability of scientific paradigms, coupled with the important work of biologist-feminist Anne Fausto-Sterling (2000) and new materialist feminist scholarship, I argue that “male gay brain” politics is made possible through specific assumptions about gender, the central nervous system, and the desire to pathologize sexual behavior. Using the work of Simon LeVay, I also demonstrate the extent to which the harsh reality of homophobia during HIV/AIDS discourses at the end of the 1980s contributed to the possibility and specificity of “male gay brain” research.

To frame my discussion, I turn to Kuhn's controversial book *The Structure of Scientific Revolutions* (1962/1970), which has been interpreted diversely by historians, philosophers, and scientists. Jan Golinski (2012) notes in his analysis of Kuhn's work, that by highlighting the historical situatedness of scientific paradigms, Kuhn “calls into question any assertions that presuppose the unity of science across time and space or its singularity as a cultural phenomenon” (Mauskopf & Schmaltz, p.25). In other words, his work sheds light on science as a way of thinking particular to a historical moment. Gay brains as a scientific paradigm and concept are thus, to borrow from Foucault (1978), specific to an articultability constrained by discursive regimes and genealogies of thought; “gay brains” are a paradigm of the moment2.

**HIV/AIDS**

As such, the desire to locate a biological meaning behind gayness emerged in a particular way after the HIV/AIDS crisis of the 1980s (the reality of HIV/AIDS as a systematic problem in the U.S. today notwithstanding). Simon LeVay, a British-American neuroscientist, completed work in

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2 This is also not to say that “gay brains” are un-thinkable entirely in other moments of history. I do not believe in absolute, clear demarcation of paradigmatic chronologies. That being said, I emphasize that the gay brains of now (meaning from the end of HIV/AIDS in the 1980s to today), have particularities that are worth highlighting, evaluating, and situating.
1991 on “gay brains” predicated on his location as a historical subject. An article in New York Magazine by David France (2007), entitled “The Science of Gaydar,” describes how LeVay began research on gayness and the hypothalamus (a small portion of the brain with bundles of nuclei) after his partner died from complications due to AIDS. As France explains, it was AIDS that gave LeVay the opportunity to dissect dead bodies to see if gay men’s brains differentiated from those of straight men.

France writes that “before the epidemic, cadavers available for dissecting came with scant personal background besides age and cause of death. But because AIDS was still largely a gay disease, it was possible for the first time to do detailed neuroanatomical studies on the bodies of known gay men” (p.3-4). LeVay (1996) admits in his book Queer Science that AIDS may have influenced the particular brains he dissected due to multiple factors, such as affinities for receptive sexual roles that were more conducive to contracting HIV and medications that could have altered the hypothalamus (see Chapter Six, “The Brain,” p.129-148). Still, gay men’s brains became thinkable as dissectible experiments as an effect of the material and cultural consequences of HIV/AIDS. The accessible bodies of dead gay men vilified by homophobic discourses and concomitantly ignored by the U.S. government, which failed to provide adequate funding and research during most of the 1980s (Crimp, 1987 & 2003), produced the conditions under which LeVay’s experiments became possible and politically useful as a way to verify and validate homosexuality’s nature.

MALE/FEMALE
Beyond this, LeVay’s assumptions about gender and ‘biological sex’ significantly influenced his work. LeVay’s dissection of men who died from AIDS-related complications was based on the notion that the hypothalamus differs in men and women, and that a cell cluster called INAH$_3$ in the hypothalamus is twice as large in men. Relying on similar logic, he concluded (albeit with a great deal of caution) that the men with AIDS had an INAH$_3$ comparable to straight women, and accordingly, smaller than
straight men (France, 2007, p.3-4). Furthermore, LeVay correlated the hormonal saturation of the hypothalamus to sexual behavior, which, as he described it, is partially “generated” by the INAH3 (LeVay, 2000).

In order for such articulations to make sense, however, we have to examine the extent to which LeVay at the time assumed a coherence in gender, sexual difference, hormones, and sexual behavior as corresponding facts—something Fausto-Sterling debunks compellingly in Sexing the Body (2000), where she argues that many of the conclusions about the supposed differences between male and female brains presuppose men and women as different in the first place, profoundly shaping the way experiments on the hypothalamus are conducted, including what scientists are looking for in the already 'known' male or female brain (see Chapter 5 “Sexing the Brain,” p.115-145). Moreover, she insightfully notes that other important factors, such as frequency of sex and diet, affect the hypothalamus, and, echoing Cordelia Fine’s (2010) work on “neurosexism” in Delusions of Gender, challenges whether hormones can be referred to as a “cause” of sexual behavior given the complexity and multiplicity of their effects throughout the entire human body (Fausto-Sterling, 2000, p.307). Thus, because of LeVay’s reliance on notions about sexual dimorphism in human brains and the hormonal origins of sexual behavior, his comparison of gay men’s brains to straight women’s relied on an epistemology that veiled and undermined certain assumptions (including the all-too-ready connection between bodies that are culturally prescribed as collectively feminine, i.e. presumably straight women and gay men).

NATURE/NURTURE
Next, I would like to look at new materialist feminism to understand the extent to which assumptions about biology and the brain shaped LeVay’s interest in neuroscience as the means by which sexuality might be explained—something I argue must take place beyond his assertion that “since neuroscience was my work, that just seemed like the way to go”
As Joan Scott (1991) reminds us, the evidence of our experiences with which we cite and explain our own histories is discursively produced; it cannot be neutral or external to social production.

We must see experiments on gay brains ... as historical moments that partially explain the changing and shifting directions of science.

Helpfully, in relation to the “why neuroscience question,” new materialist feminism, which attempts to explain materiality as a force of agency that interacts with humans, also critiques the propensity to value biology or social construction as the one-and-only cause of human behavior. As Samantha Frost (2011) notes, biology is welcomed, not discarded, within new materialist feminism and re-conceptualized “in terms of reductionism” rather than “terms of misattribution” (p.80). Essentially, new materialist feminists challenge the nature/nurture binary by refusing to analyze materiality or socialization in a way that privileges one or the other as the ultimate cause of what people do, including sexually.

Therefore, new materialist feminist theories can, in part, answer why LeVay was interested in neuroscience and finding clusters of cells in the brain to explain gayness, even if he recognized the complexity of his work, its limitations, and the fact that it did not “prove” gays were “born that way,” as he noted in an 1994 interview (quoted in Nimmons, p.1). For example, Elizabeth Wilson (2004) examines the enteric nervous system (ENS) and argues that because the central nervous system (CNS) is privileged as the cause of our feelings, emotions, and affective responses, we ignore the fact that there are as many neurons in our intestines as there are in our brain. She argues that the ENS may be equally involved in producing what we feel, how it relates to our memory, and the way in which gendered power dynamics affect our everyday living (see Chapter 2, “The Brain in the Gut,” p.31-48). In short, she demonstrates that we
privilege the brain as the all-encompassing body part from which our desires, thoughts, and feeling derive.

Coupling Frost with Wilson, the conditions under which LeVay decided to look at gay men’s brains can be understood as a project inspired by culturally embedded meanings about the brain, the biological body, and their sexual implications on human decision-making, identity formation, and subjectivity. By operating within discursive logics that centralize brains, LeVay was able to predeterminedly accept the brain as the central origin of sexual behavior and accordingly, focused on small clusters of cells within it in order to understand why certain male bodies engaging in certain sexual acts were dying, and perhaps to counter the fact that they were also being hated. The brain’s symbolic weight of causation enables it to become a potential means by which sexual practices, like that of gay men, could be legitimized.

As I conclude, I want to emphasize that sexuality’s morphological manifestations are integral to understanding our sexual behavior, practices, and identities. Indeed, biology, materialities, and what is often lumped together as “nature,” do play significant roles in shaping what we do with our bodies, but it is perceiving this inter-implicated relationship as biological purity that I find problematic. We must see experiments on gay brains, or gay genes, gay hair whorls, and gay facial expressions (all well-funded projects under work at various institutions of higher education) as historical moments that partially explain the changing and shifting directions of science. However, such processes must not be parochially framed as the “reality” about sexuality. In the end, we can remember that scientific paradigms, echoing Kuhn, will always be embedded within discursive and historical conditions that are significant and shape the way in which things like a “gay brain” become desirable projects imbued with intelligible meaning.

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From the bottom up. Frank Karioris, 2013.
BEGINNINGS

In many societies, there is the notion that one is not born as a man, nor, as de Bouvoir says of women, does one become one. There is, then, a supreme sense that one rather is made into a man. This process of ‘making’ a man can take the form in any number of different ways, only one of which will this article look at or address. As the title suggests, the paper at hand will begin by investigating the way masculinity is codified, specifically looking at the vast array of recent handbooks and guides which set out not only qualities of a man, or prescriptions, but also a science for such, and a science for how to become and be made into a man. In these it sees a way of trying to solidify a masculinity rather than understanding a version of masculinity.

