Abstracts

Society for Social Studies of Science
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1.1 The Local/Global Politics of Regenerative Medicine

Organizer/chair: Herbert Gottweis
University of Vienna
Catherine Waldby
University of Syndey

During the last decade, regenerative medicine has become a highly contested socio/political/scientific field. In particular advances in stem cell research have led to world-wide patterns of conflict and controversy. At the same time, regenerative medicine has become become the topic of comprehensive state research support and regulation. The proposed session looks comparatively at regenerative medicine as an emerging scientific-technolgical field, and its political economy and emerging regulatory patterns. In particular the tensions between global and regional tendencies in reseach policy and regulation will be in the focus of this session.

Catherine Waldby
University of Sydney

Regenerative Medicine and the Global Tissue Economy

Many of the disciplines involved in regenerative medicine rely on female reproductive biology and donated tissues (embryos, oöcytes, cord blood), placing a heavy onus on female populations as donors. While embryo donation and circulation for stem cell research is generally well governed, both oöcytes and cord blood circulate in unregulated markets in many parts of the world, with little scrutiny or social control. This paper will focus on the possible impacts of Somatic Cell Nuclear Transfer (SCNT) on the existing global market for reproductive oöcytes, and suggest some ways to improve both global governance and the protection, security and power of oöcyte vendors.

Melinda Cooper
University of East Anglia

The Politics of Regenerative Medicine in China: Global, National and Local

his paper analyses the political dynamics that have shaped regenerative medicine in contemporary China, focusing on the interaction between political and economic forces at different levels: global, national and local. These dynamics form the basis for a political economy analysis that can explain the motivations underlying Chinese investment in the science and technology of regenerative medicine, as well as the broader (strategic) policy framework for developing regenerative medicine and exploiting its commercial potential. China has made major investments and significant progress towards developing cutting-edge research in regenerative medicine. Based on documentary and interview evidence, I argue this investment is best understood as part of China's developmental strategy for its economy, not as part of healthcare policy. (China's investment in regenerative medicine contrasts with the lack of public investment in China's healthcare system: the system has deteriorated to crisis point, with a growing proportion of the population unable to access basic services.) This developmental strategy is driven by the interaction between global, national and local political economies: China's national government is developing a "national innovation system" as a strategic response to competitive pressure from the global economy and China's powerful provincial governments have done likewise, investing in their own "regional innovation systems", competing with each other and with other high-technology regions around the world. Regenerative medicine plays a central role in this developmental strategy because, as a new area of technology, it presents a tremendous opportunity for an emerging economy to compete with traditional centres of innovation in the developed world.
China's policy framework for regenerative medicine is shaped by developmental goals: policy strategies are aimed at capturing potential economic rewards, with an emphasis on translational research and technol

Nik Brown
York University

The Privatised Consumption of Bioscience – the Politics of Commercial Cord

This paper explores new forms of consumption in the biosciences that directly link consumers with a new range of clinical services. The case of cord blood banking sits alongside other forms of direct consumption including, for example, an expansion in privatised fertility services, therapeutic stem cell tourism, self medication, etc. In turn, this denotes a changing formulation of the role of the state in the supply, regulation and oversight of the relationship between consumers and an expanding bioscience services sector. Commercial cord blood banking has expanded considerably over recent years, enabling new parents to pay to have the stem cells of their newborn children preserved for future treatments, should the need (and indeed opportunity) arise. This is one of the few areas where consumers are actively engaged in the public consumption, and rearticulation of, the stem cell vision. The paper elaborates on the politics of expectations in cases of this kind, and reflects on the emergence of prospective future-oriented engagements with new biosciences services.

Herbert Gottweis
University of Vienna

Regulating Stem Cell Research in the Global Arena

This paper analysis the tension between local trend towards human embryonic stem cell resarch and efforts towards establishing a global regime of stem cell research. Different efforts towords transnationalizing stem cell regualtion such as the UK stem cell bank regulatory strategy and the activities of various international scientific organizations are discussed. An assessment is given which how stem cell regulation integration could operate in the global arena

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Democratizing Science? Stem Cell Research in Canada

This paper explores how political and moral constraints in the Canadian context have shaped the context within which stem cell scientists work. One potential outcome here is a democratization of science, as scientists respond to the policy context through the creation of open models of collaboration, and as Voluntary Health Organizations (VHOs) play a significant role in developments. Recently, Canadian VHOs, as is the case in other countries, have responded to the promises and potential of new developments in Regenerative Medicine, especially stem cell research. Through partnerships, these organizations have funded research and promoted legislation that would facilitate stem cell research. However, critical moral stances continue to be influential: e.g., pro-life groups routinely promote their views to proponents of research, even after legislation has passed. As a result, other actors, including VHOs and scientists, are more likely to form strategic partnerships, often moving forward cautiously, and, in many cases, favoring a more moderate approach than is prominent in other national contexts. These conditions also help to provide a collaborative environment for scientists. These developments continue to influence stem cell research in Canada. Interviews, organizational texts, and scientific documents are the main sources of data for this analysis.

Discussant: Linda Hogle
University of Wisconsin

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1.2 STS & Information Studies I: Cyberinfrastructure / e-Science

Organizers: Jean-François Blanchette
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Geoffrey Bowker, Santa Clara University <gbowker at scu dot edu>
Chair: Ramesh Srinivasan (UCLA)

While the terms cyberinfrastructure and e-Science appear to have originated in science and engineering, information studies scholars have made these terms their own. These are inherently information-based entities. Cyberinfrastructure is explicitly about building an infrastructure that is information- and data-intensive, distributed, and collaborative. E-Science is explicitly about new ways of doing science, all of which require more information and data, connectivity, and collaboration. These panelists will explore the particular perspective that information studies brings to cyberinfrastructure and e-Science, including theories, research questions, methods, and variables. Collectively, the panelists span a range of disciplinary training that converges in information studies. Expertise includes sociology, history, communication, computer science, and human factors.

Paul Wouters, Anne Beaulieu
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Changing Practices, Telling Stories, Building Tools in e-research

E-research initiatives are technology-enabled interventions in current research practices. These interventions are justified by the hope that e-research infrastructures and tools will foster new venues for researchers and scholars. This triggers a complex interaction between hope, hype, and accountability. In this presentation, we focus on how we are using and developing STS expertise in order to pursue reflexive analysis along with design of new e-research scholarly practices. More specifically, we consider the tensions involved in pursuing three kinds of activities around e-research: changing practices, telling stories and building tools. These tensions take on different shapes in different fields. In our presentation we will focus on specific episodes in the humanities and interpretative social sciences: digitization of cultural heritage, hybrid social science databases, and the creation of visualization and collaborative environments. This kind of nexus is exemplary of the types of challenges that researchers will experience in e-social science and e-humanities, and that scholars will encounter in the study of cyberinfrastructures as tools for new ways of knowing.

David Ribes
School of Information, University of Michigan

Consequences of the Long-Term Today

The notion of infrastructure evokes the image of creating and sustaining a ubiquitous, persistent and reliable environment. In planning such 'long-term' infrastructures participants encounter multiple difficulties: how to design an infrastructure for shifting scientific methods? How to secure the continued commitment of participants? And, how to ensure the perseverance of the infrastructure project in the face of changing technologies, emerging standards and uncertain institutional trajectories? Drawing from ethnographic research in multiple scientific cyberinfrastructure projects (GEON, LEAD, WATERS, LTER to name a few); this presentation will explore 'the long in their terms'. In each of these projects geologic, atmospheric, and environmental scientists, respectively, define a vision of long-term development which ranges from five years to centuries. Each of these spans of time are matched with strategies for securing the commitment of participants, planning for changes in institutional funding regimes, or coping with shifts in information technology. I will outline actor's definitions of long-term infrastructure development and the strategies which they have developed to accompany them. Regardless of 'long-term success', in planning for the long-term today the practice of science is being transformed. It is in the present that cyberinfrastructure participants are enacting the future organization of science.

Geoffrey Bowker
Santa Clara University

Cyberinfrastucture Studies - Emerging Themes about E-mergent Knowledgescapes

It is rare enough in human history that new ways of working are developed. When we developed speech, writing and printing new forms of action at a distance and over time were rendered possible. It seems natural to complete the tetrad with the Internet. It has become progressively clearer (as we have kept better records …) that each new work mode accompanied – though it is by no means simply the case that they caused - great social, economic and organizational changes.   In this paper I explore the current change in terms of its relationship with the nature and production of knowledge. We move from a definition of cyberinstructure to the adumbration of an historical context for its development to organizational, political and finally ontological dimensions of its development. Most examples will be drawn from scientific cyberinfrastructure, however where appropriate links to knowledge work in the arts and humanities and in business will be made.

Marina Jirotka
Oxford University Computing Laboratory

The Practical Accomplishment of Data Sharing

A key feature and perceived advantage of e-Science technology is the potential for developing a 'commons' of information, data that can be easily accessed and shared

across both geographical and disciplinary boundaries. This very accessibility is seen to offer the conditions for new forms of science to emerge. However, with the completion of the first round of UK e-Science pilot projects, and experiences from cyber-infrastructure projects, questions have emerged relating to this vision of data sharing, fundamentally how it 'fits' with scientific practices. This is occurring at the same time as the extended perspective of 'e-Research' is being proposed to reflect a wider set of research practices embodying business, government, social science and the arts and humanities. As the e-Science vision is expanding into these disciplines and settings, particularly within e-Social Sciences and Humanities, further questions are emerging that seem to challenge the vision of the unproblematic sharing of data. These issues do not seem to fall neatly into the remit of conventional Usability, though often the difficulties surrounding uptake of technologies are explained and accounted for in terms of users' lack of training in the new technologies, or their resistance to changing work practices. In this paper I will draw upon various case studies of UK e-Science and e-Social Science/Humanities projects to outline key issues that are emerging. These suggest the need to reconsider our assumptions and conceptions regarding the nature of sharing scientific research information and its corresponding impact on practice.

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The library on the screen: Contested infrastructures for knowing in the pre-Web era

Starting in the mid-1990s, the World Wide Web, the Digital Library Initiative, and the Google Books Project all helped to redefine the "virtual library" as a global collection of spatially distributed but temporally instantaneous multimedia information resources. But during the two decades preceding this technological convergence, the relationship of the library to the "screen" was the topic of much experimentation and concern among working librarians in the US throughout a diverse spatial and social division of labor. School librarians were wrestling with off-the-shelf CD-ROM software and the expensive hardware required to access it; public librarians were installing the first online public access catalogs (OPACs) within their buildings, a screen-based representation of data previously available only within the physical card catalog; and university librarians were investigating the power of screen-based data query and retrieval services over local- and wide-area computer networks. This paper highlights several ways that "the library on the screen" was imagined and prototyped, produced and consumed, over an uneven landscape of librarianship during the pre-WWW era. In each case, the space-time changes wrought by the shift of both data and metadata from physical, printed artifacts to virtual, digital forms had profound effects on the meanings of both library use and library labor.

Les Gasser (invited discussant)
University of Ilinois, Urbana-Champaign

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1.3 Ways of Knowing the Biomedical Body

Organizer/chair: Ericka Johnson
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Rachel Prentice, Department of Science & Technology Studies, Cornell University, USA

Our bodies often remain relatively invisible to us until something that
happens that brings them to our attention, such as when we become sick or
injured. Often, these moments bring us into the medical system where it is
another's job to tell us what is going on with our bodies. These others
include people and machines that tell us about our bodies using
descriptions and inscriptions. This panel explores the relationship that
develops among practitioners, machines, and patients and the ways of knowing
bodies that machines suggest. Papers in this session show the actors and interests that
create scientific instruments to measure the body; examine how simulators show us how
we should know a body; look at how emotions and technologies work together in
dramatic moments of birth; and examine controversies surrounding cadaver dissection as
a means of knowing the human body.

Elin Bommenel
Department of Service Management, Lund University, Sweden

From insecurity to security. The process of creating an instrument

This paper maps the way from insecurity to security in the translation from nature (in this
case the caries cavities) to printed research results. What observations were put aside as
anomalies, what observation counted as real, and thus desired observations? How did
these choices affect the construction of the instrument, and thus the definition of what
was possible to see and what the researchers wanted to see? The study shows the
production of scientific instruments as an ongoing process where more than scientific
results are produced and confirmed: common understandings and metaphors supported,
as are the interests of those financing the research, and individual scientific roles,
professions, and careers. The work is based on extensive archival material.

Ericka Johnson
Dept of Technology and Social Change, Linköping University, Sweden

Mapping medical experience. Simulators and the reconstruction of knowledge about the
body

When simulators are used to supplement training on patients, the patients participation in
medical practice is silenced. Applying Barads theories about intra-action and agential

reality to the case of a gynaecological simulator, this paper suggests ways the patients experience of medicine can be included in simulator design. Understanding medical simulations as reconstituted practice rather than representations of human anatomies points to the political importance of asking whose experience is being represented by the simulator. Work with a gynaecological simulator and professional patients suggests that women experience gynaecological exams in ways not measured nor addressed by the gynaecological simulator. This paper asks how incorporating these experiences would change the simulator. Emphasising the importance of experienced medical practice as a phenomenon of knowing creates a discursive space in which to talk about the value of including the patients experience of medical practice in simulator design.

Petra Jonvallen
Dept. of Gender and Technology, Luleå University, Sweden

Overcoming the abject. Identifying with the woman while monitoring a foetus

This paper investigates the concept of abjection (Grosz 1990) in relation to introducing new technological devices into birthing practice and draws from examples emanated from fieldwork performed in a Swedish university hospital birthing centre where a new foetal monitor is being introduced. Notions of the abject in relation to the birthing woman and the foetus respectively are investigated. The abject is further analyzed in relation to the work practices of midwives and doctors and situated in the delivery room and in the conference room where rounds take place. The argument put forward is that overcoming notions of the abject is done through the engagement in an often dramatic birthing process and the consequent identification with the birthing woman. How this relates to new technological devices in birthing is discussed.

Rachel Prentice
Cornell University, U.S.A.

Cutting Dissection: Anatomy Teaching and New Tools for Knowing the Body

Cadaver dissection is among the first rites of passage most medical students undergo. The lessons that this complex practice conveys are instrumental, particularly the language and structure of the human body, and emotional, including exposure to death and development of an affective stance toward the body. But cadaver dissection is also a contested method of learning anatomy. Medical schools are doing away with dissection in favor of demonstrations, computer programs, and plastinated specimens. This paper examines controversies surrounding dissection, considering the relationship of traditional dissection to new technologies within the context of a changing world of medicine, medical technologies, and ways of knowing bodies.

Rachel Washburn
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Human Biomonitoring & the Lived Experience of Body Burdens

Recent advances in the field of analytic chemistry have facilitated the measurement of low-levels of a wide range of xenobiotic compounds in humans with increasing precision. The process of collecting and analyzing bodily fluids and tissues for the presence of biological markers, or biomarkers of chemical exposure, is called biological monitoring, or biomonitoring. By providing direct measurements of human exposures to an extensive array of compounds, previously undetectable in humans, biomonitoring is anticipated to significantly contribute to understandings of the chemical causes of a wide range of health problems, including breast cancer and infertility. However, as many scholars have demonstrated, tests that reveal genetic, biological, and other sorts of health related information are often fraught with complexities and ambiguities. While biomonitoring is not yet considered a "medical technology" per se, I argue that in revealing the presence of chemicals residing within the body, that could cause or be linked to health problems, it very much resembles other health related diagnostic programs. As such, disclosing biomonitoring results to individuals raises some important questions, including the ways in which such information is communicated as well as its bearing on individuals' understandings of health, illness, and risk. This paper presents data from 20 in-depth interviews with women who had recently undergone blood mercury screening. Analyses reveal that receiving such results serves to make environmental health risks "real" in new and increasingly individualized ways.