It views these books as devices not merely to re-establish some fictive notion of masculinity, but also to codify the discourse of masculinity under the guise of science; seeking such is a way to acquire the guise of respectability that the scientific community, for some, holds. This article will briefly look at Robert Bly’s Iron John story as an example, and exemplar of these guidebooks. While this article does not attempt to investigate the scientific community directly, it sets its aims at the unifying, and universalizing, elements of the
attempt at creating a version of masculinity.

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**SCIENCE AS METHOD**

It is too easy to cloister the idea of science into its maintenance as a discipline, forgetting that it stretches out beyond these borders through the creation of othering, leaving those outside its grasp as deficient and lacking. As the supposed ‘Scientific Revolution’ blossomed, this process took on strength, treating ‘traditional forms of discovering and validating knowledge as worthless and that they “ought to be discredited and swept away. Through this, the nature of ‘old’ philosophies was often caricatured as to misrepresent their complexity and sophistication” (Shapin, p. 65-66).

The erasure of philosophy as a credible intellectual and academic pursuit occurred simultaneously with the supposed advent of science showcases its modus operandi: “[the method of science] is relentless. It never stops” (Figlio, p.7).

While the history and sociology of science has eminently tackled the fact that science is, itself, supposed as masculine,¹ the imagining beyond this into the application of science as rather a method onto, or upon, masculinity is what this paper will seek to investigate. As such, in its use of the word ‘science’, this paper means to indicate it as method rather than a discipline specifically. Part of this method includes the search for not merely knowledge, but a generalization or universalizability. In seeking out generalizations it seeks to establish rules and usable categories. Beyond this, the drive “to make knowledge as an on-going social practice” is specific to science, in both its disciplinary and methodological modes (Figlio, p.7).

In Foucault’s *The Birth of the Clinic*, he states that the “science of man”, taking its cues from the “science of life,” had turned from a holistic view of health into one of “the normal and the pathological” (Foucault, p.7).

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1976, p.35-36). In other words, there is implicit in a view of science understood thusly through this binary whereupon one is not merely not something, but is deviant from it. Through this, one can see the codification of masculinity as both an explicit way of putting forward a singular empirical notion as well as castrating as deviant that which strays from it. Through this, one can see the codification of masculinity as both an explicit way of putting forward a singular empirical notion as well as castrating as deviant that which strays from it.

It is too easy to cloister the idea of science into its maintenance as a discipline, forgetting that it stretches out beyond these borders...

MASCULINE CODIFICATIONS
The categories have been created and fortified, put into the deep recesses of a (supposed) shared spirit of humanity. In describing the social situation at the beginning of the 20th century, when Freud came onto the scene, Peter Gay recounts the trend of “subjectivity increasingly [becoming] scientific” (Gay, p.xxi). Though the 21st century has found any number of committed minds and philosophies that have fought against this entrenched scientificity, it has also found champions at every turn.

In this light one can begin to see the vast variety of manuals, handbooks, guides, and compendiums on how to become a ‘man’ as a fabrication of masculinity; as constructing not merely an “art of manliness” (McKay & McKay) as one book is called, but, rather, as seemingly desirous to perpetuate and assemble a science of masculinity. While these books vary in how gender progressive or regressive they are, they are, in their purpose, pushing to set up ordered rules that explicitly see that which falls within it as ‘normal’; and, in so doing, create a discourse which is premised upon the notion of singularity rather than of multiplicity.² Though some of these discourses move outwards...

² The acceptance of some deviation from a singular, does not equate to an acceptance of pluralism, it merely means that it sees a multiplicity to that which is accepted under the same rubric or framework, rather than accepting a plurality of frameworks.
from an (overt) essentialism, the scientificity of it remains.

These handbooks seek to observe elements of empiricism, objectivity, as well as universality in different measures. In this way they rely on scientific claims as well as claims of naturalness, which converge in beliefs about the sexes and the scientific basis for these. This all said, it should be rather obvious when understanding that this all, while non-academic, and does not situate itself in literature or the humanities, fits itself under the umbrella of the social sciences. Implicit in the naming is an attachment to the conception of science, and a struggle to gain the equity, and symbolic capital, which is given to science as both a method and a discipline. One could aim the spotlight at many others who, in a similar fashion, are determined to fixate on a fixed conception of masculinity.

**MAN OF SCIENCE, MAN OF NATURE**

In one of its most essentialist and universalized incarnations, one can look to Robert Bly’s *Iron John* and not only the creation of a singular, but also the emphasis on the naturalness of this, which he ties not merely to spirituality, but also to a ‘warrior DNA’ inside each man (Bly, p.150). In calling upon DNA, Bly aims to create a nature of masculinity from within a certain science of the body - which is “alive in our genetic structure” (Bly, p.36). Bly furthers his connection to science through the subtle inflection and use of the phrase ‘soft male’; indicting this supposed version of man for his softness in comparison to both a rugged manliness, and possibly to the idea of ‘hard sciences’ versus the ‘soft sciences’. *Iron John* is a parable story that utilizes a varied set of myths and stories to connect a fairy tale vision with the modern man. It is a blend of psychology, mythology, poetry, and morals that is meant to be particularly inspirational and insightful to men in the 20th Century. Its publication in 1990 worked to strengthen the burgeoning ‘men’s movement’, better known as the mythopoetic movement.

Even as Bly calls out for a way to create a unified vision of masculinity, he simultaneously claims it as individualistic (Bly,
It is here where ideas of a science of masculinity run headlong into the individualist of modern America. In the paradox of a universal singular individual, one can see the figure of Bly’s Iron John standing in as not the individual self or subject, but as a mythic figure abstracting the individuals from themselves while simultaneously allowing them access to themselves. Bly sets man then as both an attainable inner self and as an unattainable object removed from them. Coming back here to Foucault, one can say that in this way it creates a deviant, set up as both internal and external, which in that way then becomes part of the creation of the subject himself in the process of subjugation and that functions to seek as a further normalizing effect in the constitution of this image of masculinity (Foucault, 1982, p.781). This production of a deviant establishes in its wake a criminalized set of qualifiers, most frequently in the form of a homophobic discourse. Through the essentializing subject creation, hetero-sexuality is seen not merely as a sexuality, but the sexuality of men.

In setting out this manual, then, Bly is creating a discourse which is similar in kind to Foucault’s vision of the confession: a form of power and knowledge which is bound externally and which seeks to control the idea of truth (Beneke). This then, like social sciences in Foucault, is built upon a series of norm-alizations which attempt to “explain away any anomalies of human nature” and which serve the function of power and institutions (Beneke, p.153). A stable category of masculinity in this way puts forward then not just a science for masculinity, and a normalizing disciplinary tool for men, but also cements further the binary, in Western societies, of the feminine as the negative lens to masculinity that is pushed further outwards and downwards. Bly aims to connect modern (American) man with a masculinity that has been at the bottom of the ‘male psyche’ for “twenty thousand years” (Bly, p.230). What he fails to understand, in part, is the connection between his notions of ‘deep masculinity’ with industrialized Western society and the purposing of the individual within the larger structures that situate the subject.
In drawing this to a close, it seems important to talk about origins. Karl Figlio, in his book Psychoanalysis, Science and Masculinity, says that “Man instantiates a unique situation: the very idea of originality, of being the origin, and therefore the idea of novelty” (Figlio, p.8). Much like this notion of beginnings, one can see many of these guidebooks on masculinity reaching into a past that never existed and creating an origin story that both suits their needs, and speaks to a masculinity which can be biologized through the utilization of a scientific methodology which sees the science it uses as self-evident proof. In a literal sense though, these guidebooks, and Bly’s Iron John specifically, put forward an origin myth meant to signify naturalness and universality that puts it beyond question. It claims it is the root, the singular, the source. In a sense it aims to establish itself as part of the natural sciences, part of the empirical, established discourse that guides life.

Attempts at a science of masculinity are not new, they have merely taken new form, shape, and gained a renewed vigor. One could, as these handbooks do, point to a supposed ‘crisis’ in masculinity, but it is crucial to see the crack running through masculinity itself, and the fact that it is created in such a way as to perpetuate crisis. With a masculinity premised on crisis, it is no wonder that these handbooks find an audience. Men’s interest in these guides is not, like their authors would have you believe, due to a weakened ‘soft man’ which is in need of instruction and reappraisal by empirical examination; rather these discourses are part of a larger process situated inside science and masculinity that preserves and sustains a rigid normative which creates a deviant in its wake, defining the Subject only in light of the Object.

In his Autobiographical Study, Freud quotes a line from Goethe, which goes: “In vain you roam around scientifically/ Everyone learns only what he can learn” (Freud, p.4). There is certainly a sense of this feeling running through this article. What emerges though is a recognition of the ways that an attempt is made to constitute masculinity through scientific measures as a means to
legitimacy through utilization of a discourse that situates itself on the border between ‘nature’ and ‘science’. In doing so it attempts at destabilizing one singular vision of masculinity for another.

Stephen Vizinczey wrote that “As a rule, the most dangerous ideas are not the ones that divide people but those on which they agree” (Vizinczey, p.105). While these various handbooks disagree about many things, they all agree on the notion of a masculinity which can be constituted through a set of rules and regulations and which finds its explanation, definition, and approval in what amounts to scientific essentialism. What is truly disconcerting is the agreement that this scientized masculinity has in the wider society, and the ramifications of this for men and women.

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Manta Alexandra Claudia

[...] our science is at last on the way to becoming a physical science since it has to finally accept the autonomy of things, and not only of living things.

It is the problem of the degree to which life can be through in the absence of man.

Increasingly, 20th-Century continental biophilosophy (Heidegger, Canguilhem, Foucault, Deleuze), but also original trends in the newest fields of biological research (the study of extremophile organisms, astrobiology, exobiology) have sinuously turned, in their search for answers, towards meta-theoretical introspection on their intrinsic conceptual and methodological limitations in addressing, historically, the problem of the living. The question posed by the nature of the “living” could be reformulated, following Gilbert Simondon’s theory of transduction as ontogenetic im-

manent processuality,1 into a question of overcoming human epistemology: whether one can and should reach an understanding of “life” through the diversity of its particular instantiations in the same way as one grasps a mathematical rule through its range of applications. Simondon, despite his concern with individualization and not with livingness as such, was positively appalled at the thought of inferring from a limited spectrum of particulars an a priori ontological principle acting with the force of a law of particular-

ization: “What is postulated in the search for the principle of individuation is that the individuation has a principle” (2009, p.4). Consequently, positing a processual ontology of “life” understood as a principled enactment of “life” in the “living” fosters anthropomorphic rationalism together with its extremely limited possibilities for rethinking life outside historical paradigms.

In *Life Explained*, molecular biologist Michel Morange invites the reconsideration of specific philosophic and scientific traditions – 18th-century vitalism, the informational paradigm of the “genetic program,” the “ultra-Darwinian” adaptive selection model – that have actively participated in the extinction of an imaginary of the living free from epistemological Chauvinisms privileging the anthropocentric conceptualization of life as inherently organic, or carbon-based. Indeed, Morange designates the work of biologist Jack Cohen and mathematician Jan Stewart in “xenobiology” (an uncanny biology of unimaginable life-forms) as a non-“terracentric” or non-DNA-centric model (2008, p.92) for approaching the problematic posed by the being and becoming of life from a perspective that obliterates us as the subjects of biophilosophy and bio-research. The problematic of an unworldly-life can gain extremely pragmatic dimensions in the course of planetary missions bent on testing, with the tools of physics, in/organic chemistry, molecular biology, ecology, geology etc. local manifestations of activity (from landscape color modification patterns, to thermal variation, to liquid trace detection) assimilable to possible life-configurations. The scientific question, in this case, becomes “how to think life in the absence of both a history of knowledge about life, and of incoming palpable, recurring evidence of something that we currently identify as life?” In a sense, the crux of the matter is not an epistemological obstacle, or at least not only an epistemological obstacle: how to know bios outside of ever-sedimenting and ever-eroding historical processes of rationalizing and imagining it, through both ratifying and rectifying, recursive and
original elements? Instead, meta-reflexivity seems to be as much part of the problem in rethinking life, as it is part of its solution: what are the conditions of possibility of a thought able to conceive bios through the erasure of the conceptualizing process itself, thus through its self-annulment as instrument?

Xenobiophilosophy would be the kind of thought that, while necessarily viscerally inter-twined with its object, could forget its own distinctness from the object – a thought that, in trying to think life beyond the range of modalities imposed by the variables of humanism, would have to become inhuman itself, would have to move in tandem with, yet differently from, both the object of thought and its past thinking trajectories with respect to it. Michel Serres calls this thought “a fractal meander”: both a fermentation of logics and a logics of fermentation, the acknowledgement of a sub-terranean quiver always threatening to re-absorb the living being into its informing “life” - a quiver

philosophically intelligible not through a dialectics of differentiation, but through a mobilization of the multiple under the direction of a kind of “opacity that thought can never incorporate or master” (Colebrook, 2010, p.7).

we must think on the side of the thinkable, [...] we must tack toward science, toward the same, toward the one and stability, but [...] we must then be ready to

conceptualizing “life.” In following a Deleuzian line of thought, she advances an original “non-organic”/“pre-organic” background plane of “pure” life-forces, liberated from material life-forms, whose interaction effects the emergence of historical modes of living. “A living being, as a being, must have its own membrane or border and a milieu; but as living must also be open to a life that can never be reduced to any single form” (2010, p.7); “There can only be an organized and bounded body (an organism) because of a relative stabilization of non-organic powers; the ongoing life of the organism requires both territorialization and deterritorialization” (2010, p.20). Nonetheless, I fail to grasp Colebrook’s explanation of the immanent workings of the “non-organic” plane unto which “organic” life emerges as merely one possible configuration among many.

2 In Deleuze and the Meaning of Life, Claire Colebrook displaces the “organic” as the exemplary paradigm for

3 “Why should it a logic of resemblance and difference, of contradiction and identity, even of continuity and discontinuity, in short a naïve logic of two choices, such as true/ false, even if we set the two theses together so that they resonate through synthesis, ambiguity, paradox or the inexpressible, why should such a logic be able to account for anything at all?” (Michel Serres, 2000 [1977], p.162).
think the unthinkable, [...] we must then change our tack, toward the pure multiple, we are continually tacking back and forth, the method being a fractal meander, to one side for safety, to the other for freedom, to one side for the regulation of our thoughts, to the other for boldness and discovery, to one side for rigor and exactitude, on the other side for mixture and fuzziness (Serres, 1995, p.114).

It is here that inventiveness inserts itself as what could be either the only dehumanizing dynamics of thought available to human beings, or alternatively an aestheticizing Fata Morgana mirroring a distorted humanism staring blindly at its own image. Creativity could be either the brief emergence of alien life through the flickering of a human thought struggling to rid itself of its human condition, or – and we can suspect this in the light of the work of Francisco Varela on autopoiesis as the index of a non-human consciousness permeating living matter – the latest re-appropriation of “life” within the limits of an aesthetic anthropomorphism. Michel Serres, in his interviews with Bruno Latour published under the title Eclaircissements, stages himself as the philosopher-inventor and almost as the inventor of philosophy. Interestingly, Gilbert Simondon also regards creativity as the equivalent in the field of knowledge of transduction, by which he understands a “vital operation” (2009, p.11) through which “life” passes in its individual forms by means of a constantly structuring interaction between actualized and non-actualized forces that render the living being a bundle of becoming, always on the edge of becoming dissonant with itself.


6 “[Transduction is] the correlative appearance of dimensions and structures in a being of peindividual tension, that is to say in a being that is more than unity and more than identity, and that has not yet dephased itself into multiple dimensions. [...] Transduction
Yet invention, as a resurgence from within the 'classical' sciences of mathematics and physics in the form of thermodynamics, non-linear system dynamics, chaos, complexity, self-organization, autopoiesis, etc. and as a resurgence from within philosophy, in the form of Bergsonism, Deleuzianism, Serresianism, etc. presages a paradoxical speculative neorealism that posits as fundamental truth the ultimate unknowability of the truth of life. Ambiguity, uncertainty, and paradox become inherently constitutive of an infinitely more accurate epistemic climate, capable in the end of some kind of truth. In Power and Invention: Situating Science, Isabelle Stengers identifies what I call “speculative neorealism” with the revival of classical scientism:

What seems to happen is that themes of world crisis, and a questioning of the presuppositions that allowed us to underestimate the crisis or to think of it as epiphenomenal, are inter-woven with the themes of a “new rationality.” This is an eminently classical scientism, in that the renewal of the scientific knowledge that was initially critiqued is heralded as a solution to ethicopolitical problems. (Stengers 1997, p.3; my emphasis).

Stengers urges the demessianization of complexity theory on the grounds that it does not “delineat[e] the characteristics of a “new science” that we were previously unable to imagine” (1997, p.4), but argues for the urgency of such original scientific poetics as a kind of meta-reflexive enterprise, as the critique of past forms of thinking, obsessive-compulsive in their decontextualizing reductionism, a-historicism, and mathematical idealism. “[C]omplexity arises when [scientists] have to accept that the categories of understanding that guided their expectations are in question, when the manner in

can be a vital operation; it expresses, in particular, the direction [sens] of the organic individuation [...] In the domain of knowledge, it defines the veritable process of invention.” (Simondon, 2009, p.11).