Discussant Natasha Myers   MIT, U.S.A.

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1.4 Knowledge for Governing Science

Organizer/chair: Sabine Maasen
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Peter Weingart, Institute for Science and Technology Studies / University of Bielefeld,
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The post-war 'social contract' between science and society has come to an end: One of its central elements had been the institutionalized trust in the self-regulating mechanisms of science assuring the prudent use of public funds and the ultimate utility of research for the common good. The erosion of this guiding principle gave way to a 'new deal' between science and society, basically resting on two ideas: First, universities should become both efficient and responsible actors. Second, science should be regulated so that its knowledge production would serve the common good either by excellence or engagement of the public. This, in turn, led to the (further) advancement of practices reassuring the special quality of universities and science, respectively: ratings, rankings, evaluations, social validations. They are indicative of novel ways of knowing in the governance of science insofar as they respond to the intensified political call for transparency – however flawed, dysfunctional, or illusive these practices turn out to be.

Sabine Maasen
Science Studies Program / University of Basel

Excellence and/or Transdiciplinarity: Which Knowledge Do We Want?

Growing market pressures on universities currently challenge the production of scientific knowledge: On the one hand, competition among enterprising universities is meant to produce excellence as well as respective measures to evaluate the outcomes and rank universities accordingly. On the other hand, the call for more 'robust', relevant, and publicly responsible research is tantamount to producing transdisciplinary knowledge that is 'socially validated' by extra-scientific actors. These two principles governing knowledge production are related to one another, albeit asymmetrically. Trans-disciplinarity is never supposed to produce excellence, whereas excellence is often conceived as a cooperative effort between disciplines and extra-scientific stakeholders such as firms, political actors, etc. Excellence and transdisciplinarity thus represent two rather distinct ways of producing 'good knowledge', either by way of including the public (constituting networks of mutual learning) or by way of including expert knowledge holders (constituting networks of excellence). This indicates a split discourse about the 'quality' of scientific knowledge: While transdisciplinarity argues with the local applicability of knowledge, excellence argues with innovativeness. Common to both types of knowledge, however, is their ultimate target of advancing the common good, either by participation (transdisciplinarity) or by highly competitive knowledge (excellence). The talk will explore this argument based on empirical research.

Peter Weingart
Institute for Science and Technology Studies / University of Bielefeld

Creating Knowledge about Elite / Elite Universities: Rankings and Their Institutional Impact

Universities, (this applies mostly to European universities) for a long time, insisted on receiving more resources in order to improve their performance, and governments reacted by asking for more 'value for money'. A certain immobility prevailed. However, things changed with the political demand for transparency and the introduction of rankings. It was the media, not the universities themselves, that responded first to the call for transparency: Rankings of teaching and research (among German, European, and/or international universities) became 'news value', whether the universities like it or not. The crucial condition for rankings to be effective is that they can inform an organization so as to adapt its behavior accordingly. As an instrument for efficient, knowledge-based governance it needs to refer to dimensions that the organization (here: a university) can influence. However, most rankings do not meet this condition. Instead, they have led to a series of unintended reactions, both on the level of individual and organizational behaviors that can be summarily called 'goal displacements'. The talk explores some of these adaptations and their impact on knowledge production.

Torsten Strulik
Department of Sociology / University of Bielefeld

Knowledge, Ignorance and Communication. Sociological Perspectives on Scientific Evaluations

The modern society is reacting to a self-produced intransparency by the introduction of evaluations. From a theoretical point of view, this form of societal adaptation brings about questions of how the emergence of evaluative organisations and mechanisms can be explained in detail and which functional requirements will be met by them. In this context and by the example of scientific evaluations I want to focus on three interrelated aspects: (1) Evaluations react to the increasingly important demand of explicating knowledge for purposes of governance. It seems to be characteristic for the modern society to take implicit, unspoken and traditional knowledge as an object for strategies and mechanisms of explication. (2) Evaluations are in line with a 'managerial style' of handling ignorance (resp. uncertainty, complexity, intransparency). The growing importance of evaluations illustrates that a transition from a reactive to an active treatment of ignorance is taking place in modern society. (3) Evaluations are producing illusions of security and thereby enabling risk communications. Thus, under the aspect of latent functions evaluations are not only producing unintended consequences, as often illustrated. They are also protecting communications against problematisation and destabilisation.

Martin Reinhart
Science Studies Program / University of Basel

Peer Review. How Knowledge About Quality Comes About

Peer Review is viewed as one of the central mechanisms in science for assessing and furthering quality of scientific work. In the case of editorial peer review the main challenge lies in assessing work that claims to be new and innovative. These assessments are inherently uncertain because they take place on the border of what we already know and what might be added as new and interesting knowledge. Peer Review as a social institution controls and reduces this kind of uncertainty by offering an assessment procedure that enables reaching decisions routinely. In addition peer review also certifies new knowledge and generates trust in it. In the related case of science funding uncertainty is even more problematic because the scientific work that has to be assessed is not even performed yet. The judgment here can not be about quality but about a potential for quality. Thus peer review in science funding organizations has to serve an additional function by bridging the gaps between assessments of previous work, the present proposal and the chances of future success.

My talk will show how these kinds of decisions are reached by analyzing empirical material - the internal documentation of funding decisions - from a science funding organization. I will argue that new demands traditionally not rooted within scientific goal orientation e.g. for more transparency or transdisciplinarity can pose problems for established peer review procedures.

Michèle Lamont
Department of Sociology / Harvard University
Department of Sociology and African and African-American
Studies, Harvard University

"A Pragmatic Approach to Evaluating Quality in the Social Science and the Humanities"

"This paper draws on evidence presented in my forthcoming book Cream Rising to systematize a theoretical approach to the study of quality that draws on symbolic interactionism, the pragmatic turn in sociology, as well as the literature on boundary work. Whereas the earlier literature on peer review focused on final outcomes and consensus, I develop a Goffmanian approach to understand the process of negotiation in peer review panels, the constraints that meaning-making, interactions, and networks create for evaluation, and customary rules of evaluation."

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1.5 Climate Change
Chair: Elizabeth Hartmann
Presenters: Elizabeth Hartman, Maxwell Boykoff, Mike Goodman, Jasmin Sydee, Roger Chen

Elizabeth Hartmann
Director, Population and Dev Program, Hampshire College
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Refugees and Rebels: Who Gets to Shape the Discourse on Global Warming?

As evidence of climate change becomes ever more compelling, struggles over who gets to frame its causes, effects and solutions are intensifying. In environmental and security circles, alarm is building over the prospect of 'climate refugees' whose forced migration poses a potential threat to economic and political stability. The term 'climate refugee' shares much in common with the problematic concept of 'environmental refugee' so popular in the 1990s which served to naturalize the social inequalities at the root of environmental degradation, pathologize migration, and homogenize diverse populations. In the field of environmental security, 'environmental refugees' were also viewed as a dangerous threat to national security. Today we are witnessing a similar phenomenon as a Pentagon report warns of starving waves of global warming refugees washing up on our shores and prominent environmentalists like Al Gore and Lester Brown use fear of 'climate refugees' – referring mainly to poor black people displaced by hurricane Katrina -- to drum up implicitly racialized alarm over global warming. This paper challenges the notion of 'climate refugees' and addresses the need to develop other ways to view those who are placed at most risk by climate change due to pre-existing social and economic vulnerabilities.

Maxwell Boykoff
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Battlefields of Knowledge regarding Anthropogenic Climate Change: Science, Media, Policy, Public Discourses in the United States and United Kingdom

This paper undertakes an analysis of various facets of climate change discourse – within and between the United States (U.S.) and the United Kingdom (U.K.) – by examining interactions between climate science and the mass media. Through these relations, the research also examines concurrent influences and feedbacks at the interface with climate policy and the public sphere. Media coverage significantly shapes public understanding of climate science. However, different country contexts – amid a complex web of factors – contribute to divergent priorities and processes between climate science and media communities. This project explores the extent to which 'different ways of knowing' elements of climate science – from consensus views to dissenting climate 'contrarians' – have gained salience through media representational practices. It also examines factors that have impeded more widespread public understanding of the causes and consequences

of anthropogenic climate change, and connected pressures for enhanced policy cooperation. These are analyzed through recent coverage of anthropogenic climate change in the Independent (and Sunday Independent), the Times (and Sunday Times), and the Guardian (and Observer) in the U.K and the Lost Angeles Times, the New York Times, U.S.A. Today, the Wall Street Journal, and the Washington Post in the U.S.A. Analyses also draw upon interviews with key actors in climate science and the mass media. Ultimately, this paper pursues these case-studies – and interactions therein – as a basis for further critical analyses of the ongoing communication of science via mass media.

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James Martin Fellow
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"Celebrity Is A Bit Silly, But It Is Currency, Of A Kind": A Consideration Of The Changing Nature Of Celebrity Politics, Media, And Climate Change Science

While discourse on climate change has gained more traction in the public domain, celebrity involvement in this critical issue has also been on the rise. From musical groups promoting 'carbon neutral' tours, to actors and former politicians producing, narrating and starring in big screen global warming feature films, high-profile personalities have undertaken efforts to amplify concerns about human contributions to climate change. Simultaneously, celebrity politicians and politicised celebrities are at the centre of the public debates over the variety and extent of climate change mitigation and adaptation actions.

This paper examines how the (de)legitimisation of celebrity politicians and politicised celebrities influences unfolding discourse on climate change. Moreover – situated in contemporary (consumer- and spectacle-driven) carbon-based society – we interrogate the various effects that this particular set of personalities has on debates over climate change causes, consequences and action. In short, how might the entry of celebrities into debates over science and development be merely 'silly', as Bono puts it, or be a possible 'currency' for the popularisation (and politicisation?) of global problems to an otherwise media-hungry public in the North?

In theorising across the wide fields of cultural and media studies, geography and science studies, we seek to tease apart some of the promises, pitfalls and contradictions of this increasingly entrenched set of iconographic 'actors'. Thus, ultimately – as a form of climate change action – we ask, is it more effective to 'plant' celebrities instead of trees? Or are we left with the figure of the 'inconvenient' celebrity as just one more spectacle to

gaze at as they parade across the 'red carpet' of environmental and development-related causes?

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Adapting to Change: The Politics of Climate Science-Policy in the Pacific Islands Context

Whilst global knowledges, processes and agendas are highly influential in shaping the character of Pacific regional action on climate change, the particular characteristics of Pacific political culture, including decision making characterised by a small expert elite, the continuing strength of Pacific chiefly and land tenure systems, small debt economies and limited resources for endogenous scientific activity, create a very particular context in which research and policy is developed.

Participants in the Pacific climate policy domain often demarcate between 'the science' and 'the policy', insisting that better communication is needed between these two spheres to further a strong response to climate change. Yet this boundary is in many ways rhetorical, with expert community at the regional level being greatly integrated. For example, scientists may also be policy makers, or scientists may shift between 'hard scientific' and social analysis seamlessly within their analysis without qualification. There is also a strong consciousness amongst indigenous and non-indigenous decision makers/experts about the continuing primacy of Pacific cultures and local knowledge, and decision makers/experts play a significant role in negotiating between various and competing/overlapping ways of knowing and relating.

Out of this more complex relationship between science and policy, a number of quite pervasive narratives and discursive patterns about climate change have coalesced, including a shift from representing climate change as a threat to the very habitability of the Pacific, to critical hazard to be adapted to in the course of development. This paper will examine examples from documents and interviews to highlight some of the ideological assumptions and normative commitments that become naturalised in technocratic language.

Roger S Chen
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Knowledge System and Glocalization: Mapping Taiwan's Climate Change Research and Local Response

The concept of 'knowledge system'is recently highlighted by various international organizations and academies predicated on the recognition that the linkage between

knowledge production, application and diffusion has to be enhanced if firm and enduring local response is to be realized in dealing with global environmental issues. Knowledge system, emphasizing the connection between 'sustainability science' and 'local knowledge', offers an insightful mean to reveal the state and flow of scientific knowledge that affect local response to global environmental issues. Drawing on the notion of knowledge system this study uses network analysis to exam Taiwan's knowledge production and diffusion on climate change issue, an issue that has already became the most pressing agenda of global environmental governance but somehow remotes to the daily life of local citizen, well delineating the very argument of 'glocalization'. The investigation mainly proceeds with two parts. For sustainability science, which represents the upstream resource of knowledge system and the foremost pillar for upholding sustainable development planning, scientific research is measured to detect its role in translation from knowledge to action. For the domain of local knowledge, this study gathers issues and rhetoric proclaimed by advocators and officials in media and web at salient events concerning climate change and analyzes them to show how the cognition of climate change and the legitimization of local response are depicted on the basis of scientific facts. The underlying presumption is that enduring local response and public recognition of environmental vulnerability are more likely to be legitimated and activated by local-related research issues than those broad climate phenomena announced by local and international science community.

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1.6 Translating Knowledge, Transgressing Boundaries: An exploration of cultures and practices underlying the conversion of biomedical knowledge

Organizer/chair: Norbert W. W Paul
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Science, medicine, culture, and society are mutually dependent in manifold ways. However, it is quite difficult to make sense of the ways in which scientific and biomedical knowledge migrates between socio-cultural contexts or translates into socio-cultural practices, where it is absorbed by our socially molded bodies and becomes – as embodied knowledge – part of ourselves. This is not a one-directional transfer, as this highly situated knowledge moves back to science and medicine, both of which are to be understood as contingent practices, co-constructed with their social and material contexts. However, the notions of "scientific," "social," and "embodied" knowledge are far more than different representations of one shared "reality". They are intrinsically different ways of knowing, each creating a different ontology. Hence, it is reasonable to ask by which translation processes the boundaries of different realms of knowing are transgressed. This section will explore the conversion of biomedical knowledge with regard to: 1. the transgression of cultural boundaries by translating knowledge from the Western culture into the Islamic culture and vice versa; 2. the conversion of hypothesis-driven biomedical knowledge into technologically constructed knowledge in the field of medical genomics; 3. the translation of technologically constructed knowledge into real-life application using the example of the neurosciences and 4. the translation of socially-molded, embodied knowledge into the realm of biomedicine using the example of gender in medicine.

Rainer Brömer
Institute for History, Philosophy and Ethics of Medicine, Johannes Gutenberg-University, Mainz, Germany

Competing ways of knowing: Translations between European and Middle Eastern civilisations facing Western colonialism (1798-1919)

The instrumental use of selectively translated techno-scientific knowledge has been a characteristic way for non-Western countries of responding to the global ascendancy of European powers in the Old World since at least the early nineteenth century. Against the "transfer paradigm" assuming a one-way transmission and wholesale replacement of "indigenous" ways of knowing, the perspective from non-Western cultures pursuing or accepting Western techno-science has been little researched and poorly understood.