7 “science occupies the singular position of a poetic listening to nature – in the etymological sense that the poet is a maker.” Isabelle Stengers. (1997). Power and Invention: Situating Science. p. 45.
which they pose their questions has itself become problematic” (Stengers, 1997, p.12). Indeed, Stengers continues,

“[t]he qualitatively new questions that eventually become possible [...] express the limited character of the conceptual tools that were appropriate for singularly simple cases but that cannot be prolonged with relevance” (idem, p.11; my emphasis).

For Michel Serres, invention is not a policing of the past, a 'straightening up' of knowledges and histories of knowledge, a violent but utilitarian refinement of thought. I would argue that Serres concerns himself also with the problem of relevant prolonging from the local to the global, and with the problem of relevant folding of the global into the local (which is also the problem of causality and determinism) as with a “science of relations [...] of conventions, assemblies, contests, coitus” (Birth of Physics, 2000, p.123). Causality, reversibility, predictability – all historical forms of thinking the relation between elements as


“the repetition of a homogeneous law” (idem, 2000, p.191) rendering automatism the rational practice par excellence – can be countered by an inventiveness, a poiesis that comes from the guts of science, from the Ancient atomistic haruspicy of nature, a practice of thought half-focused on its own unfolding process, half-focused on life as that which could potentially be unfolded in the process.

In the two books that offer a most densely packaged yet thorough introduction to Michel Serres' genetic philosophy – namely, The Birth of Physics (2000[1977]) and Genesis (1995) – the author advances a two-tier system: (1) a fluid, relational physics grounded in material “turbulence” as a universally cohesive yet locally differential process of ontogeny of being, inspired by Ancient Lucretian atomism; (2) an “information” theory of “background noise” as framework of intelligibility for a version of material consciousness, immanent in the physical object whose material be-comings it registers in the form of a communicable and always revisable semi-cognitive life-history.
The originality of Serres as historian of science lies with a mathematical philosophy of time that spatializes the flow into a temporarily crystallized plane of networked events (a phase) whose chronological significance is circumvented by the possibility of topological distortions in the linearity of the trajectories connecting those events, and in the linearity of their relations of determination. Such a “quantum” time moves intermittently both in a continuous manner and by jolts, thus occasionally violently separating events close to one another in a particular phase, or aggregating events previously far apart in a specific phase: “it’s simply the difference between topology (the handkerchief is folded, crumpled, shredded) and geometry (the same fabric is ironed out flat). As we experience time – as much in our inner senses as externally in nature – as much le temps of history as le temps of the weather – it resembles this crumpled version much more than the flat, overly simplified one” (Serres, qt. Clucas 2005, p.77). Climatic, non-linear time allows Serres to behold in the 20th-century scientific paradigm of “thermodynamics” the renaissance not of a crisis-in-knowledge, but the reinstatement of knowledge-as-crisis which hallmarked Ancient philosophy and science: “We are now closer to that nature which, according to the rare echoes that reach us, the pre-Socratics reflected on, and also to the sublunary nature whose powers of growth and corruption Aristotle described, to the inseparable intelligibility and incertitude of which he spoke” (Serres, qt. Stengers, 1997, p.37). As Ilya Prigogine & Isabelle Stengers convincingly argue in “Dynamics from Leibniz to Lucretius,” the “thermodynamics” revolution restored not merely an

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9 “[Thermodynamics] constitutes a new paradigm, so significant, so global, that we haven't so far clearly recognized it, despite our living, working, and thinking by means of it and in it, for over a century. [...] It is the producer of forces themselves, through accumulation, difference, and circulation, it can and knows how to built the engines. And, all of a sudden, everything is engine: this is how the world works, the sea and the winds, living systems and signal transmitters, everything that is in movement, from tools to the cosmos and from history to language. General philosophy of things which we're still unsure of having left behind, having been unaware that we were in it” (Serres qt. Gendron, 2007, p.43).
epistemic (a human-centered perspective), but an ontological indeterminacy to cosmic processes of material self-directedness. Indeed, Serres does not deny self-directedness (the capacity inherent in matter to “move” from one state to another, from one condition to another, from one event to another in its constant self-differentiation that is its living), but he does deny a specific pattern in material self-directedness and directional relationality (no ultimate telos or ideal virtual condition that matter should/ would attain if it “moved” in adequacy with its own laws as actualized within different local configurations).

The “classical” episteme of physics (Descartes, Galileo, Newton) presupposed an inherent knowability of the functional patterns of a dynamic system over time, in function of (a) knowledge of a set of initial conditions to which the time-dependent differential activity of the dynamic system could be reduced; (b) knowledge of a set of rules homogeneously applicable as much to the dynamic system in its totality, as to its components, so that an algorithm could be specified for the ways in which those initial conditions would unfold through the activity patterns of the dynamic system. In the 18th-century, the intelligibility of the functional history of such a dynamic system would poetically translate into Laplace's demon: close to the anthropocentric Archimedean injunction “Give me a place to stand on, and I will move the Earth” lies the demonic temptation of calculating the evolution of the Universe as a closed system in motion starting from knowledge of each single particle and its movement speed. The epistemological conditions unspoken by Laplace's evil spirit are determinism and predictability, “reversibility” by which we mean an instrument of thought, a “syntactic rule” (Stengers) allowing the mental exercise of unfolding forwards and backwards a dynamic situation, from causes to effects and from effects to causes in order to certify quantitative/ qualitative equivalence, also “integrability” by which we mean that a system’s holistic behavior is seen to be analyzable as the sum of the behaviors of its component parts – a sort of mechanistic “organization” theory. Even as early as 1903, in Science et Méthode, Henri
Poincaré warned about emergentism—“small differences in initial conditions generating great differences in the final phenomena” (qt. Boi & Bois 2009, p.227)—and about the “natural indeterminism” (less than average accuracy in probabilistic prediction, diminishing over time) of a specific class of phenomena and dynamic systems, what Ilya Prigogine terms “dissipative structures.” These open systems are conceptualized through their flux of energy transactions with the environment, which has re-structuring effects within the inner milieu: thus the “irreversible” entropic movement of dis-organization (far-from-equilibrium condition) of specific natural systems sensitive to the history of their energy economy, “dis-organization” signifying here only the disintegration of a specific functional milieu relative to a previous “organizational” state. A natural system of a specific type could be said to traverse a series of “organizational” states over the course of its lifetime, each thinkable as internally orderly (functional) at a specific time T yet disorderly (chaotic) from the perspective of its position within a holistic history of temporal states, and by chaos one signifies, with Katherine Hayles, “extremely complex information rather than an absence of order” (qt. Gendron, 2007, p.164-165).

Excavating underneath the flattening formalism of idealist models “which exclud[e] chance and the uncontrollable, what today we would call hyper-complexity” (Serres, 2000[1977], p.68), Serres understands to locate the irruption of the natural, of “concrete experience,” in the Lucretian clinamen, the orderly disordered fortuitous atomic event of the vortical swerve. Within the extra-temporal and extra-spatial laminar flows of solid atoms, smallest angles are produced, here and there, simultaneously with their uncertain times and places, as deviations from the linear trajectories of strictly parallel fluid strings. An irregular interlacing of different atomic deviations, the clinamen is “the smallest imaginable condition for the original formation of turbulence” (Serres, 2000[1997], p.6) and for the genesis of life as movement from and not movement towards.