The fate of Egypt before and after the French invasion of 1798 exemplifies the complex interaction between scientific traditions: The collapse of the Mamluk regime and Napoleon's failure to establish a French-style elite gave way to a new hereditary dynasty by Muhammad 'Ali in 1805, who launched extensive projects to appropriate Western knowledge aimed at strengthening his army to pre-empt future European occupation. However, his innovations did not occur in an intellectual vacuum: scholarly traditions in Egypt were alive and well in the eighteenth century, nor did the new, technocratic elite extinguish traditional approaches.

An emblematic figure in this transitional process was the scholar and physician Hasan al-'Attar (d. 1835): member of the learned circles of pre-Napoleonic Cairo, then exiled to Istanbul, where he encountered European medical knowledge alongside the canon of Avicenna. Returning to Egypt, he played an important role advising Muhammad 'Ali's educational projects in competition with the dominant madrasa education, yet he ended his days as director of the madrasa al-Azhar, pinnacle of Sunni learning – a truly hybrid Mediterranean biography.

Respondent: Jamil Ragep, McGill University Montréal

Norbert W. Paul
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The end of scientific revolutions? On data, industrialized knowledge production and new ways of knowing in biomedicine and the life sciences

Four major life cycles of knowledge production and conversion can be observed in modern biomedicine and life-sciences: In the object-driven phase, new objects of research are generated by fitting empirical findings into disciplinary contexts. The move towards the consolidation of a novel field is generally hypothesis-driven. This second phase is often inseparably meshing with the technology-driven, self-supporting and sometimes self-referential refinement of methods, the technology-driven phase. In this phase, techno-science often comes along with an extension of the explanatory reach into other fields of public, social and cultural spheres, creating what has been labelled scientific "exceptionalism". Finally, biomedicine and life-sciences venture into a domain where experimental work becomes more and more data-driven. Technologically constructed experimental systems generate a plethora of findings (data) which at some point require the implementation of novel, data-based tools, simply interpreting the original data on a higher level of integration. The increasing self-referentiality leads to a loss of "external" criteria for the credibility of scientific knowledge, blurring the original hypotheses in a field. The paper examines the conversion of knowledge into data and tools, aiming at a critical reappraisal of the credibility of knowledge in biomedicine and the life-sciences.

Lara Huber
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Exceptional knowledge production? Translating neuroscientific knowledge into "real" life
What are the objects of neuroscientific endeavour and to what extent – if at all – do these objects correspond to mental phenomena: our thoughts, our memory, our selves?

It has been argued that a so-called "exceptionalism" has been created, an extension of the explanatory power of experimental sciences to the fundamentals of (human) life and personal identity. Looking at genetic exceptionalism in the field of molecular genetics and genomics, the question arises if neuro-technological interventions into the brain in turn create "neuroexceptionalism":

Why should knowledge created in genetics, genomics and the neurosciences be privileged over other areas of scientific research on human life and personal identity?

To what extent have experimental designs shaped neuroscientific objects trans-forming complex mental phenomena to mere functional processes of the brain organized in modular structures? Finally, can the framework of experimental neuro-sciences be reliably translated into real life applications? What renders neuronal information exceptional? Is it conceivable that structure (substrate) and function (information) fall into one?

For now, it seems to be reasonable to differentiate between structural and semantic information, because in the field of neuroimaging (mind reading) the latter accounts for personality. Hence, do we need specific concepts to deal with exceptional knowledge production on a scientific, societal and even ethical level? Or is the so-called exceptionalism debate merely a mock battle over the reliability of underlying dogmas, so-called genetic and neuronal determinism?

Antje Kampf
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The absence of male genital cancer: Paradigms of knowledge of gender and medicine reconsidered

In 2000, the first European Male Cancer Research Centre was opened with a declaration of war on the 'undercover cancer' of the prostate ranking second in British and third in German male cancer statistics. Reproduction has been central in academic literature on the political, cultural and social meanings of biomedical advances. The nature of scientific interest in the female body, including cancer, has been widely explored when public health campaigns focused on female reproduction. With the recent awareness of male aspects in reproduction, male genital cancer has curiously still received little attention by patients, by the public and by academics.

The lack of male advocacy groups and of a culture of medical examination and intervention do not sufficiently explain this neglect. In fact, there was an increase of German medical literature about male genital cancer from the late nineteenth century. Using contemporary medical dissertations, medical journals and newspaper clippings, this paper explores the selection of knowledge on male genital cancer in twentieth century Germany. Was the reticence a result of normalisation processes in biomedicine or did scholars and the media make a deliberate choice to neglect male genital cancer? It will research the function of knowledge about male genital cancer in the process of the professionalisation of urologists and surgeons. Why has male urology not created the same impact on patients and the media as did gynaecology? What impact had gender on knowledge production in a biomedical setting of male professionals and male patients?

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Flawed design, terrorist media, (un)conscious patients: The story of hormone replacement therapy after WHI in Turkey

Women's Health Initiative (WHI) was the largest hormone study done on healthy women and it changed the public image of hormone replacement therapy (HRT), women's adoption patterns, doctors' prescription policies, and even the dosage of hormones produced by the pharmaceutical companies all over the world since 2002. In this paper I will look at the effects of WHI study on Turkey. The actors/actants in this story are the WHI trial, the journals that published the trial results, professionals in the field that criticize or support the trial results, the clinicians that "apply" the results to their practice, media as the conveyor of "scientific truth" to the public, and finally, menopausal women that will be using (or not using) the HRT. Every actor is interested in a different part of

knowledge regarding the study; each has multiple sources for the knowledge and a different language for articulating the knowledge they have. In this sense, they constitute different "social worlds" as Adele Clarke puts it. Translation and conflict occurs in every situation that these actors come together, like medical conferences, workshops or visits to the doctor. I will illustrate these "arenas" with examples from discussions in the 2006 conference of European Menopause and Andropause Society (EMAS), a women's health conference, a medical workshop on menopause and ethnographic study of doctor-patient interactions in a menopause clinic in Istanbul.
Discussant: Cornelius Borck McGill University, Montreal / Lübeck Medical School

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1.7 Innovation, Universities, and Industry:
        Chair: Inge van der Weijden (chair)
Presenters: Inge van der Weijden, Dan Burk, Max Munnecke, Ari Tarkiainen, Monika Kurath, Torben Elgaard Jensen

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Implications of research management on academic group performance

An understanding of the determinants of research performance is a prerequisite for designing effective micro and macro research policies. It may give research leaders and administrators tools to attract motivated individuals as well as to achieve organizational and project goals. Furthermore, research leaders and administrators may be stimulated to improve and control research group performance.

This paper will examine the relationship between managerial control and research performance of academic groups. It focuses on Dutch medical and health research groups. The paper addresses the following question: do (certain) research management activities enhance the performance of academic groups? A two-wave longitudinal quantitative study design was used to gather data from research leaders over a period of five years (T1:2002; T2:2007).

Managerial control is considered to be a composite of internal and external control. The focus in this paper is on internal control, which refers to control over resources and research processes. However, some elements of external control are included. We combine objective measures, such as the organization of research management activities (for example, the use of reward practices), with more subjective views and judgments of research leaders about managerial control (for example, about such items as the perceived importance of externally organized research evaluations). In this study we use different performance measures concerning research input and output. These measures concentrate not only on scientific quality but also on societal impact of academic research, which become an increasingly important indicator in both internally and externally organised Dutch research evaluations.

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Technology Transfer Offices as Intersections in Knowledge Production

Since passage of the Bayh-Dole and Stevenson Technology Transfer Acts in the 1980s, technology transfer offices (TTOs) have become increasingly familiar fixtures of research universities in the United States. Such offices ostensibly form a point of contact between academia and the commercial sector, licensing the discoveries of academic researchers out to the marketplace. However, closer observation of university-based technology transfer reveals a kaleidoscope of intellectual, cultural, economic, political, and legal activity, in which several types of actants negotiate collective engagement around the identification, formalization, materialization, disclosure, and dissemination of innovations emerging from academic research. Thus, technology transfer plays a key role in knowledge production processes.

In this paper we discuss findings from an exploratory study of US technology transfer offices. Based on analysis of these offices' annual reports, and web sites, and survey data compiled by the Association of University Technology Managers (AUTM)., our findings indicate that the central activity of TTOs revolves around attempts to align a variety of unruly actants with a broad range of agendas-- including university administrators, faculty members, commercial firms, legislators, taxpayers, intellectual property attorneys, intellectual property laws, and technologies themselves. We analyze the discursive positioning of TTOs in relation to stakeholders internal and external to the university, the TTOs' self-reported aims, actions, and accomplishments, and tensions between these findings. Our preliminary conclusions highlight the complex and sometimes contradictory dimensions of the technology transfer process, and point to the need for more detailed analyses of the interactions surrounding university TTOs.

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Knowing the Future: STS and Business Foresight

Can STS yield valuable business foresight? The paper claims that it has very much the potential to do so. STS can enable companies to understand the underlying dynamics that shape everyday life and markets. These insights are fundamental for companies to foresee market trajectories and envision future innovation opportunities. However, STS research is in general not intended for this purpose. It needs to be re-contextualized and transformed into an operational framework before it is applicable in a business context. To this end, recent interdisciplinary studies in user practices and technological transitions have made great progress by integrating STS with consumption theory, design research, evolutionary economics and innovation theory. The paper presents an operational framework that provides business foresight based on the fusion of the interdisciplinary studies into a united whole. The framework introduces a new analytical perspective on everyday life and markets, and offers a much-needed alternative to the fragmented and superficial trend studies that comprise traditional business foresight. The paper concludes with a discussion of issues related to the implementation of the framework in business context.

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Innovation Policy as Translation from Theory to Practice Rhetorical Perspective to Innovation Policy

The present science and technology policy paradigm applied in all OECD countries as their national policy framework is often called the innovation policy paradigm. The theoretical core of that paradigm might be reduced into two major premises.

The first argument advocates strongly the idea of changing nature of economic development and the role of knowledge and knowing related to that particular science-technology-economy (STE) hybrid as its primary generator. A kind of its epistemic fundament is the idea of re-definition of the mutual relations between those elements within the STE- hybrid. The second epistemic derived from the first premise links the globalization argument with the new political governance framework. The conclusion derived from the paradigm is that the nation states and/or their coalitions must re-structure their political governance practices more responsive to globalization.

This paper focuses on Finland and utilizes the rhetorical perspective as its theoretical and methodological toolbox. The rhetorical perspective is derived from the thematisation of the concept of politics and implies two reciprocal perspectives: the rhetoric in science perspective (RIS) and the rhetoric in politics perspective (RIP).

The RIS perspective focuses on epistemic transition from theory to politics and the RIP perspective epistemic transition from politics to theory. Combining these two perspectives we are able to understand better two big issues in the present science and technology policy: the problem of knowing in politics in general and the problem of translating theory to policy practice in innovation policy in particular.

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Impact of University-industrial cooperation on ways of knowing and academic knowledge production

In November 2006 the public relation office of the Federal Institute of Technology in Lausanne (EPFL) informed on a spectacular contract with its Brain Mind Institute and Nestlé. Nestlé is funding the Brain Mind Institute for research on implications of nutrition on the brain with CHF 25 Mio for the next five years. What is rather new for Switzerland has a long tradition in the U.S.. Since the commercial raise of the field of life sciences in the 1980ies, ways of knowing and knowledge production in this field, are inseparably linked with university-industry cooperation. Beside of a variety of beneficial effects of such public-private collaboration, like research funds and knowledge transfer, they are also critically assessed (Kenney 1986; Krimsky 2003).

In my presentation I aim at focussing on potential problematic aspects such research contracts with industry have on ways of knowing and academic knowledge production in the field of life sciences and plant biotechnology. With the example of a research contract between UC Berkeley Plant Department and Syngenta, I will demonstrate that private interests can affect academic knowledge production and ways of knowing in this field. In particular, science can lose its status as a producer of independent expertise. This leads to a loss of social instances, producing autonomous knowledge and critical assessment of new technologies.

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Knowing the User: The Political Philosophy and the Practical Demands of User-Driven Innovation

In what ways do designers in production companies know the users of their products? And how might designers involve users and their knowledge in the development of future products and innovations?

The paper examines these questions from two angels. First I will discuss MIT professor von Hippels book widely acclaimed book 'democratizing innovation'. The book, I argue, is the latest step in a long series of attempts to give users a voice or a place in the conception and development of new products. The book defines a set of roles,

procedures, rights and obligations for users and producers. In this sense, von Hippel implies a particular political philosophy and suggests a vision of how an innovation democracy might work.

Second, I present an interview-based case study of a set of practices in a particular Danish Manufacturing firm, which von Hippel and others have pointed out as a best case of 'democratic innovation' in Denmark. The case study suggests some of the practical challenges of running an "innovation democracy". Crucial among these is the management of the long term relationship between the company and key users. Where von Hippel assumes that companies may receive knowledge from users either through a one-off market transaction or as a free gift, the experience of the Danish firm is that user-involvement demands a much more enduring relationship between users and the firm. This relationship involves extended reciprocal gift-giving as well as a measure of mutual identification and co-construction.

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1.8 Crossing Boundaries in E-research
Organizer/chair: Andrea Scharnhorst
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"E-research" is an emerging label for new research practices in the sciences, social
sciences and humanities (Wouters, 2006; Hine 2006, Jankowski 2006), which rely on the
use of digital data, digital tools and innovative methodological approaches that transcend
disciplinary boundaries. In this session we will present several case-studies of e-research
practices in humanities and social sciences, including history, archeology, and linguistics.
The aim is to highlight how ways of knowing are reshaped in the presence of new
research technologies. In particular, we draw attention to the re-appearance of well-
established phenomena in the development of scientific fields, such as
institutionalization, professionalization or specialization and the differentiation between
them. We will follow how the triangulation between different perspectives leads both to a
different interaction between so-called lay persons and experts that influences the self-
image of a discipline (Caljé), and questions "the hierarchy of credibility" (van den
Heuvel). We map the demography of e-social science communities (Lin, Voss,
Halfpenny and Proctor). We look into the co-evolution between research infrastructures
and paradigm shifts in archeology and the role of intermediare institutions for e-
humanities (Dunn). We examine the function of collaboration in the cross-fertilization of
ideas and the emergence of specialist fields around e-science approaches and tools (den
Besten, Fry, Hellsten and Lambiotte). We use the case of digital corpora to discuss how
digitalization relates to ongoing conceptual and institutional reconfigurations of
humanities disciplines (Thoutenhoofd, Ratto).

Charles van den Heuvel
The Virtual Knowledge Studio, KNAW, Amsterdam, The Netherlands

Mapping Historical Evidence - Evaluating and annotating history in maps and
visualizations by experts and non experts

This paper proposes the combination of a two way strategy to come to a critical
assessment of the use of historical sources by experts and non experts when mapping the
city. In the first part we focus on a research project Paper and Virtual Cities (VKS and
Alfa-informatics University of Groningen) that develops methods for annotating and
visualizing historical interpretations of digital town plans and virtual reconstructions of
cities. The ultimate goal of this project is to make choices in the process of digitization
more explicit, allowing an ethical use of historical sources for research and design.
Although the annotation/visualization system allows also non experts to comment, the

software is developed by experts to assess mappings of other experts. As such it stands in the tradition of Monmonier's How to lie with maps and MacEachren's Approaches to truth in Geographic Visualization, in short in the tradition of the disciplines of critical historical cartography and visualization. In the second part we focus on "undisciplined", "non-scientific" approaches. The role of non-experts in mapping history will be analyzed by following an experiment of people suffering from dementia in an elderly home who together with archivists describe old photographs of their neighborhood, hoping not only to restore their own memory, but also to build up a collective memory. Bringing together the evaluations of experts with non experts views raise questions regarding the "hierarchy of credibility" and the editing of these various ways of knowing.

Pieter Calje
Maastricht University, The Netherlands

The Cultural Biography of Maastricht: giving meaning to the past in a digital environment

The City of Maastricht in the Netherlands embarked in 2004 on a new heritage polity, which focuses not so much on musea and the objects they store and exhibit but on the city itself and the stories related to it. Two leading Dutch experts, anthropologist Gerard Rooijakkers and the architecture historian Ed Taverne wrote a program using the concept of the cultural biography, developed mainly in the field of anthropology and archeology. However, it can be applied on a city and its heritage as well. A key instrument in this project is a extensive multimedial presentation which presents the city as a rich web of meaning, and stimulates the attribution of meaning at the same time. Historical experts carefully present the different layers of places by analyzing the changes of function in time. Citizens, who lived in the city, have their own stories related to those places. They are encouraged to tell tell them in the digital surrounding. Urban planners and architects use the rich historical culture of the city in developing plans for the future – and interpret and give meaning to the past at the same time. These plans, and the discussion they stir up, are also included in the multi-medial presentation. The multi-medial presentation aims at ending up in a arena in which meaning is attributed to the city, by experts and non-experts. The aim of the project is to realize this Cultural Biography, and reflect on the process at the same time.

Stuart Dunn
UK Arts and Humanities e-Science Support Centre, Kings College London

The structure is the message: ensuring access and sustainability for archaeological data

The digital age has given a new significance to Marshall McLuhan's famous dictum that 'the medium is the message'. Within digital media, the organization and preservation of new and existing content profoundly affects how that content is perceived, stored and used. In the UK, archaeology illustrates well the proliferation of cultural material online. When searching for digital information, most archaeologists turn instinctively to search engines such as Google, or perhaps repositories such as the UK Archaeology Data

Service (http://ads.ahds.ac.uk/). But there remain highly significant contextual problems with how these data are best a) exposed to the academic community and wider public and b) sustained in a way that they remain usable (and useful). These two problems give rise to three closely linked questions, which this paper will consider:

1) What is the impact of formal methods of describing and linking concepts, such as the CIDOC-CRM and ADS metadata, on digital representation of the archaeological record? How can this impact be measured, or at least illustrated?

2) What can current developments in ontological research contribute to the conceptual organization of archaeological data to ensure its accessibility and sustainability for use, as software, platforms and the data itself evolve?

3) What is the role of support organizations such as the UK Arts and Humanities e-Science Support Centre (http://www.ahessc.ac.uk) in this? AHeSSC is undertaking several initiatives aimed at reducing barriers to uptake of digital resources, and these will be used to provide context to points 1 and 2.

Yuwei Lin, Alex Voss, Peter Halfpenny and Rob Proctor
National Center for e-Social Science, University of Manchester, UK

What do We Know about e-Social Science?

On the website of the UK ESRC National Centre for e-Social Science (NCeSS) <http://www.ncess.ac.uk>, e-Social Science is defined as the use of grid infrastructure and tools within social sciences, and it is claimed that innovative and powerful grid-enabled technologies would advance ordinary social science research practices. Despite the ample hopes and expectations towards e-Social Science revealed in the previous sentence, little is known about how it is perceived in reality. In this paper, we open up the black box of e-Social Science through reflecting on our work at NCeSS. We argue that e-Social Science has different definitions that are situated in the everyday work practices of multiple actors in this community. We explain the frequently used jargon and abbreviations, map the demography of the 'e-Social Science community' (who are the designers, developers, users), the state of art of the technologies, the use cases, and the strategies used to encourage uptake and facilitate development. Our boundary work (liaison with different organisations and individuals in multiple disciplines) will also be addressed to show how collaboration in e-Social Science projects is facilitated. In examining the languages, artefacts, organisations and policies produced and used in the field of e-Social Science from a reflexive perspective, we provide an opportunity for rethinking the meaning(s), value(s) and the future(s) of e-Social Science from the views of both an insider and a boundary worker.

Matthijs den Besten (1), Jenny Fry (2), Iina Hellsten (3) and Renaud Lambiotte (4)
(1) Oxford e-Research Center, UK, (2) Oxford Internet Institute, UK, (3) Virtual Knowledge Studio, KNAW, Amsterdam , (4) SUPRATECS, University of Liege, Belgium

Use of the Internet to trace the interdisciplinary dynamics of emergent fields
The UK e-Science Programme has been a much heralded effort to develop advanced Internet-based tools, technologies, and infrastructure to support interdisciplinary distributed collaborations across the sciences. Since its inception in 2001, the Department of Trade and Industry, the UK Research Councils, and partners from industry have invested over £450 million in the programme. The extent to which e-science initiatives have encouraged interdisciplinary collaborations and subsequent emergence of interdisciplinary specialist fields has not been studied in detail. In this paper we will investigate the dynamics of cross-disciplinary fertilization and emerging interdisciplinary communities in the case of e-science in the UK from the start of the programme. We focus on the (co-)citation and co-authorship networks at two levels of science communication: informal conference papers and workshop presentations as well as formal, published articles in ISI-indexed journals. The aim is to trace the dynamics of the emerging field, and the extent to which these networks converge or diverge. Data collection and analysis is driven by two research questions:

- Is the emergence of a new field linked to field mobility of established scientists from other fields or is it mainly driven from newcomers?

- Is the emergence of a new field coupled to the emergence of new collaboration structures, visible with scientometrics research methods?

Ernst D. Thoutenhoofd and Matt Ratto
Virtual Knowledge Studio, Amsterdam

Contact Zones in Digital Scholarship: Corpus Construction for Spoken and Signed Languages

Corpus linguistics has become a recognisable and coherent form of scholarship, understood as one of the longest term examples of digitalization in the humanities. Its successful adoption of digital technologies is generally regarded as taking mainstream, formal linguistics in a new direction, but it has also been blamed for reducing language to a textual trace, embedding new levels of theoretical and methodological formalisation in corpora as technological objects.

Conversely, sign linguistics is a comparatively young discipline that has retained strong connections with mainstream linguistics, sharing typological nomenclature, and a similar focus on the creation of standard linguistic products such as dictionaries and grammars. However, the creation of a sign language corpus is conceptually, technologically and practically very different from creating a corpus based on the ready availability of digital text, and therefore sign linguistics is poised, through the creation of a different kind of digital-linguistic object, to challenge some of the established features of corpus linguistics as digital scholarship.

In our presentation we apply the anthropological notion of 'contact zones' to better understand how digitalization relates to ongoing conceptual and institutional

reconfigurations of humanities disciplines. By exploring how corpora inflect the contact zone where sign- and corpus-linguistics meet, we examine how epistemic commitments require the adaptation of digital technologies, but also how these technologies work as strategic objects to shift agendas, rework existing cross-disciplinary affiliations and create new institutional constellations.

Discussant: Paul Wouters, Virtual Knowledge Studio, KNAW, The Netherlands

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1.9 Ethics in Practice

Organizer/chair: Christian Toennesen
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Ethics has become an increasingly explicit denominator in ways of being, organising, interacting and holding to account. In line with the overall theme of the 4S Conference - Ways of Knowing - there are multiple avenues to be explored under the rubric of ethics in practice.

Outside the crowded ethical fields, such as medicine, and bio- and nanotechnology, there seems to be little STS research examining ethics as mundane practice. We might expect an STS sensibility to portray ethics in terms of an ongoing achievement involving the orchestration and alignment of materialities, (in)formal accountability systems and ex-/inclusion criteria, and vocabularies. This proposed agenda gives rise to a number of questions:
- What does it mean to be ethical and how do people tinker with, and/or accommodate, competing versions of ethical knowledge?
- How is ethical consistency accomplished within organisational settings?
- What are the methodological challenges faced by researchers who want to study ethics as it unfolds?
- What are the connections, if any, between this ethnographic materialist perspective and the search for "ethical guidelines" – Can STS make practice more ethical?

These are some of the questions to be addressed in the Ethics in Practice session, which invites papers exploring what happens when STS and ethics enter into discussion. The session is open to ethnographic and other empirical approaches, as well as theoretically inclined pieces.

Klaus Hoeyer
Department of Health Services Research, University of Copenhagen

The hip prosthesis between person and commodity

In 2001 the Danish authorities issues a circular stating that gold fillings in teeth and jewellery, which is put into a coffin together with a corpse, belong to the body and should be buried with it upon cremation. According to the circular the precious metal contained in hip prostheses, however, should be viewed as scrap metal and sold to a Dutch company. Not all crematory managers agree with this distinction and in three cases the circular is disregarded and the prostheses buried in the churchyard, because "they are part of the person". In tracing the multiple ways of knowing the prosthesis and by studying how some metals, but not all, acquire personhood this paper explores the emergence of moral concerns as an ethical practice interlinked with policy processes.

Lucy Kimbell
University of Oxford

Practising ethics in rat art practices

This paper provides an account of a live art event in which questions of ethics were centred on the complex interactions of humans, rats, and technologies. The one-day Rat Fair attracted over 500 people and about 30 rats. Fancy rat owners and their ratty companions are typically seen on Saturday afternoons in village halls around the UK where they take part in rituals of judging and competitive play. What was different about this event was firstly, that it took part in a London art venue and involved a wider audience, who do not co-habit with rats and for some of whom this was a spectacle. Secondly, the event was created by an artist after a year-long study of fancy rat fairs and observations of scientists experimenting with rats. Thirdly, the live event involved a number of devices designed by the artist which set up encounters between rats, humans and technologies in novel ways. The "Is Your Rat an Artist?" collaborative drawing system combined humans, rats and software to produce drawings, which were then judged by a curator and a prize was awarded. Other elements included RoboRat racing for children, agility training for rats, a Rat Beauty Parlour, and a demonstration of rats' abilities to memorize location by an experimental psychologist. Each of these elements drew on the artist's observations in the field and in the lab.

The questions discussed in the paper include
- How to orchestrate ethical consistency between all actors involved including humans, rats and software and other devices.
- How to balance questions of ethics with questions of aesthetics
- Why many researchers, including those in STS, expect their outputs to be written rather than performed.

Daniel Neyland
University of Oxford

Using Science and Technology Studies to establish ethical accountability in medical research

Recent years have seen a rapid increase in the amount of funding for research targeting diseases which have hitherto been 'neglected.' This latter term refers to those conditions (such as malaria and TB) which are said to occur disproportionately in developing countries. They remain neglected, it is argued, through the absence of a viable market (i.e. a large enough, rich enough population willing to pay) for future vaccines. With increases in funding has come increasing accountability mechanisms designed to assess: the ways in which research funding has been invested, returns on funding received, treatment of populations involved in testing and the roles of large pharmaceutical firms in research.

These modes of accountability have established particular categories of people and things and particular sets of relationships between those entities. Through (proposed and on-going) accountability systems: populations are defined as beneficiaries, as a focus for surveillance, as an object of research; scientists are defined as heroic, in need of close scrutiny, as focused on traditional academic concerns, as puppets of the pharmaceutical industry; and those funding research are identified as the 'solution,' as politically motivated, as having an interest only in future market returns.

This paper will use vaccine research as a focal point for exploring different modes of scientific accountability. The paper will argue that distinct sets of categorical and relational boundaries between people and things established through modes of accountability can be usefully analysed as ethical constructs. The paper will conclude with an analysis of the ways in which Science and Technology Studies has been invoked in developing ethical accountability.

Christian Toennesen, Steve Woolgar
University of Oxford

It's an Ethical World After All

With an increasing number of activities organised under the explicit label of 'ethics' – at work, at home and in the supermarket – we lack finely grained analyses of the ways in which particular practices and material arrangements are rendered 'ethical' (or 'unethical'). Previous scholarly approaches to ethics and organising have been largely synonymous with that of moral philosophers or ethicists, whose writings exhibit strong prescriptive commitments and a lack of concern for ethics as mundane practice. In response, based on empirical ethnographic studies of an ethical property company, this paper highlights and explores the complexities faced by practitioners who self consciously approach life with an 'ethical' attitude in an 'ethical' setting. In the press of immediate practical concerns, when, how and to whom is something considered 'ethical'? Taking the example of developing an 'ethical' supply chain, the paper explores the multiple registers that are used to determine what is ethical and what is not. In particular, the paper focuses on the problem for participants that it is always possible in principle to ask yet further difficult questions about the ethical standing of a supplier or his/her materials. The analysis proposes that in this situation ethics is made durable, accountable and calculable through the use of chains of reference that run wide, deep and sometimes out of hand.

The paper examines struggles over claims of legitimacy in competing versions of ethical organising, and elaborates this application of the idea of chains of reference, by drawing parallels with four main STS-ish ideas. These are 1) the ethnomethodological precept of inconcludability and members' use of the "etcetera clause" 2) the suggestion by Blum and McHugh that factual acceptance is where people "differentially stop doubting" 3) the idea that chains of accountability can stabilise or disrupt assessments of the adequacy of legal evidence (Lynch and McNally) and 4) the practic

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Knowing ethical subjects? Informed consent and the production of subjects in medical research

Informed consent has become the sine qua non of ethical research. Enrolling subjects in medical research requires that people be given a participant information sheet explaining the research and it risks. They must then sign an 'informed consent' form to indicate that they agree to take part in the research. Thus ethics, in this construction, turns on ways of knowing; on ways of subjects of medical research knowing the risks, benefits, and ethical issues of that research; on ways of them knowing themselves; and on a bureaucratic way of knowing those enrolled have been done so 'ethically'. Based on in-depth empirical research undertaken on UK NHS Research Ethics Committees, this paper describes the production of ethical subject-hood through the documentation used to secure and record an 'informed consent' to take part in medical research.

Alfred Moore
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Public engagement and the framing of ethical concerns in the government of biotechnology in the UK.

I will argue in this paper that an 'ethics regime', characterised by a specific way of knowing about ethical issues in biotechnology, is emerging in the government of biotechnology in the UK. The institutions that make up the UK ethics regime, despite differing institutional designs, share an explicit orientation to ethical and social concerns, mixed expert and 'lay' membership, and a strong aspiration to engage the public and include a wide range of public positions. The ethics regime does not produce definitive answers and communicate them to the public and policymakers, rather it starts debates, emphasises the complexity of ethical dilemmas, and avoids decisive moral judgements.

The explicit focus on ethics and the inclusion of a wide range of value positions clearly addresses a long standing problem of the exclusion of value positions from ostensibly technical policy debates. Yet this paper asks: Are there also new forms of exclusion associated with the ethics regime? Specifically, what kinds of speaker positions are regarded as authoritative? What kind of knowledge is required for a speaker to be regarded as credible? Which forms of argument are regarded as acceptable, and which are not?

This paper reports on research into three institutions, the Human Genetics Commission, the Human Fertilization and Embryology Authority, and the Nuffield Council on Bioethics, which will be described as part of a regulatory 'ethics regime' . It will draw on

documentary research and semi-structured interviews with members of the relevant institutions to reconstruct this emerging politics of ethics.