*This idea goes to the heart of philosophy, that is, metaphysics.*
If we had only the principle of identity, we would be mute, motionless, passive, and the whole world would have no existence: nothing new under the sun of sameness. We call it the principle of reason that there exists something rather than nothing [...] it says: exist rather than. Which is almost a pleonasm, since existence denotes a stability, plus a deviation from the fixed position. To exist rather than is to be in deviation from equilibrium [...] We do not exist, do not speak and do not work, with reason, science or hands, except through and by this deviation from equilibrium. Everything is deviation from equilibrium, except Nothing. That is to say, Identity. (Serres, 2000[1977]: 21)

Nature runs, indefinitely, down the river of its heavy elements, towards an equilibrium. [...] Here or there, yesterday or tomorrow, deviations appear stochastically. Or differential angles of inclination. Here is something rather than nothing, here is existence, here are vortices, spirals, volutes, all models out of equilibrium. They are brought back to zero by deterioration, ruin, and death. But, temporarily, they form. (Serres, 2000[1997]: 22)

Serres introduces a universe where the differentiations between the human/ nonhuman and the organic/ inorganic dissolve into non-linier fluctuations between perpetually dissipative “stabilizations” of material (the vortex, the cloud, the turbo, turbulence) and perpetually deviating, perpetually clotting background flow of un-formed matter (the laminar, the turba, the fluxion). His cosmic biology is a “physics of immanence” (p.54) concreted into relational events (the almost-simultaneous collision, entanglement, and separation of a multiplicity of movements and temporalities as the life of matter) best captured into the vortex as formative happenstance. The concept of life itself is, in this context, de-anthropomorph-ized, no longer understood through the “vitalism” of the organism – implying particular forms and teleological modes of functioning of closed material systems – but through homeorrhèsis, a material energetism that rethinks materiality and organicity as a non-linear struggle between some kind of in-forming and other kinds of in-forming forces:
“The soul is a material body, the body is a thing, the subject is just an object, physiology or psychology is just physics” (Serres, 2000[1977], p.49); “Every object, naturally, emerges like Aphrodite from a flux of elements [...] Born from this and, as soon as it is born, complex, twined, twisting its long thick hair, it begins to transmit, in floods and in all directions, a star of flow: its wear and its time [...] In the same way or inversely, it receives the flow emitted around it, from the vicinity and the edges of the open universe alike, whether it be rock, harvest, horse or woman. The world, in total, flows in itself and through itself” (Serres, 2000[1977], p.50).

David Webb discusses in the article “Michel Serres on Lucretius: Atomism, Science & Ethics” Serres' methodology in terms of a “'general' account of flow” as itself susceptible to the same patterns of emergence, variation, and dissolution that it describes. As such, it proposes the mutability not only of physical order and physical law, but also of the philosophical basis for such a conception of mutability.

It is a way of thinking that welcomes its own transformation. (2006, p.126, emphasis mine).

Serres could be said to argue that “the introduction of an irreducible ambiguity into the relation between the determining and the determined elements opens not just on to the problem of time, but also on that of sensibility, in the guise of our affection by things, and even on to the relation between the sensible and the intelligible, in the guise of our conceptualization of what is given through sensibility” (David Webb, “Introduction” to Birth of Physics, 2000, p.xiii-xiv; my emphasis). Michel Serres' “chaos and complexity” framework – the creative language of 21st century science – is not teleologically oriented neither towards the concrete regeneration of rationality through the criticism of its pathological history, nor towards the approximation of a truth-of-life epistemologically superior precisely through its fuzziness. But, circumstantially, both processes could be triggered even in the absence of foreseeable finalities. Serresian xenobiophilosophy (as both a
philosophy of strange life and a strange philosophy of life) has the potential to reconfigure simultaneously the predominant organo-centric conceptualization of life within the life sciences, and the logocentrism of human thought. The figure of “turbulence” as an ensemble (system) of non-teleological and non-linear transformative movements within matter grounds a cosmic abiogenesis no longer fetishizing an organized and membrane-bounded organism, for which the human body and then the cell have been the privileged icons. Instead, it takes change, or difference itself, as that which – beyond the human/nonhuman and organic/inorganic divides – constitutes both the possibility of life, and the possibility of thinking it. Anne Crahoy, in her 1988 book *Michel Serres. The Mutation of the Cogito. Genesis of the Objective Transcendental*, writes: *All engine functions through difference [...] Spatial difference, distance between two volumes,*

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difference between a high and a low point, between a positive pole and a negative pole, a hot source and a cold source. From the instant there is difference, there is movement. This is it: difference is a minimal structure. Or, to consider the structure or the difference as already given means cheating. The true problem of the engine is the production of a force which isn't already there, consequently the production of a structure or of a difference. (qt. Pierre-Marc Gendron, 2007, p.48; my translation).

Pierre-Marc Gendron similarly argues in his dissertation *The Extraordinary Voyage. The Method and Discourse of Michel Serres*, that more than the relation of difference between the elements of a system, or structure in the mathematical – not linguistic – sense, it is the historical processes of production of relations of difference that interest the philosopher. “Xeno-” as difference operator for the alienation of life and thought as currently known works simultaneously as a historical bond – xenia – that brings differences into circumstantial conjunction. Xeno/ia names the Serresian relation (hospitable parasitism, parasitic hospitality)
of bios and logos, life and philosophy, and their differential sliding along and into each other.

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Although mice have been an important part of the biomedical research for almost a century, the ways in which they are produced for research have multiplied over the years. This article seeks to question what the latest attempts to create humanized mice models, meaning mice that have been engrafted with human cells, tissues or organs in order to better mimic human conditions, can tell about the contemporary biomedical practices. The basis for my analysis is Gail Davies’s article “What is Humanized Mouse?” (2012), in which she argues that the aims to produce humanized mouse models create “a vocabulary which considers humanized mice as a contingent assemblage or becoming” (Davies, 2012, p.130, my emphasis). The concepts of “becoming” and “assemblage” connect Davies’s analysis of the notion of humanized mouse to a Deleuzian worldview that argues for a more fluid and complex understanding of the material world. However, these concepts are also linked to the philosophical approach in Deleuze’s work, which he differentiates from a scientific endeavor. As Todd May explains in his article “When Is a Deleuzian Becoming?” (2003), “the point of a philosophical perspective is not to tell us what the world is like – that is the point of science – but to create a perspective through which the
world takes a new significance” (May, 2003, p.142). How does the production of humanized mouse, which is a scientific undertaking, create “a vocabulary” that connects them to Deleuzian philosophy? In this paper, my aim is to locate Davies's analysis of the humanized mice to a broader question of the difference between science and philosophy. What kind of vision of scientific research does the notion of the humanized mouse create?

Deleuze highlights how the physical world should be considered as complex, relational, and dynamic – terms that defy the possibility to explain the world as a sum of distinct entities...

In their book What Is Philosophy? (1994), Gilles Deleuze and Felix Guattari argue that philosophy and science have a different kind of approach to the immanent world. While Philosophy, according to them, is able to work in the field of immanence through abstract concepts, science aims to locate functions by stabilizing particular variables (Deleuze & Guattari, 1994, p.118). In order to understand why this is so, it is important to connect it with the overall works of Deleuze, as Todd May has done in his article “Gilles Deleuze, Difference, and Science” (2005). May states that in order to examine Deleuze’s vision of science, it is important to understand his definition of immanence. The general definition of immanence refers to the denial of the transcendental idea that there is a God outside of the physical world. Instead, God is inherent in the world. However, instead of connecting immanence with a theological God figure Deleuze approaches it with the notion of multiplicity. By connecting the notion of immanence with the idea of multiplicity, Deleuze highlights how the physical world should be considered as complex, relational and dynamic - terms that defy the possibility to explain the world as a sum of distinct entities. Deleuze calls this irreducible character of the world as virtual
Deleuze's notions of “becoming” and “assemblage” are philosophical concepts that aim to explain the formation and co-existence of things in the world. However, as Deleuze and Guattari highlight in A Thousand Plateaus (1987), this does not mean that world would consist of relations of distinct entities such as animals or women but becoming-animal refers to the movement in which heterogeneous assemblages are formed. Within these assemblages the meanings of things are actualized. In other words, becoming refers to a process of meaning making that is tied to the virtual immanence of the world. Becoming can never be finalized since it marks an actualization of things that gain their material form as well as their social meaning within a temporary alliance of multiplicity (Deleuze & Guattari, 1987, p.238-242). Although this is only a partial explanation of a much broader and complex philosophical network, this examination helps to underline how these Deleuzian concepts tie the experienced world with a broader understanding of a fluid material ontology. Scientific practices, in Deleuzian reading, cannot tackle this dynamic materiality because they stabilize their objects in order to study them. In this light, Davies’s definition of the humanized mouse models is intriguing since it seems to go against the stabilizing effect of science. Davies explains her usage of Deleuzian terms by stating that they help to “conceptualize humanized mice less as an object, even a relational object, and more as a series of overlapping vectors, which have direction and velocity, but no singular identity” (Deleuze & Guattari 1987, p.238-242). What makes humanized mice such an evasive category?

A humanized mouse, for Davies, is an expression of the fact that biomedical research is
acknowledging that focus on genes or other single entities cannot, at least in most cases, offer comprehensive information about the nature of a disease. She connects the humanized mice with an ongoing change in biomedicine from genomics to post-genomics. While genomics focuses on particular genes, post-genomics aims to take into account the complexity of the organism and its relation to the environment. In mice model production, the need for such an approach becomes painfully obvious from time to time when drugs tested with mice have unforeseen complications when given to humans. Davies highlights one pre-clinical safety trial where the immune systems of mice did not react to the leukemia drug whilst human immune system reaction led to an organ failure in many patients. The humanized mice, then, are thought to minimize the possibility for such a situation by creating mouse models that would, due to the engrafted human cells, represent a human disease as closely as possible. Moreover, Davies notes that there is not only an attempt to mimic particular human diseases but also to create humanized mice that would imitate the human immune system. These humanized mice are seen as central to the future of translational research that works towards facilitating the information transfer between the clinic and the laboratory, namely that drug inventions could be speeded up and be more cost effective without compromising the safety of the human trials (Davies, 2012, p.131-135).