 END

1.10 Communicating Value through Language: How Language Is Used to Assign Cultural Value to Scientific Knowledge

Organizer/chair: Bernadette Longo
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Knowledge is not discovered, it is made, and in the making, values govern participation and subsequent documentation of knowledge reflects the both the values and the cultural features of the environment in which it is produced. The relationship between this participation and reification can be seen through Wenger´s (1998) notion of communities of practice. Given that even scientific facts are constructed and evaluated through these cultural lenses, the language by which facts are presented provides insight as a reification of cultural values as well as persuasive strategies. This session will explore how language is used by scientists, teachers, and technical communicators to persuade people to assign value to scientific knowledge within cultural contexts. . Participants will explore this social process assigning value from theoretical perspectives underpinning the disciplines of technical communication, knowledge communication, cultural studies, discourse analysis, and new media studies.

Peter Kastberg
Aarhus University

Cultural values in the Ontogenesis of a Technical Text – an anthropological Field Study in a Knowledge Intensive Company

Technical texts have been the object of study for some time; the bulk of these studies, however, have dealt with the technical text as a product, with not much attention given to the conditions of producing technical texts. Even if models of text production within process writing have been developed, and have found widespread recognition and application, it must also be said that the framework for these models traditionally has been that of "creative writing" and not "technical writing". Furthermore such studies prototypically deal with texts produced for educational purposes such as assignments which come from teachers which are texts written by students and subsequently evaluated by the teachers who created them.

A research desideratum therefore arises when it comes to modelling the real-life professional context of technical communication including the wide variety of knowledge carriers and resources that professional technical communicators draw upon when producing texts. Consequently a field study was undertaken in a medium sized knowledge intensive technical communication company. With its point of departure in the notion, that "Anthropologists don't study villages [...] they study in villages" (Geertz 1993:22), the study aimed at documenting, analysing and interpreting real-life conditions of the production of technical texts t known as the „thick description" of anthropology

(Geertz 1993:6). In terms of methods, "participant observation" (Spradley 1980) and "direct, reactive observation" (Bernard 1995) were used.

Bernadette Longo
University of Minnesota

Technical Communication as a Tool for Assigning Cultural Value

Good technical writing is so clear that it is invisible. Yet technical writing is the mechanism that controls scientific systems, thereby organizing the operations of modern institutions and the people within them. The invisibility of technical writing attests to its efficiency as a control mechanism because it works to shape our actions without displaying its methods for ready analysis. When technical writing is made visible for study, it is often characterized as a simple collaborative effort in which writers mediate technology for users. Yet it can also be seen as a mundane discourse practice working to legitimate some types of knowledge while marginalizing other possible knowledges. "Making sense" within a framework of contests for knowledge legitimation is not merely a "kind of collaboration." From a critical point of view, making sense for the victor is not making sense for the vanquished, who might ask why their knowledge was silenced. Rather than existing in a "pure" state, scientific texts participate in tensions within situated relations of power and knowledge—where knowledge legitimation is contested by various interest groups and "making sense" means something different depending on your point of view. To view culture as a "kind of collaboration" works to sanitize what Walter Benjamin described as barbarism inherent in the spoils of war (for cultural legitimation). This paper will explore cultural and institutional tensions that impact the making of scientific knowledge and how technical language works as the lingua franca for assigning value to that knowledge within a scientific economy.

Constance Kampf
Aarhus University

Ways of knowing at the intersection of culture and rhetoric: Engaging, (re)constructing, and communicating knowledge via Web presences

As the internet becomes increasingly embedded in society (Woolgar 2002), the impact of information available on the Web implies an increasing capacity to reflect and affect common knowledge in a given society. Looking at the question of the role writing plays as communities engage in technological and social change in local and increasingly global contexts, writing is approached from a knowledge communication perspective—situating writing as a reification of knowledge processes in discourse communities. Working from Bazerman(1988) and Miller's (1986) definition of writing as social action, and combining it with Wenger's (definition for communities of practice which relies on participation and reification occurring in conjunction with written documents, we can understand Internet texts as reifications in an ongoing social action of producing knowledge. This study looks at the use of web presences as place for minority voices to

challenge common knowledge and through interaction with elementary school teachers and classes, work at (re)constructing that common knowledge.

Marianne Grove Ditlevsen
Aarhus University

The Annual Report – the Janus Head of Corporate Communication

From a cultural perspective the annual report can be seen as an artefact reflecting the values of a company, and from a communicative perspective it is complex in the sense that it is multi-functional and the many purposes are potentially in conflict. On one hand, it has to give a true and fair view of the state of the company's affairs and on the other hand it must provide a positive image of the company. The annual report is used today as an important part of a company's communication with its external and internal stakeholders (see for instance Lord 2002) and serves various communicative purposes— informative, persuasive, and expressive. Thus, it is no longer just used as a means of financial reporting, but as an important instrument of strategic stakeholder communication of various kinds—the two most important areas of communication in this context being public relations and investor relations. By public relations we mean "a variety of programs designed to promote or protect a company's image or its individual products" (Kotler & Keller 2006: 536), implying that public relations primarily serve persuasive purposes. Additionally, since the annual report is the publication in which companies meet legal financial statement requirements and make financial information publicly available, it is an important means of financial reporting defined as "the communication of information about the financial position and performance of an entity to interested parties" (Laidler & Donaghy 1998: 1) and can thus be seen as an instance of knowledge communication.

Amanda Williams
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Metaphors as tools of translation: What metaphor contributes to understanding and appreciating different ways of knowing

This paper takes up the notion of ways of knowing via a specific channel of how we understand and experience the world: that of metaphor. It begins with a review of the literature on metaphor and puts some order to the divergent interpretations of this concept currently in circulation. Next, I explore how the notion of metaphor can be said to intersect with some of the ideas advanced in articulations of Actor Network Theory (ANT), most specifically the notion of translation. My discussion then turns to a case study of how these concepts can be applied in an empirical setting, as I illustrate how different communities of practice have come to understand and negotiate meaning of a metaphor surrounding a specific government technology policy initiative (the

"SuperNet"). Some of the questions I take up in relation to this case study include: what role does metaphor play in the process of translation; how can we best trace a metaphor's path or journey; and, what is the relationship between the SuperNet metaphor, policymakers, industry players, citizens, researchers and the broadband infrastructure? In addition, I reflect on several of the questions that ANT raises in terms of "ontological politics" such as: are there options in the use of the SuperNet metaphor; do these options really constitute alternative choices; what are the stakes associated with specific uses of this metaphor; and, how might we choose what are the best sorts of metaphors to be used when thinking about information and communication technology policy initiatives?

Discussant: Carol Berkenkotter
University of Minnesota

END

1.11 Institutional Ideologies of Knowing: Perspectives from Eastern Europe

Organizer/chair:
Maria Haigh
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Knowledge can only be acquired through labor of one kind or another, and that work of informing takes place within the context of social institutions. Yet all social institutions are shaped by particular values and assumptions, and reflect the broader ideologies of the societies in which they function. In this panel we build upon the work of authors such as James Scott (Seeing Like a State), Jon Agar (The Information Machine) and Ted Porter (Trust in Numbers) to explore the role of institutions and ideologies in shaping in shaping information work in Eastern Europe, a region notable for the richness and flux of its ideologies and the consequent strains placed on its institutions. Richardson explores the work of an American library pioneer in designing the Soviet library system, exposing surprising ideological continuities between 1930s California and Stalin's Russia. Haigh explores the special social role of libraries in Soviet Ukraine and the problems faced by libraries and librarians in adjusting to post-Soviet society. Caidi discusses the similar transitions taking place during the 1990s in several central European nations. Geltzer and Kuchinskaya both consider medical knowledge during the recent epoch of upheaval in the region. The former examines the institutional politics of information on the health effects of the Chernobyl disaster, and the latter the epistemic challenges faced by medical workers conducting post-Soviet clinical trials. Finally, Popova-Gosart documents the largely tokenistic role played by the inclusion of leaders representing "traditional indigenous knowledge" in international development projects funded by institutions such as the United Nations and World Bank.

John V. Richardson Jr
University of California at Los Angeles

Harriet G. Eddy (1876-1966), California Library Organizer and Architect of Soviet and Eastern European Libraries

If Harriet G. Eddy is recognized at all today, she is best known as the first organizer of California county libraries in the early part of the 20th century as well as the premier promoter of the California Unified Library Plan. She was able to accomplish much of this work, due to the important political connections of her boss, James L. Gillis, California State Librarian and her friendship with Hiram W. Johnson, the Governor of California and United States Senator. Traveling over bad roads and taking the bus, stage coach, steamer or row boat, and even horseback, she successfully organized 40 of the 58 California counties. Effectively, rural outreach was created via the free county library system headed by a strong state library. Eddy may well have been the first in the US to achieve such wide-spread service to such users. However, she is not nearly as well recognized for her work in the Soviet Union, starting in 1927, when Anatoly

Lunacharsky, the USSR's Commissioner of Education, invited her to consult on library matters at the national level. His interest in her methods matched well with the Soviet command and control approach. However, her only English-language publication about this influential work appeared just once--in Library Journal in 1932 as a brief article entitled "The Beginnings of Unified Library Service in the U.S.S.R. " It was written "in collaboration with Mrs. [Genrietta K. Abele-] Derman (1882-1954), director of first Library University," and Mrs. [Anna] Kravtchenko (sic), Department of Education of Russia and director of the Institute of Library Science in Moscow. Thereafter, she became a library consultant to many other European countries including Bulgaria, Yugoslavia, and Czechoslovakia.

Maria Haigh
University of Wisconsin, Milwaukee

Escaping Lenin's Library: Ideologies of Information in Soviet and Post-Soviet Ukraine

David Remnick's captivating book Lenin's Tomb describes a crucial period in the history of the Soviet Union history immediately before, after and during its collapse. The book's title refers not just to Lenin's physical mausoleum, through which pilgrims still shuffled to view his embalmed corpse, but also to the entire Soviet Union, which Remnick believed was trapped in a state of half-life by its refusal to acknowledge its own true history. Since then, the various republics of the former union have gone their own ways, each dealing separately with the wreckage of their shared history and either renovating, reshaping, or demolishing their metaphorical mausoleums.

In libraries, as in the other institutions of Ukrainian society, attempts at bold reform and a decisive break with the Soviet past have struggled against the prevalent culture of passivity and corruption inherited from the Brezhnev era. Ukraine was one of the 15 Soviet republics and was fully integrated within the U.S.S.R, until its collapse. Today, Ukraine struggles quite publicly with the legacy of its seven decades under Lenin's spell. Although the Soviet Union contained one of the world's best-developed library networks, its libraries were charged with a very different task from their counterparts in liberal democracies. Because the ideologies of Marxism-Leninism were woven into every state institution, libraries played an important part in shoring up Lenin's legacy, and librarians were educated to ensure that reading and research was conducted according to socialist principles (Kimmage, 1992). Very often libraries were part of the communist-led cultural and entertainment "clubs" provided by the Ministry of the Interior for the use of members of different occupational groups. Currently Ukrainian is the nation's only official language, but the vast bulk of existing library materials (and indeed library patrons) rely on Russian. One challenge facing library education is the promotion of Ukrainian lang

Nadia Caidi
University of Toronto

 (Re-)Shaping the Information Culture in Central and Eastern Europe

The library is a ubiquitous component of the information environment of any society and plays a critical role in connecting information resources and services with users. Yet, despite their ubiquity and centrality in the production, management and dissemination of information in society, libraries have been largely neglected in many CEE countries. Libraries can play a critical role in political reconfiguration of their nation by building the types of skills and competencies that will empower individuals and thereby contribute to shaping an information culture that meets the needs of the time.

The purpose of this study is to examine the changing role and image of libraries and librarians, along with the overall information culture prevalent in four Central and Eastern European (CEE) countries that were undergoing socio-political changes in the late 1990s. The core question investigated in this article is whether libraries as social and cultural institutions have a role to play in enabling individuals to acquire the types of skills and competencies that extend far beyond the realm of the library walls to encompass practices that translate into various spheres of individuals' lives, including their participation in political, economic and civic life. Interviews conducted in 1999 and 2002 with library policymakers in Poland, Hungary, the Czech Republic and the Slovak Republic shed light on the role of libraries in social and political reconfigurations of their nations.

Olga Kuchinskaya
University of California at San Diego

Ideological Transformations of Knowledge Infrastructures and Production of Invisibility of Chernobyl Radiation Health Effects in Belarus

Following the 1986 Chernobyl accident, the Belarusian government gradually established an infrastructure of research institutions and radiation control centers. Activities and data of the Chernobyl researchers were classified until 1989-1990. In the 1990s, the infrastructure of radiation research and protection continued to be generally non-transparent to the public. What are some of the problems when non-transparent, government-controlled statewide research infrastructure aims to produce knowledge about pervasive and imperceptible radioactive contamination of the environment? Based on historical analysis and interviews with researchers and government officials, I consider instances of restructuring parts of the infrastructure as focal points illustrating the relationship between shifting ideological priorities, infrastructural organization of research, and methodological and theoretical approaches afforded by both ideological climate and infrastructural organization. Chernobyl research has always been a politically sensitive topic in Belarus. A series of economic and ideological transformations that followed the collapse of the Soviet Union, was echoed in changing ideological conceptions of the nature and scope of the Chernobyl problem. These changing ideological priorities have been materialized in a series of changes to the Chernobyl research infrastructure. The trajectories (Bowker and Star 1999) of these infrastructural changes have not been always adjusted to match the character of the research problem, which itself has been changing with time. As a result, potentially beneficial transformations of the research infrastructure and changes in research

methodologies have created areas where possibilities for research have been systematically lost. The paper analyzes these processes as production of (in)visibility of radiation health effects, i.e., production of areas where the possibilities for knowledge accumulation have been precluded, often through ma

Anna Geltzer
Cornell University

Evolving notions of objectivity: changing conceptions of what counts as clinical evidence in 20th and 21st century Russia

This paper examines the changing notions of objectivity in the post-Soviet clinical trials. Following the collapse of the Soviet Union in 1991, the Russian medical system went through a period of profound crisis during the nineties (Venediktov 1999; Field & Twigg 2000). Healthcare funding, which was not adequate during the Soviet period, dried up almost completely, leaving physicians without salaries, hospitals without basic supplies, and the population without access to necessary care. The desperation of this period set off a search for different approaches to everything from institutional arrangements to funding schemes to resource distribution (Hesli & Mills, 1999). The epistemic foundations of Russian medicine also came under scrutiny. What counts as proper evidence, how that evidence gets produced, and by whom are getting redefined. This process of redefinition comes to the fore when one looks at the changing structure of the clinical trial and the changing conventions of presenting clinical trial results.

Ulia Popova-Gosart
University of California at Los Angeles

Traditional Indigenous Knowledge as a Social, Political, and Cultural Construct
Policy in its essence works as a vehicle to disseminate the values of the policies' makers as well as provide a reference point for evaluation and justification of these values.

Policies, which support developmental projects on the basis of knowledge resources of indigenous peoples, tend to support systems of control over indigenous communities. Political economy issues, rather than matters of indigenous peoples liberation, play a decisive role in determining modern character of Traditional indigenous Knowledge (TK).

Power relations of the global market, capital production on the base of TK resources, and the capital allocation, are the major forces behind the modern policies formation over TK. The relative character of the policy and the issues it attempts to address, makes the policy stay justified (and continuing) for as long as the ideology behind the practices stays unquestioned. Thus, the understanding of the TK as a concept, recognized by the international community, must involve understanding of the existing ideological influences which work to make TK a politically convenient concept. The difficulty in

changing the situation lays in questioning and criticizing the existing power relations by the very actors, involved into the system maintenance and policy creation.

 END

2.1 Regimes of Production of Knowledge in Life Sciences

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History and sociology of science and technology have shown that ways of knowing, ways of doing and ways of regulating are not universal but contingent and vary widely across periods, locations and disciplinary fields.

As far as the life sciences are concerned, we observe a series of general transformations, which have occurred since the mid 70's, and affect all dimensions of the life sciences, technology, and society relationship: in silico research and modeling have partly substituted for biological experimentations; high-throughput platforms complete or replace traditional labs; patented data tend to prevail over public information; public funding is increasingly linked to private initiatives; accountability and participation for users/patients have been integrated in regulatory discourses; etc.   Our assumption is that changes in the regulation of both the production and the uses of knowledge are pivotal in this reconfiguration: as the roles of National States have faded, regulation progressively shifts to market mechanisms, and to the interventions of civic society through social mobilizations and the increasing role of a scientific "third sector". The notion of "Regimes of production of knowledge" aims at taking seriously into account the broadness of the transformation by focusing on new forms of governmentality, power and agency without forgetting that biotechnology has a past.

This session will gather different scholars who have analysed of biomedicine, agriculture or food in various countries. The first objective is to provide a better understanding of the current changes (but also of international or inter-sectoral differences) in order to get a good appraisal of the main transformation and of their implications for the governance of science and technology. We also aim to discuss the relevance of the notion of "Regimes of production of knowledge" and the way it may impact –or not- on the research agenda of the STS.

Jane Calvert
ESRC Centre for Genomics in Society (Egenis)

The commodification of emergence: the integrative life sciences and their implications for ownership regimes

We are seeing transformations in the life sciences towards integrative, interdisciplinary work, particularly in the field of systems (or integrative) biology. This paper aims to understand better the implications of these developments for the organisation of

intellectual property and the governance of data.

Systems biology involves in silico research and modelling, and it draws on the skills of computer scientists and mathematicians. The centrality of modelling raises new issues with respect to intellectual property that the experimentally-based biological sciences have not previously had to confront. For example: what is a model? How do models fit into existing ownership regimes? Are models more suited to patenting, copyright or some form of Open Source? Modelling in systems biology also requires the standardisation and integration of vast amounts of data, raising a host of further questions about access to and appropriation of this data.

Systems biology studies emergent properties, and is often contrasted to reductionist molecular biology for this reason (although some argue that systems biology is reductionism writ large, while others see an uneasy co-existence between reductionism and complexity). How should we think about the commodification of emergence? Does emergence lend itself to commodification at all? Do existing intellectual property regimes rest on reductionistic understandings of the biology? How will the complexity and emergence we find in systems biology be framed in public discourse and policy debates?

Linda F. Hogle
University of Wisconsin-Madison

Intracellular Engineering and Extracellular Environments

Highly engineered systems are being embraced for the quantification, modeling and rational design of biology. The technologies emerging from this new way of doing life science represent quite different ways of knowing about both biology and engineering than traditional disciplinary approaches. The use of high throughput techniques such as microfluidics to direct embryo patterning or to recapitulate cell microenvironments is one example of the way material cultures and epistemologies are being transformed. Beyond the lab, however, are external environments involved in the regulation of life and life science, labor, and exchange systems. Production forms using self replication and sub- and inter-cellular niche development rather than scaled-up bioreactors call for different kinds of capital investments and infrastructures: the systems are small scale, likely not exportable to third party contractors, especially in less developed countries (as occurs in much of biotechnology and drug development) and require different forms of expertise. The myth of frictionless globalization processes may be confounded as changing ways of knowing and ways of production co-evolve.

Stephen Hilgartner
Department of Science & Technology Studies
Cornell University
High-Throughput Governance? Life Sciences as Platforms for the Rapid Production of Regimes

The high-throughput production of knowledge is a central feature of such fields as genomics, bioinformatics, proteomics, and systems biology. Accordingly, STS scholars have begun to analyze the new regimes of high-throughput knowledge production arising in these domains. This paper focuses on a different aspect of the contemporary life sciences: their capacity for the high-throughput production of regimes. Drawing on examples from genome research, the paper explores rapid regime production. The relevant regimes differ in scale, reach, machinery, and so forth, but the capacity to produce and modify regimes quickly is an important form of power. The conclusion reflects on the question of whether what one might call "high-throughput governance"—rooted in the capacity to generate new regimes quickly and continuously in a context of diversity and instability—deserves some space alongside more traditional concepts, such as regulation by states or markets.

Christophe Bonneuil
Centre Koyré d'Histoire des Sciences et des Techniques (CNRS, Paris France) and INRA/TSV

Post-fordist DNA : from gene action discourse to network metaphors in the new biology

Biology has in the last few decades, experienced a major shift in its dominant paradigms, epistemic cultures, metaphors, models of innovation and modes of regulation. In the age of the "central dogma" the gene, a discrete string of DNA coding for the mass production of a standard protein, occupied the position of the CEO in the taylorized shop-floor, a position of command and control of hierarchically organised factory-like processes within the cell. In recent year cellular functioning has growingly been reconceptualized as a distributed activity within complex adaptative networks, with no particular molecule and no particular level of organisation been viewed as the major source of causality.

The communication will explore this new discourse of biology with the tools of cultural STS studies as well as the recent sociology of worth of Luc Boltanski (Boltanski L & Thévenot L., 2006. On Justification. The Economies of Worth, Princeton, Princeton University Press; Boltanski L. & Chiapello E., The New Spirit of Capitalism, London-NY, Verso, 2006). A particular focus will be put on the strong homologies between the new network discourse in biology and the rise of the "connexionist world of worth" (Boltanski & Chiapello) in late capitalism.

Jean-Paul Gaudillière
INSERM/CERMES

A new way of regulating biotechnological innovation? About cancer risk, hormones, women, and the environment

Factors or circumstances increasing the risk of cancer have been at the forefront of biomedical research and public debates for decades. Observers often point out that the nature and hierarchy of these risks has radically changed. Genomics and DNA-based biotechnology has accordingly shifted the balance: hereditary factors, genetic predispositions, and embodied risks have become central, while external influences once associated with the environment or occupation have been superseded by individual choices and life styles issues. Recent controversies about the role of hormones in cancer however reveal a more complicated picture. These discussions take place in various arenas, from the university to the court; question the links between biological innovation and the socio-economics of industrial production; are associated with various forms of intervention and expertise by users and activists. In addition they focus on technologies, which are both medical and agricultural, combining environmental and embodied factors, i.e. the massive use of estrogens in preventive medicine and the release in the environment of chemicals with estrogenic properties. This configuration is therefore a good illustration of patterns associated with a new "regime of knowledge production" in the life sciences. This paper will discuss this novelty, and more precisely the idea of a new "consumer/activist" form of regulating biotechnological innovation on a historical basis. It will compare the contemporary discussions on endocrine perturbation with the 1970s Diethylstilbestrol crisis, which equally targeted hormones and cancer, red and green biotechnologies.

Pierre-Benoit Joly and Martin Rémondet
INRA/TSV

Republican cows, private chickens and distributed fish breeding: exploring mutualisation, farmers' participation, and the issue of diversity in animal breeding and the life sciences
In December 1966, the French Parliament voted a Law to organize research, collection of data, circulation of biological material, and use of animals and sperm on the French territory. Based on a detailed socio-historical analysis of the making of this Law, we wish to explore the diversity of models of innovation and the way it may be affected by current transformations of regimes of production of knowledge in life sciences.

For a number of key actors, this Law aimed at mobilising animal genetics in order to produce "the model cow" which would allow industrialising the dairy production. The paradox is that beyond the standardisation which may be associated with the Republican model of innovation of the 1966 Law, detailed analysis reveals that this period gave place to a wide diversity of configurations. On one hand, within the frame of the 1966 Law, the complex articulation between centralisation of data (and computation of index) and local collective action of farmers allowed maintaining diverse animal races and work on a variety of objectives. On the other hand, this Republican model is contrasted by others: the industrial/privatised model for chicken and a participatory model of fish breeding.

This variety of configurations is a perfect illustration of the diversity of links between ways of knowing, ways of doing and ways of regulating. We thus propose to characterise the variety of configurations of animal breeding schemes through several key dimensions:

- Mutualisation and rules of properties (from public status to private property rights through different forms of collective appropriation)

- Participation of farmers in the breeding programmes (from strict division of labour to distributed action)

- Metrological devices and their ability to combine robustness of indicators and their adaptability to a variety of situations

The key dimensions identified are instrumental to understand the stakes associated with the transformation of regime of product

 END

2.2 STS & Information Studies II: Archives & Databases

Organizers: Jean-François Blanchette
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Geoffrey Bowker, Santa Clara University <gbowker at scu dot edu>
Michael Khoo, National Digital Science Library <mjkhoo at ucar dot edu>
Chair: Michael Khoo, National Digital Science Library mjkhoo at ucar dot edu

This session explores the complex relationships that simultaneously bind and differentiate ontological traditions in natural and information science, traditions that have become central to data collection, use and re-use through computerization. As will be discussed by the speakers in this session, this complex relationship has both dystopian and utopian implications. On the one hand, the power to form the discourses that link and shape these various ontologies raises significant issues of politics and control. On the other hand, the mutually constitutive nature of the relationship suggests the possibility for multiple points for intervention. For instance, supporting the human-centered design of archives, re-scripting archival categories to reflect different forms of (philosophical) ontology, the archiving of digital materials so as to leave the history of the present open for future generations to interpret, or challenging the hegemonic potential of formal ontologies to close down civic space.

Normal Research Presentations
Peter Chow-White
Simon Fraser University

The Informationalization of Race: Databases, the Internet, and the Next Human Genome Project
The paper focuses on emerging questions about the relationship between race and communication technologies in the information age. As a mode of representation, a structuring device, and as a biological category, race is undergoing a significant transformation. Increasingly, racial knowledge is being constructed from seemingly neutral and unrelated pieces of information, which are collected, sorted, distributed, and analyzed through two key technologies: databases and the Internet. People are being sorted in old and new ways. I refer to this new articulation of race and technology as the informationalization of race. Differing from race as the body and race as culture, race as information is a product of informational dynamics where processes of creating, storing, and transmitting information become specific resources for production and power. While this process can be observed across social institutions, such as marketing and law enforcement, genetic engineering has emerged as a key technology in the informationalization of race. The next human genome project, the HapMap Project, provides a specific case where database technologies are integral to the process of knowledge construction and archiving. While genomics has promised advances in health,

it has also revived debates about the biopolitics of the human body and racial classification.

Steve Jackson
School of Information, University of Michigan

Crafting a history for water: modes of accumulation and commensuration

This paper surveys some of the peculiar archival challenges that attend academic work in the hydrological sciences – and its close cousin, practices of water management. As I shall argue, a good deal of academic research, and an even larger portion of management decisions, depends on fixing a history of water and tracing this trajectory into the future. The paper explores two binary modes or moments in this process: modes of accumulation and dispersion (by which waters are traced into, and out of, history); and modes of commensuration and distinction (by which waters are merged and sorted).

Martin Hand
Queen's University

Re-Membering The Past: Naming, databasing, and crawling Canada

Ways of knowing are also ways of doing. Drawing upon interviews and observation this paper examines initiatives within Library and Archives Canada that attempt to replace one 'way of knowing and doing' with another. This involves adjudications between long-standing cultural repertoires of knowing/doing performed through library and archive practices. It also involves adjudicating between different information technologies (print, photographic, digital, etc.) through which 'members' of the past circulate. Such initiatives require enormous amounts of rhetorical work in framing one way of knowing and doing as superior. By looking at current initiatives the paper explores the diverse registers of adjudication that are drawn upon in achieving this. The first case is Project Naming where archived photographic images of indigenous peoples are digitized and circulated to those communities to be re-named. The second case involves the databasing of collections in Library and Archives Canada. The new database seeks to neutralize differences between library and archive ways of knowing and doing. In both initiatives, pasts are 're-membered' with different knowledges, persons and things, made to appear more accurate in either an historicist or ethical sense. The paper comments upon integrative-materialist theories of practice in relation to these substantive explorations.

Ryan Shaw
School of Information, University of California, Berkeley

Archiving the Present

Thompson proposed that goods are divided into three classes: the transient, the durable, and rubbish. His "rubbish theory" is concerned with how goods move among these classes. It describes how certain items, formerly considered rubbish, are judged worthy of

being made durable. Thus attic clutter becomes archived collection. The processes by which these judgments are made are many and complex, but they have in the past focused mostly on items that have fallen into disuse and disrepair—rubbish.

Digital storage media have opened another possibility: making the transient durable. Ephemeral digital items can be built to last, indexed, cataloged, and searched. From research programs in the continuous archive and retrieval of personal experience, to trends toward "database journalism" and the centralized management of personal media collections, to the "archive everything" design of recent email software, the category of rubbish is being eliminated. Decisions about which documents are worthy of preservation and how they will be accessed in the future are now being made before any instances of those documents even exist.

Archives of the present promise to be exquisitely organized landfills, excluding nothing. But organizing structures inevitably make certain aspects of certain documents accessible at the expense of others. Archives of transient documents are particularly susceptible to excluding discourses which do not garner wide enough attention in the present. Insofar as our future studies of the past will be based on these archives of the present, there is a need to both better understand and actively participate in their design.

Ann Zimmerman
School of Information, University of Michigan

Mind the Gap: Taking Knowledge to Design and Back Again

Sociologists, historians, and other observers of the scientific landscape have noted that there is increased pressure on scientists to apply themselves to important human problems and that such demands have consequences for the organization, content, and communication of research. This paper argues that similar forces and analogous changes are at work in areas of social science. I examine this situation in the context of eScience, especially as it relates to advanced information technologies that facilitate access to distributed resources such as data, instruments, and people. Government funding for virtual scientific observatories, vast data archives, and big, multidisciplinary collaborations have provided anthropologists, information scientists, sociologists, and other scholars with access to rich sites of study. The price of entry is often tied to the ability to show how social science participation will increase the likelihood of success of these novel, risky, and large-scale scientific ventures. As a result, theoreticians of science find themselves engaged in the real-life task of building infrastructure, and social scientists with backgrounds in library science and human-computer interaction grapple with the limitations of existing frameworks to produce systems and technologies that scientists deem useful and usable. I use findings from research into the sharing and reuse of scientific data to illustrate the difficulty of translating information about social processes into the design of shared data archives. Conceptual foundations are needed to help connect the dots between knowledge of scientific practice and the development of policies, systems, or technologies that move science in new directions.