Although the attempts to create a humanized mouse can be seen as an example of a more holistic vision of organism taking place in biomedical research, it is not due to this that Davies connects the humanized mouse with the idea of becoming. On the contrary, the plans for the humanized mice go as far as to imagine them as possible “translational objects” (Michael, M. quoted in Davies, 2012, p.134). This implies that rather than accounting for the corporeal differences between mice and humans, the research aims to dismiss them through genetic manipulation. Instead, Davies connects the Deleuzian potentialities of the humanized
mice to the realities of the production of the models – or, more precisely, to the attempts to produce such models – in addition to the post-genetic reasons behind them. She highlights that although the aim of the humanized mouse models is to mimic humans, there is always a possibility that manipulation turns mice to something unplanned due to the practical issues, such as the cleanliness of the laboratory space, as well as corporeal differences. Thus, Davies argues that “the humanized mouse remains an experimental process, with uncertainties about precisely what is being modeled, and under what conditions” (Davides, 2012, p.140). This uncertainty is fueled by the fact that the complexities of the manipulation of the mice have required scientist to collaborate with multiple research fields, such as stem cell research and pre-clinical trials, which are more and more concerned with the personalized medicine (Ibid., p.143). This leads to a situation where the question of producing animal models is not only concerned with the bodily differences between humans and animals, and their diseases, in general but also with the fact that no human is the same as another. As Davies states “biological and disciplinary multiplicity [of humanized mice] enables new forms of species co-presence and interdisciplinary collaboration, but their association constructs of individuality bring forth new forms of absence and new axes of difference” (Ibid., p.144) leading to a situation where research can only be “almost there” since “not only are there many humanized mice in the world, there are also many worlds in the humanized mouse” (Ibid., p.147).

It is clear, then, that the challenge that the humanized mice bring to the research can be connected with the Deleuzian vision of the virtual world full of complexities that cannot be explained only by referring to separate entities. Still, it is good to keep in mind that the starting point of Davies’s analysis is the scientific

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1 Personalized medicine studies diseases as person-specific, taking into account individual factors that could have affected to the formation of the disease.
vision that the humanized mice could sometime in the future function as simple translational objects for human conditions. However, what seems to be missing from Davies’s account is the question of the role of reductionism in the scientific research. Although scientists might dream about creating a mouse model that could fully represent human disease or the immune system, usually the aim of animal experimentation is not to create miniature humans but to form a platform that could simulate certain aspects of human diseases. As Monika Piotrowska’s states in her article “From Humanized Mice to Human Disease,” (2013) the humanized mouse can still be seen as functional mechanism that can offer information about the components of the human disease if the study also takes into consideration the internal, environmental as well as evolutionary context of the organism. Thus, according to Piotrowska, the complexity of the organism is not necessarily an obstacle to a mechanistic viewpoint, that is, to the vision that specific functions happening in the organism can be explained by identifying the components that take part in the formation of the disease (Piotrowska, 2013, p.453-454). In other words, there is no need to represent the whole human in a mouse but only the parts that take part in the formation of a disease. Consequently, this viewpoint reminds that humanized mice are based on narrowing down the possible causes of the disease and, hence, animal experimentation does not, as such, require a corporeal equivalence between mice and humans.

That being said, it is noteworthy to pay attention to the way in which Piotrowska’s article highlights the problematic nature, rather than the possibilities, of the production of the humanized mice that would fulfill her requirements for this kind of revised mechanistic viewpoint. By analyzing recent research, she emphasizes that neither is the juxtaposition between human-ized mice and human condition often justified, nor is the production of humanized mice usually successful (Ibid.). Piotrowska’s viewpoint ties the humanized mouse more closely to Hans-Jörg Rheinberger’s vision of an experimental system. In his article “Experimental Complexity in Biology,” (1997) Rheinberger
argues that although experimental research needs to reduce the complexity of the organism in its approach, the complexity of the research object does not cease to exist and can “allow researchers to arrive at unprecedented, surprising results” (Rheinberger, 1997, p.247). However, it is important to make a distinction between how Rheinberger defines model organism and its function as an epistemic object in research and Davies’s analysis of the humanized mouse model. Rheinberger’s definition of the model organisms, described in his book *An Epistemology of the Concrete* (2010), highlights the role of the model organism as a site to learn more about biological functions. Thomas Morgan, for example, used fruit flies, to map the functions of genes. Hence, Rheinberger points out, the relevance of model organisms is tied to a lack of knowledge and, consequently, “the emergence of certainty about a particular question abolishes the need for models altogether” (Rheinberger, 2010, p.8). Mouse models, however, do not share a similar history with fruit flies. As Jean-Paul Gaudillière argues in his article “Mapping as Tehnology,” (2004) whereas researchers studying fruit flies were interested in genetic mapping, the mouse model researchers were also involved in modeling human pathologies. Hence, Gaudillière emphasizes, “The [genetic] mapping of mice did not follow the mapping of flies, because mice were constructed as human beings” (Gaudillière, 2004, p.200, my emphasis). The humanized mouse model production, as analyzed by Davies, follows this logic by demanding a definition for the humanized mice that would be in-between an epistemic thing and a technical object, meaning an object whose status in research would remain constant (Davies, 2012, p.137). In other words, though the humanized mouse model cannot be described being an epistemic thing, since its purpose is not only to model a human disease but to function as a replacement for human subject, for instance, in pre-clinical drug trials, the inability to stabilize the production of the humanized mice prevents its becoming a technical object either.

Nevertheless, it is important not to reduce the question about the scientific value of the humanized mice to a question
about the bodily equivalence between humans and mice models (although this certainly is the question that brings funding for the research). As Davies highlights, in some cases the mutant mice might not offer researchers the information they were looking for but they can still be valuable in other type of research. What is more, attempts to manipulate mice increase researchers’ knowledge about the mice themselves. As Davies points out: “Talking to researchers, there is uncertainty about whether they are involved in model development or basic research, and indeed where these boundaries now lie” (Ibid., p. 137). The humanized mice can then be seen as a way to learn more about the complexity of an organism, if only in mice.

It is clear, then, that the role that the humanized mouse production has in the biomedical research today is not a straightforward one. The in-between status that Davies connects with the humanized mouse highlights the co-existence between Deleuzian notions of science and philosophy. As May emphasizes, even though science focuses on functions it is not separated from the virtual. Thus, according to him, science and philosophy “must inevitably come into contact; their trajectories must periodically intersect” (May, 2005, p.254). This, according to May, also explains why Deleuze uses scientists’ visions of life to back up his theories about the virtual (Ibid., p.251-254). For some humanized mice can offer an example of scientific research concerned with philosophical questions about life and its forms, due to the practical problems raised by the failure to produce the aimed outcome, while simultaneously one could argue that the fact that scientific research even tries to create a humanized mouse proves that scientific research is more eager to control than understand the complexities of the organism. Seeing these two approaches as entangled in the case of the humanized mouse helps to clarify how Deleuzian vision of science and philosophy co-exists. In addition, I wish to highlight with the example of humanized mice that the logic behind scientific research cannot be seen separated form the sociohistorical context it is
produced in. This is not only to question why scientists attempt to create humanized mice for disease research today, and why they believe that it could be possible to create such a model, but also to question how scientists came to think that they need to revise their view about the organism. Although this article has not fully made justice to the complexities connected with the issue, I wish to have managed to bring forth the relevance of asking these kinds of questions when thinking about the connection between scientific and philosophical questions about life.

REFERENCES


ANIMAL METAPHYSICS, METAPHYSICAL ANIMALS: THE RESTLESS HOPE OF/FOR THE NEGATIVE


Manta Alexandra Claudia

IN THE HISTORY OF (Western) metaphysics, the figure of the “human” is striped with the scars of an ever-surfacing and ever-receding animality. Following the recent scholarship of Giorgio Agamben (i.e. The Open 2004), the dynamics of such an intermittently beaming animality in, and through, the language and thought of “man,” is ultimately operative within an “anthropological machine” driven by the fuel of Hegelian dialectics. As such, the flickering animal has either been reabsorbed, usually within the framework of naturalistic materialism, into 'organic continuity' with the human – as a qualitative difference potentially transcendable; or, alternatively, it has been ejected at the edges of humanity as an insurmountable protective gap maintaining the solitary and autonomous intelligibility of the anthropic spirit. This logics of inclusion/exclusion Oxana Timofeeva does not claim to bring to a halt, but rather to re-orient by means of an intervention in its functional kinetics: her self-proclaimed “naïve” readings of the animaux/animots of the metaphysical tradition is meant not so much as an emancipatory technique, but as a problematization of philosophical humanism through its historicity. Thus, she argues that “the very inevitability of the representational frame provides viability to the utopia of the
“real” animal, which rather than being represented or representing something already given instead “opens” - but always retrospectively – the immediate givenness of the “real” of the human being itself” (2013, p. 13).