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Something from nothing: the interplay between clues and emptiness in different archives

Archives, be they public or private collections of written, visual and oral records, are dependent upon a decision making process that can vary from library to library, community to community and society to society. Using Arlette Farge's writings, among others, as a framework, we have formulated the following questions regarding the knowledge we acquire from archives: How is "reality" determined or reconstructed by what is archived? How does one fill the void left by that that was not archived? Why do certain societies choose to keep certain types of information and not others? How do our informational needs alter our reading of the archives and vice versa?

We have chosen to use two case studies to illustrate the importance of these questions. The first is an observation of the local decision making processes regarding what information is archived within a French company. Here, we are able to shed light on why certain records are chosen over others and extrapolate on what the long term implications of these decisions may be.

The second case study is an observation of the differences in documentation when undertaking a historical analysis of a technology in two countries. Here, we are confronted with societal norms that influence what is archived which inevitably filter what we can and cannot know. The resulting void forces us to reconstruct a specific history based on clues and not necessarily straightforward readings of archival holdings.

Bruno Bachimont (discussant)
Université technologique de Compiègne

END

2.3 New Perspectives on Science and Social Movements

Organizer/chair: Daniel Kleinman
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Over the past decade, Kelly Moore has become a prominent analyst of the relationship between science and social movements, integrating insights from political sociology and organizational analysis to provide us with a fresh angle of vision on this crucially important topic. In honor of the publication of her book, Disrupting Science: Political Protest and Institutional Change in American Sceince, 1955-1975, this sessions offers the work of a range of scholars who are doing cutting edge research at the intersection of science and social movements. Each presenter in some fashion relates his or her work to the research of Kelly Moore. Moore will serve as discussant for this panel.

David Hess
Rensselaer Polytechnic Institute

Rethinking Publics and the Lay/Expert Divide: Exploring Civil Society Science

Moore's work challenges us to think about the scientific field in relationship to social movements, and she explores the development of various responses by scientists. One example is the public interest scientist organization, such as the Union of Concerned Scientists, which was formed by scientists who in effect enter into civil society by forming a new organization. I will build on her work to develop a concept of "civil society science," or science that is produced by civil society organizations. Through a comparison of three examples based on long-term field research projects (environmental organizations, localist organizations, and complementary and alternative medicine organizations), I will chart out some of the possibilities and limitations of civil society science.

Abby J. Kinchy
Rensselaer Polytechnic Institute

Scientific Boundaries across the Border: A Consideration of Kelly Moore's Political Sociology of Science and Social Movements beyond the U.S. Context

Kelly Moore's research, from her study of the political engagement of American scientists to her analysis of the characteristics and outcomes of participatory science, provides remarkable insights into the relationships between science and social movements in the United States. Her writings explicitly recognize the specificity of the U.S. context, suggesting a need for cross-national comparisons and examination of

transnational processes. This paper builds on Moore's contributions through a case study of activist‑initiated participatory research in Mexico. Since 2001, when genetically engineered corn was found to be growing in remote Mexican fields, a transnational network of activists has protested the importation of GE corn from the United States and demanded the protection of native maize varieties. Among a variety of strategies pursued by this activist network, some peasant farmers and professional activists have undertaken scientific research, using a commercial laboratory, to discover the extent of transgenic "contamination" of native maize. This case suggests that participatory science may be facilitated in the global South by transnational activist networks. However, the outcomes of this effort have been mixed. On one hand, the findings of the activist‑initiated study have been disregarded by much of the scientific community and ignored by policymakers. On the other hand, the research effort was successful in terms of movement mobilization—the ability to recruit peasant farmers to the struggle and keep them motivated to act collectively at the grassroots level.

Brian Mayer and Christine Overdevest
University of Florida

Bucket Brigades and Community‑Based Environmental Monitoring

This paper examines the organizational effectiveness of "bucket brigades" or community‑based air monitoring networks as a solution to problems of asymmetric scientific information regarding local sources of toxic air pollution. Problems of asymmetric information and opportunism occur when polluting firms understand their industrial releases to a greater extent than affected communities, forcing community residents and organizations to rely on state or voluntarily‑reported data to understand their potential health risks. Building on the literature on popular epidemiology and participatory science, we examine how grassroots environmental organizations develop techniques for gathering and analyzing their own scientific evidence to contest industry‑generated air emissions reporting. In particular, we explore Kelly Moore's notion of activist‑based participatory science and the extent to which community actors are able to gain leverage over more powerful stakeholders by developing their own scientific data. Our findings suggest that community organizations that invest strategies and techniques to gather this type of performance‑based information are more likely to affect firm behavior than organizations that rely on other actors to report on air releases. Based on early findings and a review of secondary literature, we explore several mechanisms through which scientific data collected by community‑based organizations can influence industry and regulatory behavior.

Sabrina McCormick
Michigan State University

Democratizing Science: Movements in a Knowledge Society

This research develops a theoretical framework for understanding social movements that address science, technology and expert knowledge. 'Democratizing science movements' (DSMs) contest, reframe, and engage in the production of official scientific research in order to achieve their goals. They contest the seeming objectivity and neutrality of science and seek to legitimate lay perspectives. This new framework accounts for why such movements arise, how they function and what goals they aim to achieve. There is a vast range of movements around the world that fit into this framework, such as the anti-dam movement in Brazil, the environmental breast cancer and environmental justice movements in the United States, science shops in Europe, and the KSSP in India. In this sense, the DSM framework describes a broad, transnational phenomenon whose relevance spans multiple national contexts. Consistent with the work of Kelly Moore, this research also connects social movement theory, science and technology studies and political sociology to demonstrate how public distrust of and controversy over science and technology are mediated through social movement activity.

Kurt Reymers
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The Country and the Grassroots: A Rural Movement For Energy Independence

This is a working paper which presents an ethnographic study of a coalition of grassroots groups in central New York state that organized in the spring of 2006 to protest the construction of a 110 foot, 400,000 volt, 190-mile long direct current electrical supply line from Utica, NY to Rock Tavern, NY. The study involves how a newly conceived energy corporation, New York Regional Interconnect (NYRI), is capitalizing upon the U.S. 2005 Energy Act which claims that national energy emergencies exist in regions of the United States that are deemed congested by the Department of Energy. The coalition of citizen's organizations are jointly protesting the proposed power line on the basis that the federal government's assertions that their region is currently in an energy "emergency" is fallacious and contends that deregulation of the electrical industry is largely responsible for perceived market "congestion." They also see NYRI as a threat to the local environment along the proposed line, which includes a region of the Upper Delaware river designated and protected as a U.S. Wild and Scenic River in 1968. Additionally, the proposed power line would have a largely deleterious effect on the upstate New York economy, an economy that was likened to that of Appalachia by candidate-turned-governor Elliot Spitzer. The grassroots movement speaks to the sociological questions of rural activism and democratic practice, citizen's roles in scientific discourse and governmental policy-making, internet connectedness, and widely differing claims to knowledge and expertise of energy issues.

Kelly Moore
University of Cincinnati
Discussant

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2.4 Private Sector Science: Commercial Ways of Knowing

Organizer/chair: Rebecca Lave
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Samuel Randalls
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Because of its commercial genesis, private science is often deemed a less substantive way of knowing, with lower relevance, rigour and expertise than public science. Despite the fact that these sciences are practiced in different ways for different purposes, their boundaries have become increasingly blurred.   A number of STS scholars have examined the rise of private-sector science in biomedicine and agribusiness. The expansion of private sector science, however, extends far beyond biomedicine and agricultural biotechnology into the geophysical and ecological sciences. Private-sector science appears not only in the form of companies developing their own knowledge products, such as Exxon's internal climate change science, but also in the form of contract research and consultancy firms, creating markets for wetlands, carbon emissions, and other aspects of the environment that previously had been commodified only sparsely if at all.

Rather than assessing private-sector science and ways of knowing on a normative basis, this session examines them as historically-grounded practices with repercussions for a wide range of social actors and scientific communities. Papers compare the ways of knowing – practices of knowledge generation, consumption, and dissemination – that typify the private geophysical and ecological sciences with those in biomedicine and agricultural biotechnology. Issues explored include how the privatization of science differs by discipline; the role governments play in creating and regulating markets for private natures and sciences; and the ways in which the rise of private science calls into question common assumptions about what private and public sciences are (and how they are private and public).

Arthur Daemmrich
Harvard Business School

Innovation and Degradation

For nearly fifty years, polymers have been designed to resist nature's ravages. Innovation in plastics, for example those used to package food and beverages, is measured by reduced solubility, protection against breakdown by sunlight, and other features that extend product life. Starting in 1990, however, research into biodegradable polymers within universities and the chemical industry brought a new generation of products to market intentionally designed to break down in large-scale compost systems. This talk focuses on a case study of Ecoflex, one such product manufactured by BASF since 1998. In particular, I analyze knowledge and personnel flows among standard-setting on the national and international level for what counts as biodegradation, the firm's product invention and marketing process, and the implementation of composting as a waste treatment method in western Europe. Based on interviews at the firm, participation in a 'compost tour' and analysis of primary and secondary sources, the study reveals the extent to which commercial research and product development is intertwined with public standards. It also illustrates how chemical companies develop product strategies amidst conflicting expectations for its products from diverse constituencies.

Philip Mirowski
University of Notre Dame

MTAs and Research Tools as the Cutting Edge of the Commercialization of Science

Discussions of the commercialization of post-1980 science have tended to focus on patents and other salable encumbrances on the outputs of the research process, but have neglected what is arguable an even more important rise of Materials Transfer Agreements [MTAs] and other contractual restrictions upon the inputs to the research program. MTAs have grown from near zero to thousands of contracts signed per year at major research universities. A few economists (Wesley Cohen, Walsh, Marie Thursby) have suggested these have not presented any serious obstacles to research, but by their very character as proprietary, the data on these instruments is very thin. This paper explains the recent evolution of MTAs, and considers how one might begin to decide if they have been on net more a burden than a benefit to science. In particular, we stress how they are a necessary complement to a strategy of amassing intellectual property in the form of patents at research universities.

Kerry Holden
King's College London

What can the life of the scientist tell us about science and society?

The commercialisation of science has supposedly put great strain on the integrity of the scientific community to uphold objectivity and impartiality. The famous normative structure of science described by Merton in 1938 is apparently crumbling in the wake of entrepreneurial scientists with their hands shoved deep inside the back pockets of industrial giants, who see profits first and truth later. In biomedical science the boundary between basic and applied, public and private research has never been so tidy. To talk about biomedicine as being corrupted by commercial interests is misleading. Biomedicine is neither a linear or singular process of discovery; it takes shape across a spectrum of research specialities and environments that inevitably involve links between public and private organisations. This is reflected in government policy to improve relations between industry and academia, to create a sort of 'Mode 2' model for knowledge production. This paper questions where the scientist's agency is in these processes. Relying on the testimonies of biomedical scientists, working in institutional and commercial environments, this paper will explore the relationship between scientific identity and scientific knowledge to ask what the life of the scientist can tell us about science and society.

Rebecca Lave
UC Berkeley

Banking Streams: the commodification of restoration

This paper examines the impacts of market forces and scientific controversy on the emerging industry of stream mitigation banking, a practice that allows developers to destroy on-site riparian systems as long as they offset the impact through the purchase of restoration credits produced speculatively by for-profit companies. By legislating a pared-down equivalency between highly complex systems, stream mitigation banking represents the first significant commodification of riparian ecosystems and the advance of neo-liberal principles into the world of stream restoration. The controversy over how to establish equivalency between streams to be destroyed and those to be restored is heated, raising questions about the relationships between the needs of the market, the role of government regulation, and the development of the emerging science of stream restoration.

Samuel Randalls
Oxford University

Commercializing meteorology: weather, commerce and the emergence of weather derivatives

Meteorology has long been noted as having close connections and economic value to commercial interests. Since 1997 this value has been extended by the emergence of financial products, weather derivatives, to manage the costs of minor variations in the weather. The weather derivatives market has grown from being a small US energy product to become a $45 billion market today with a growing advertised ethos of doing something about or caring about the weather. Reconstructing the history of weather derivatives emphasizes the importance of meteorology, as well as circuits of finance, in stabilizing indexes, concepts and models for a functional weather market. This market has a number of implications for meteorology, including the re-valuing of data and forecasts, and the privatization of meteorological expertise. This is not a singular process as many traders have different expectations and aspirations. Based on interviews with many participants in the weather market, this paper engages questions about the commerce and politics of science, and the nature of public/private interest in science, examining issues surrounding data and forecasts predominantly within a UK context.

Arthur Mason
Arizona State University

Consultants & Components of Producibility in Liberalized Energy Markets

This paper identifies a few of the forms in which natural gas forecasters and the consulting firms they work for become partly responsible for new energy development on a local and global scale. Since energy market restructuring, consulting firms have had an organizational significance for the way government and industry leaders stabilize perspectives on energy markets. These firms combine technical prediction with new modes of communicative exchange and are important for the knowledge they generate but also for the forms of socialization and ritual-like learning environment they create. By producing a knowable and concrete future, consulting firms allow for the envisioning of disparate individuals as related through the simultaneity of time—a type of calendrical coincidence in the lives of industry and government—which provides a collective subjectivity on the energy future that is justificatory of ideals of progress, economic growth and increased energy consumption.

Discussant: Philip Mirowski
University of Notre Dame

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2.5 Ways Knowing Everything About Each Other: Critical Perspectives on Web 2.0 and Social Networking

Organizer/chair: Michael Zimmer, Yale Law School
Anders Albrechtslund, Aalborg University, alb at hum.aau.dk

Web 2.0, and its related online social networking sites, represents a blurring of the boundaries between Web users and producers, consumption and participation, authority and amateurism, play and work, data and the network, reality and virtuality. Furthermore, Web 2.0 and social networking facilitates new ways for personal information to flow between users, which means that this online trend represents new ways of knowing everything about each other.

Both Web 2.0 and social networking have been eagerly adopted with seemingly contradictory effects: on the one hand, Web 2.0 and social software have been associated with re-democratisation, empowerment and open content. On the other hand, they are seen as a huge possibility for profit, data mining, and market control from a corporate perspective. Needless to say, the hype surrounding these developments creates confusion with regards to definitions, which provides the perfect breeding ground for unintended consequences, misunderstandings, and even abuse.

In this session we offer critical perspectives on Web 2.0 and social networking, reveling how these tools empower new "ways of knowing" everything about each other, and mapping the challenges they represent. In addition to three paper presentations, a response will be provided by Søren Mørk Petersen of the IT University of Copenhagen.

Malene Charlotte Larsen
Aalborg University

Understanding Social Networking: On Young People's Construction and Co-construction of Identity Online

When non-users such as news media, parents, teachers or other adults talk about social networking sites they often do so from an outside perspective. That perspective tends to be predominantly critical and reinforce the prejudices or moral panics that are surrounding young people's use of new communication technologies. Many people fail to see the individual and social perspectives that young people's use of social networking sites have. This is due to an ignorance or lack of understanding what online social networking is really about.

My talk is based on my own attempt to really understand young people's use of social networking sites through a seven month virtual ethnographical investigation (Hine, 2000) carried out by me (Larsen, 2005). I take my point of departure in the most popular – but also most publicly criticized – social networking site in Denmark called Arto.

During the talk I will show how Danish youngsters between the age of 13 and 17 construct their identities through socio-cultural practices on www.arto.dk as part of their everyday life. Especially, I will address questions such as:

- Which mediational means do the users utilize to portray themselves and each other on Arto.dk?