One fundamental concern of Timofeeva's work is the potentiality inherent in different philosophical systems for transforming the regimes of physical and conceptual relationality between the human being and the animal – indeed, for overcoming the historical “failure” of animals in their immanence to an anthropocentric cosmological order premised upon their “negativity.” The unfolding narrative of Western structures and mechanisms subservient to troubled human-animal co-existence stretches from Bataillean ancient totemism, to medieval animal trials in Europe; from Saint Francis of Assissi’s poverty as a methodology for human-animal communication, to Cartesian animal-excluding rationalism, from Hegelian ontology to Kojèvian anthropology, from Kafkian animal stories to contemporary performances of ritualistic sacrifice. Underlying it, there is a Marxist-inflected reading of Hegelian idealism as a latent form of pressure upon situated networks of material relations for them to transform in line with their historical conceptualizations: “On the contrary, therefore, it is general determinations which must be made the rule and natural forms compared with it. If they do not tally with it but exhibit certain correspondences, if they agree with it in one respect but not in another, then it is not the rule, the characteristic of the genus and class, etc., which is to be altered, as if this had to conform to these existences, but conversely, it is the latter which ought to conform to the rule” (Hegel, qt. Timofeeva, 2013, p.71). Timofeeva's reading of Hegel not only opens up a transformative politics of the natural status quo, but allows for a subversive reconceptualization of the “negativity” of the animal. The “negativity” of the zoologicus is premised upon (1) on the one hand, Giorgio Agamben's theory of the subsumption of animal “pure voice” within human articulated speech as the signature of death branding the emergence of
consciousness; (2) on the other hand, a Canguilhemian understanding of organic sickness as an inherent condition of animal life, namely the fundamental incapacity of the animal to spontaneously recreate its vital internal milieu contingently, in response to imminent changes in environmental conditions. In a sense, the animal does not seem to enjoy a surplus of organic mobility and indeterminacy allowing it, in Simondon's words, "an individuation by the individual and not only a functioning that would be the result of an individuation completed once and for all" (qt. Timofeeva, 2013, p.27) – therefore the mechanics of animality canonically stultifying animal life and individuality within the history of philosophy. But Timofeeva ultimately offers a bold reading of such "negativity" (via Jean-Luc Nancy) by rendering it the turning point for the rethinking of the animal as "restless" for becoming-something-other. The immanent "negation" of animality within the framework of Western thought has conferred upon it a drive towards escaping the immanent into a future of "freedom from."

Metaphysical animals are always already desirous for their own otherness, for their becoming-other, in a way that the human being might not be. According to Timofeeva, an animal metaphysics will use this insight for problematizing the human as an animal not "negative" enough, and consequently, not enough desirous for striving against its own condition. Perhaps we have never been truly human, only not animal enough: "Is it not possible, then, that the passage from animality to humanity is either still underway, never to be completed, or, in what might be the same thing, was always doomed from the start to be a failed passage? Might not the transgression of the boundary separating humanity and animality be not against animality per se, but against the idea that animality had been left behind in the thought of our birth? [It is] the acknowledgement of being always already prehuman" (Brett Buchanan, qt. Timofeeva, p.106). I heartily recommend this intellectually stimulating book to scholars in animal studies, Continental philosophy, political philosophy, and feminism & gender studies.
ANNOUNCEMENTS, CALLS FOR PAPERS, AND EVENTS IN SCIENCE STUDIES AND RELATED DISCIPLINES

The Editorial Team of *Pulse* has compiled the following list of upcoming conferences and events within the interdisciplinary field of Science Studies. Though this list is by no means comprehensive, it provides our readers with several opportunities for continued participation within this field. Additionally, the calls listed below serve another purpose for our journal: the broad spectrum of intriguing questions they pose may serve as ideas for new essays and areas of academic exploration for our prospective authors. Whether or not you prepare to apply to present at these conferences -- and we strongly encourage you to do so -- consider the questions that these calls challenge us to answer from a variety of vantage points.

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**Listening to Literature, 1900-1950**

*March 12-14, 2014: KU Leuven*

*apply before July 1, 2013*

**Keynote:** Julian Murphet (University of New South Wales, Sydney)

This three-day conference seeks to survey the impact of aural media (phonograph, gramophone, telephone, radio) and other major sound events of the first half of the twentieth century on the literature of the period. Through in-depth analysis of the different ways in which modernist and avant-garde authors reflected on and incorporated sound and aural technologies in their writings, we aim to explore the literary soundscape between 1900 and 1950.

The first half of the twentieth century – “the age of noise” in the words of its contemporaries – is littered with events crucial to the history of modern aurality. The phonograph and its successor, the gramophone, enabled man to record and replay sound. Telephone and radio enabled long distance verbal communication. The combustion engine filled the big city with its incessant mechanical drone. And of course there were the two World Wars, whose aural impact – deafening bombings, nerve-shattering sirens, the rhythmic stamping of marching feet and the continuous drone of planes overhead – can hardly be overestimated.
This conference aims to explore the impact of these and other related events on the literary landscape of the period, looking for the answers to such questions as:

*How is sound represented? What techniques are used to represent sound? What kinds of sounds are represented and how do they compare? What function do the represented sounds fulfill within the literary work? Was the representation of sound altered by the introduction of new aural media such as the phonograph or telephone? How were the various aural media themselves represented? What is their function within the literary work? How are they used as a literary motif or device in the work of particular authors? How can we study sound within the literary work? How does fictional sound relate to actual sound? Are there substantial differences in the treatment of sound within the period, for instance between modernism and the avant-garde, but also between authors, genres, generations? And if so, how can they be explained? How does the literary representation of sound relate to that of the other senses? Do they fulfill different functions within the literary work?*

We welcome both theoretical and case-based studies on these and other questions central to the mapping of the literary soundscape between 1900 and 1950. **Proposals (in English) should be sent to ltlconference@arts.kuleuven.be by 1 July 2013.** These should contain a 300-word abstract as well as a short bio listing contact and affiliation details.

The first day of the conference will cater specifically to postgraduate students, enabling young and promising scholars to present their research and collaborate with their peers. The conference is organized by the Leuven-based research team MDRN. For more information, visit [www.mdrn.be](http://www.mdrn.be). For further questions, please contact tom.vandevelde@arts.kuleuven.be or tom.willaert@arts.kuleuven.be.

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**Beyond the Victorian and Modernist Divide**  
**March 27-28, 2014: University of Rouen**  
Apply before September 15, 2013

Ezra Pound’s injunction to “make it new!” or Virginia Woolf’s “on or about 1910” statement have long been used in order no support a version of modernism as a strictly aesthetic revolution — or crisis — implying an essential break with Victorian art, culture and ideology. In the last decade, however, the crucial transition between the nineteenth and twentieth centuries has been variously reassessed. In the wake of the new modernist studies and of the recent revaluations of the Victorian period, a growing body of scholarship now challenges traditional periodisation by examining the existence of overlaps and unexplored continuities between the Victorians, the post-Victorians and the modernists. Once separated by a critical and cultural break, Victorian and modernist scholars have become preoccupied with a similar search for cultural and aesthetic complexities that make it possible to move beyond doxic
discourses and fixed dichotomies: the past and the present, outer life and inner life, materiality and spirituality, tradition and innovation, ideology and aesthetics.

This international conference would like those scholars to join forces and contribute to this new phase in the Victorian-modern debate from a broad range of perspectives across the disciplines: literature, criticism, the visual arts, history, science and philosophy. The emergence or re-emergence of ideas such as the “modern”, the “new” or “change” at the turn of the century is an indisputable fact that we want to acknowledge and re-contextualize by examining the different meanings and practices they encompass. From there, we wish to explore the birth and perpetration of two critical meta-narratives and their interdependence: the myth of “high modernism” and the myth of “Victorianism”. If there is no clear repudiation of history and heritage on the modernists’ part, if “rupture” was a useful fiction, if the challenge to traditional aesthetics and ideology was already a Victorian preoccupation, then we definitely need to remap modernism and Victorianism simultaneously.

The papers that we call for are meant to contribute to a trans-disciplinary publication whose synopsis could be the following, although it is far from being fixed.

I- Periods, words, labels: historicizing and contextualizing the idea of the “break”
II- Victorian, Edwardian and modernist literature: unexplored lines of filiation
III- Art history, aesthetic philosophy and the visual arts across the Victorian/Modernist divide
IV- Science, philosophy, ideology: landmarks for a new history of ideas
V- New approaches to identity, gender and the self: from mid-Victorians to modernist ideologies and practices.

The proposals (300 to 500 words with a short biographical notice) should be sent to Anne-Florence Gillard-Estrada (af.gillardestrada@orange.fr) and Anne Besnault-Levita (annelev@club-internet.fr) by September 15, 2014. Notification of acceptance: October 15.

Fourteenth Ischia Summer School on the History of the Life Sciences: Geographies of Life
June 2015 – Location TBA

Preliminary introduction to the theme
Since Aristotle’s famous empirical studies, which included the Mediterranean fauna, the sea has attracted naturalists as a source of wonders and life forms that straddle the lines of conventional, land-based classifications. Land and sea formed separate spheres in a closed and structured cosmos. Early modern voyages of exploration added a geographical dimension to the study of biodiversity by bringing exotic plants and
animals to attention, and thus contributing to the idea of the our planet as one ‘terraqueous globe’.

It was, however, only in the late 19th and early 20th centuries that the sea also acquired a layered depth and a detailed topography. In addition, international network of experimental stations dedicated to particular environments, such as marine biological stations, or high altitude research institutes, emerged, which allowed for in situ studies of living specimens and their development and ecology. National interests in agriculture and and fishery, the integration of meteorology and hydrology in climatology, and finally, plate tectonics and palaeontology, led to an unprecedented collapse of land and sea into one contiguous whole, rather than polar contrast.

This summer school takes on board recent geographic approaches to the study of the history of science, medicine and technology, and the rise of interest in ‘oceanic histories’, in order to explore what these can teach us about the evolving relationship between humans and the global environment.

**Timetable for applications**
November 2014: Announcement and call for applicants
31 January 2015: Deadline for applications

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**ARCHAEOACOUSTICS: The Archaeology of Sound**
*February 19-22, 2014: The University of Malta*

Apply before September 1, 2013

This conference offers a multidisciplinary look at early sonic/aural awareness and lithic sound behavior, toward a better understanding of human and music development.

The intent of this conference is to explore the importance of sound in antiquity, sharing focused expertise from a variety of backgrounds in order to provide a forum for expanding previous conceptions and introducing new methodologies. We are particularly interested in the role acoustic behavior may have had in the development and design of important architecture and ritual spaces throughout the ancient world.

All presentations will be in English. Performance proposals will also be considered. Submission of abstracts for a 20-minute presentation and proposals for posters/demos on any topic related to the theme will be open until 01 September 2013. Abstracts should be 300 words or less plus title and author details. Authors of papers accepted for presentation by the academic committee will be notified by 15 September 2013. Final papers are required by 15 January 2014.

Submissions should be made to: Conference2014@OTSF.org
Organized by The University of Malta and The OTS Foundation
TUNING SPECULATION: Experimental Aesthetics and the Sonic Imaginary
November 1-2, 2013: York University, Department of Art and Department of Art History
Apply before June 30, 2013

“Tuning Speculation” will be a two-day conference hosted by the Department of Art and Art History at York University in Toronto from 1-2 November 2013.

Over the past few years, the term “speculation” has become something of a buzzword and has acquired a rhetorical currency that, arguably, owes much of its value to the way Speculative Realism’s agenda to emancipate thinking from a sense of indenture to its own finitude crystallizes a hazy longing in the humanities to invest in something besides the constant deployment of textual strategies and ideology critique. Indeed, a conjectural spirit can be found haunting recent work in feminism, media and animal studies, as well as certain spheres of the social and ecological sciences. However, the force of this speculative thrust has been largely directed towards advancing metaphysical models that challenge the interpretive exception of human experience such that aesthetic figurations, perhaps because the concept of the aesthetic is entangled in the very definition of human being, have been largely excluded from the game. This is lamentable because the speculative venture of the humanities shares much in common with experimental art practices where “an act the outcome of which is unknown” is the not the goal but the very point of departure.

This two-day conference will therefore address the idea of a speculative aesthetics and propose ways of tuning speculation to its imaginative and experimental principle. While several approaches can address the exclusion of the aesthetic from expressions of the current speculative attitude, we propose to concentrate on the sonic arts as an initial point of entry for the reason that the sonic arts reply on a constitutive conceit and effective imaginary that claims access to a material reality which can only be conceived through a rhetoric of immersion and immediacy. In this respect, we suggest that sound art, in the widest sense of the term, pressures the conceptual disconnect between the essentially fantastic gesture that speculation is and the necessary veracity that any realism or materiality demands.

Abstracts (300-500 words) for 30-minute papers from scholars/writers/artists in any relevant field are welcome. We are especially interested in presentations that recognize the necessary intimacy between speculative theory and fiction (in the broadest sense). Please send abstracts, along with a brief biographical details and contact information, to unsound@yorku.ca by 30 June 2013.

Participants will be informed of acceptance by 8 July 2013.
December 4-5, 2014: University of Edinburgh
Apply before October 31, 2013

The conference will examine the theme of human-animal relations and related topics, such as race, sexuality, zoology, natural history, theological and philosophical perspectives (to name but a few), between c.1500 and the publication of Darwin's Origin of Species (1859). Early-career scholars are particularly encouraged to submit proposals for papers. It is intended that an edited collection of selected papers will be prepared for publication.

Anticipated themes of the conference may include:
- Human-animal relations of all kinds
- Philosophy, religion, and intellectual history
- Consciousness, sentience, language, and the soul
- Bodies, human and animal
- Animals and people of the New and Old Worlds
- Classification
- Breeding and nationhood
- Race
- Exotica and exploration
- Collecting and exhibiting
- Curatorship
- Fairs, freakshows and buffoon

We are also particularly interested in papers discussing how we attempt to do the history of human-animal relations today.
- What is the state of the field?
- What are our methodologies?
- What problems do we encounter? How can/do we overcome them?
- Why study human-animal relations?
- What specific social, cultural, political, intellectual (etc.) consequences are there to this branch of intellectual inquiry?
- What can we learn from other disciplines in the humanities and social sciences?
- How can we work with the natural sciences?
- How do we teach this history?
- How do we communicate or show this history beyond the classroom, for instance through public events, broadcast media, the arts, or exhibitions?

Please submit a 250-word abstract and a brief biographical note or one-page CV to the organisers: Andrew Wells (andrew.wells@ed.ac.uk) and Sarah Cockram (s.cockram@ed.ac.uk) by 31 October 2013.

http://www.apesandangels.ed.ac.uk
Seance, Emily Daina Šaras, 2013.
SUGGESTED FURTHER READING: SCIENCE STUDIES AND RELATED DISCIPLINES

The Editorial Team of PULSE has collected the following resources in the hopes that they may serve as further reading for those interested in learning about the interdisciplinary nature of Science Studies. May they serve as stepping-stones for readers to engage with this discipline and to craft novel contributions for upcoming issues of our journal.

RELEVANT TEXTS


LINKS
THE CULTURAL CHALLENGE TO SCIENTIFIC KNOWLEDGE
http://sciencewars.tripod.com/cult.html
FEMINIST SCIENCE STUDIES: STANFORD UNIVERSITY
http://plato.stanford.edu/entries/feminist-science/
HANDBOOK OF SCIENCE AND TECHNOLOGY STUDIES
https://www.facebook.com/MatteringPress
HISTORY OF SCIENCE SOCIETY
http://www.hssonline.org/publications/NonWesternPub/intro.html
THE IDEA OF INNOVATION PROJECT
HTTP://WWW.CSIIC.CA/
THE INCOMMENSURABILITY OF SCIENTIFIC AND POETIC KNOWLEDGE
http://www.oikos.org/vGknowl.htm
READING THE HISTORY OF WESTERN SCIENCE
http://depts.washington.edu/hssexec/library_list.html
SCIENCE AND TECHNOLOGY STUDIES JOURNAL
http://www.sciencetechnologystudies.org/
SCIENCE AND TECHNOLOGY STUDIES WIKI
SCIENCE STUDIES NETWORK
http://depts.washington.edu/ssnet/index.php
SCIENCE, TECHNOLOGY, AND INNOVATION STUDIES JOURNAL
http://www.sti-studies.de/ojs/index.php/sti
SOCIOLOGY OF SCIENTIFIC KNOWLEDGE: UNIVERSITY OF CAMBRIDGE
http://www.hps.cam.ac.uk/research/ssk.html

FACEBOOK PAGES
DISSERTATION REVIEWS: https://www.facebook.com/dissertationreviews
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