- How do they understand 'friendship' on the social networking site and what kind of relationships are sought after?

- What role do friendships play in the youngsters' construction of identity?

- What does the site mean to them and how can it be seen as a continuation of their offline lives?

A concluding point is that the young people's construction of identity is heavily interwoven with their friendships. Their construction of identity often goes through their friends and in that sense there is both an element of self-construction as well as a strong element of co-construction when the youngsters construct their identity. This happens not only by using the site and its functionalities, but also by using each other as mediational means.

Michael Zimmer
Yale Law School

Surveillance 2.0: Peer-to-Peer Surveillance, Amateur Data Mining, and the (Unintended?) Consequences of Web 2.0

The rhetoric surrounding Web 2.0 presents certain cultural claims about media, identity, and technology. It suggests that everyone can and should use new information technology to organize and share information, to interact within communities, and to express oneself. It promises to empower creativity, to democratize media production, and to celebrate the individual while also relishing the power of collaboration and social networks.

But Web 2.0 also embodies a set of unintended consequences, including some that empower a growing panoptic gaze of "everyday surveillance" (Staples, 2000). Such externalities include the increased flow of personal information across networks, the rise in data mining to aggregate data across the network, the drive for intelligent agents that predict your needs, and the underlying philosophy of placing these tools in hands of all users.

In Technopoly, Neil Postman warned that we tend to be "surrounded by the wondrous effects of machines and are encouraged to ignore the ideas embedded in them. Which means we become blind to the ideological meaning of our technologies" (1992, p. 94). As the power and ubiquity of the Web 2.0 infrastructure increases, it becomes increasingly difficult for users to recognize or question its value and ethical implications, and easier to

take the design of such tools simply "at interface value" (Turkle, 1995, p. 103).

This talk will attempt to heed Postman and Turkle's warnings and remove the blinders to help expose the unintended consequences of Web 2.0. In this talk I will give a brief account of emerging Web 2.0 information infrastructures and the affordances they provide to engage in peer-to-peer surveillance and amateur data mining.

Anders Albrechtslund
Aalborg University

Placing Myself on the Map: Social Networking as Participatory Surveillance

An emergent trend in the context of social networking websites and services is geographical tagging. Geotagging is a way to add geographical information to media such as websites, RSS feeds and images in order to help users find a wide variety of location-specific information. Social networking sites and services such as del.icio.us, Flickr and Google Earth facilitate geotagging, which contributes to the building of a place-based folksonomy.

This brings a spatial dimension to the already extended information infrastructure of Web 2.0. Besides adding to the knowledge about the user's thoughts (blogging software), their likes (social bookmarking services), what music they are listening to (e.g. Last.fm), the practice of geotagging shares information about the whereabouts of the user and – in some cases – the people in the vicinity of the user. Furthermore, a number of specialized social networking sites and services have emerged – sometimes known as "mobile social software" – that specifically make use of geographical information. The main purpose of these is to facilitate social, romantic or business encounters by associating time and location data to social networks. Examples of this trend include Plazes.com (detecting location and connects the user to things nearby) and My MoSoSo (uses wi-fi peer-to-peer ad-hoc mode to facilitate networking with people within a two-minute walk).

In my talk I address questions relating to the ethical potentials of this kind of "participatory surveillance": What can we learn about surveillance through social networking and vice versa? What are the existential implications of the surveillance practices in social networking? What are the characteristics of the subjectivity taking part in geo-based social networking?

Ingrid Erickson
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Way of Knowing in Community, Online and On the Street

Today information technologies are often so embedded into our modern day lives that many of their features and affordances no longer generate attention or interest. However, analyzing certain technologies, namely social networking applications, within the frame

of knowledge can prompt new questions of self-representation, self-expression, symbolic cues, community boundaries, and privacy (Goffman 1959; Donath and boyd 2004; Smith et al. 2005). Computer-mediated social networks are quite popular online (e.g. websites such as MySpace and Facebook) and are increasing in usage on mobile devices as well (e.g. GPS-enabled mobile social applications such as Loopt and BuddyFinder). Both types of services link together "friends" through varying types of representative identifiers—some elaborate web-based profile pages that include bibliographic information, digital files, publicized network links, and group affiliations to others that are typically limited to username and locational coordinates. In both cases easing the process of making connections is key, but how this is accomplished—how we know what we need to know--varies if the domain is wholly or only temporarily virtual.

In this talk I intend to discuss at least five novel ways of knowing that are inherent in the engagements that online and mobile social networking technologies enable: 1) semiotic knowledge, 2) knowledge by presence, 3) knowledge by association, 4) knowledge by placement, and 5) knowledge of co-location. These findings are drawn from a larger ethnographic project on the social impacts of location-based technologies, specifically how technological practices evolve relative to conceptions of self and community.

Ben Light
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Gaydar on the Radar: Sexualities, Technologies and Cultures

The popular press reports that Internet dating has rapidly become one of the most profitable Web service, outstripping the former front runner – pornography (Sunday Times, 2006). This is not surprising as it is also argued that people now invest as much effort in their relationships developed online as those found offline (Carter, 2005). In this study we develop a theorization of an Internet dating site as a specific contemporary cultural artifact. The site, Gaydar.co.uk, is targeted at gay men and more specifically their sexuality. We suggest that contemporary received representations of sexuality figure heavily in the site's focus and the apparent ad hoc development trajectory of various commercial and non-commercial associated services. We argue that the ever growing set of services related to the website are heavily enmeshed within current social practices and are shaped by the interactions and preferences of a variety of groups involved in what is routinely seen as a singularly specific sexuality and cultural project.

Our deconstruction focuses upon the pervasive nature of the different interrelated functions of the site such as the overt representation of male escorts contrasted with the covert presence of Gaydar staff, extensions into the leisure industry in the form of gaydays.com, everpresent health promotion interventions and the contrasting identity constructions and market segmentations formed through cycles of commodification.

Through this study, we provide insights into significant contemporary phenomena including Internet dating, the study of sexuality and technology, and argue for the notion of sexualized technologies and cultural artifacts that embody sexuality.

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Where is the Goffman of the Internet?

Studying On-line Interaction and Ways of Knowing
What exactly is the difference between on-line interaction and interaction in the ordinary social world? How much of interactional sociology developed by figures such as Goffman works for on-line worlds? In this paper I will compare on-line interaction with interaction carried out under conditions of what Goffman calls "co-presence". I will draw on my earlier studies of market traders and compare it with a study of a digital music site, ACIDplanet.com.I will show how features of face-to-face interaction, such as incrementality and establishing reciprocity, work in on-line communities.

Søren Mørk Petersen
IT University of Copenhagen

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2.6 Technologies of Repair

Organizer/chair: Lindsay Smith
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Jason Cross, Duke University, Jason.Cross at law.duke dot edu

In the last twenty years, there has been an ever-increasing process of standardization in post-conflict reconstruction efforts. Large-scale projects, for example the international response in the former Yugoslavia, serve as exemplars of a normative intervention. Scholars in post-conflict areas have come to recognize the usual suspects of the international aid community brought in as consultants to offer their expertise on how best to rebuild and repair—from identifying the dead to promoting democracy. There emerges an international toolkit of reconstruction and repair, armed with a standard package of scientific, political, and legal technologies. These technologies have particular histories but are remarkable in the degree to which they travel. Studies of social repair, reconstruction, and reconciliation in post-conflict societies have focused largely on transformative processes—the presumed fashioning of order (imagined or fragmentary) through juridical, political, and economic interventions. Less attention, however, has been paid to the mechanisms themselves. On this panel we focus on these "technologies of repair" to explore how certain tools of the international reconstruction toolkit have come into being and how they circulate across different sites of post-conflict intervention. Through case studies of technologies of repair ranging from DNA identification and forensic anthropology to election technologies and democracy building, the papers on this panel document the co-production of knowledge and post-conflict order through local, situated examples of what are often imagined to be unchanging technologies.

Lindsay Smith
Anthropology, Harvard University

"Science in the Service of Human Rights": Forensic DNA and transitional justice in post-dictatorship Argentina

In the wake of the widespread terror of the 1976-1983 dictatorship, women activists in Argentina had the dubious honor of being the first group worldwide to organize around genetic identification technologies as tools for creating knowledge in the face of disappearance. In the twenty-five years since Argentine activists first connected science and human rights, forensic DNA has gained increasing preeminence in advocacy work worldwide, becoming a standard "technology of repair" in post-conflict and post-disaster situations. In striking contrast to the growing consensus worldwide on the applicability and importance of these technologies, Argentina continues to struggle with its past, and the role of genetic technologies of identification within this process of transitional justice remains contentious. In this paper, I will trace the complex history surrounding forensic DNA technologies and human rights in Argentina through an examination of its two

different uses: identifying the kidnapped children of the disappeared, who were raised by military families; and identifying the bodies of the disappeared themselves, buried in clandestine gravesites. Through a pointed comparison of these two similar and yet historically quite distinct socio-scientific movements, I will explore the coproduction of political order and forensic DNA as a technology of repair.

Jason Cross
Anthropology & Law, Duke University

Instrumentation and Expertise in the Anthropology of Governance

This paper examines the relevance of social studies of technical expertise for the anthropological study of governance paradigms and practice. In particular, I focus attention on the reframing of problems in theory and method that are likely to result from a sustained engagement in both areas of study. Drawing from primary ethnographic examples in the areas of democratic governance programming and intellectual property and trade policy, as well as recent studies of "technologies of repair," I propose several features common to cultures of instrumentation and expertise that deserve further sustained ethnographic study. I also suggest that the requisite attention to both the technical and affective dimensions of such technologies of repair can lead to important contributions for science and technology studies and anthropology more generally.

Sarah Wagner
Anthropology, Harvard University

Piecing Them Back Together: International Interventionism and Identification of Bosnia's Missing Persons

In Bosnia-Herzegovina, Western governments have lent significant financial and political support to the project of identifying the mortal remains of missing persons, specifically victims of the Srebrenica genocide. Promoting the development of an innovative DNA-based forensic technology, these sponsors extol the merits of identification within the framework of transitional justice. A focus on the broader social uptake, however, of this genetic science reveals its potential for both reconstituting social individuals and deepening communal divisions.

Kimberly Coles
Cultural Anthropology, University of Redlands

Electoral Forms and Knowledge

This paper considers the narrowing of ways of knowing in the realm of post-conflict elections and international democratization activities. The instrumental technologies of repair at work in Bosnia-Herzegovina produced and assisted in the codification of a

particular aesthetic of free and fair elections. Two specific interventions within the

electoral reconstruction toolkit -- tendered ballots and C3 forms -- are examined as constitutive of a globalizing democratic knowledge despite wide variety in the practice and deployment of the materials across space and time.

Carlota McAlister
York University

Playing Dead: The Mimetic Production of Human Rights Facts in Guatemalan Forensic Anthropology

Around the world, what was formerly considered political violence is increasingly treated as a problem to be addressed through human rights fact finding procedures. Forensic anthropology, which makes its factual claims in the physical language of bones, produces particularly compelling human rights facts. But how do the bones come to speak so convincingly? Looking at human rights forensic anthropological practice in Guatemala, I will show how forensic anthropologists establish their authority as ventriloquists of the violent past by mimetically identifying themselves with the bones they claim to read, and explore the consequences of their ventriloquism for the broader context of human rights work, including the practice of forensic anthropology itself, in contemporary Guatemala.

Discussants: Peter Redfield
University of North Carolina, Chapel Hill

Sheila Jasanoff
Harvard

Rosemary Coombe
York University

END

2.7 Postphenomenological Research I
Don Ihde
Stony Brook University
dihde at notes.cc.sunysb dot edu
Catherine Hasse, Denmark University of Education
caha at dpu.dk

What has become known as a 'postphenomenological' style of research has begun to produce 'empirical turn' concrete case studies of a range of science-technology phenomena. The panel will open with a brief description of postphenomenology [Don Ihde] and consist of a series of case studies divided roughly into two groups: The first studies are socially dimensioned studies which will include the technology transfer of mobile phones to Bangladeshi women [Evan Selinger]; an inquiry into the separation of knowledges and spatial separation of immigrant and traditional styles of knowing[Azucena Cruz];

Globalization and biotechnology as technology transfer [Taylor Hammer]; Trust in Science [Robert Crease]. The second section will entail visualization phenomena as modes of knowledge and will include: Multistable perception in scientific renderings [Catherine Hasse]; Constructing Thaumaston (astonishing quasi-objects) with Bose-Einstein condensates [Adam Rosenfeld]; ways of knowing the soul via fMRI imaging [Arthur Piper]; a postphenomenology of ultrasound in fetal imaging [Peter-Paul Verbeek]; first person reports and the alien hand experiment [Frances Bottenberg];Resolving multistable image issues and the Mars Explorer [Robert Rosenberger].

Don Ihde
Stony Brook University

Postphenemenological Research

Coming with a background in philosophy of technology, a research style now often called 'postphenomenology' has led to a series of 'empriical turn' or concrete case studies related to a wide range of science and technology contemporary phenomena. This introductory presentation will show how postphenomenology combines elements of pragmatism which helps reduce the excessive emphasis upon 'consciousness' from classical phenomenology, through the rigorous application of variational theory which holds to a relationalistic ontology similar to other contemporary ontologies [Latour and Haraway, for example] by forefronting knowledge as situated, embodied and multistable.

Evan Selinger
Rochester Institute of Technology

Postphenomenology and the Village Phone Program

Retaining a commitmenet to the flesh-and-blood agency responding to practical
challenges, postphenomenology emphasizes embodied praxis, technological mediation,
and the ambiguity of experience. In the case of technology transfer of mobile phones to
Bangladeshi women through the Grammeen Bank program, I will attend to the gender
specific effects of techno-economic globalization in this case. I will contrast certain of
the economic utopian claims with an alternative account which includes the lived
dimensions of practice which remain invisible in much economic analysis and focus upon
a partial picture of how the introduction of mobile telecommunication is transforming
Bangladesh's cultural ecology.

Azucena Cruz
University of Paris

Locating Oneself in the Complex Map of Knowledges

Some European cities have experieced an influx of immigration, providing new
challenges to traditional ways of social being. Along with these immigrants hve come
ways of knowing that are perceived as incompatible with those of their host country. One
interesting result of the mixing of knowledges has been the eriecton of a false dichotomy
of "traditional" and "other." The "other" category may itself also include a plentitude of
different knowledges which are also incompatible with each other. Yet, for the sake of
preserving the dichotomit structure, such modes of kowing must be represented by a
caricature basupon superficial knowledge. This divide separating traditional and other,
preserves the caricature by preventing any real discourse from occuring. Exacerbating
the problem of seemingly irreconcilable knolwedges is the fact that the immigrant
population is also separated spatially from the rest of society into ethnic enclaves (or
ghettoes) that afford little if any contact with the population they are expected to emulate
and whose knowledges they are expected to adopt.

Taylor Hammer
Stony Brook University

Agricultural Biotechnology and Globalization

The first half of the 20th century was marked by an expanding implementation of modern
agricultural techniques on a global scale. The "Green Revolution" included a concerted
effort on the part of nongovernmental organizations to bring modern agriculture (modern
grain varieties and chemical fertilizers) to developing areas. Though tehse projects often
did increase food production, there were often overshadowing environmental and social
problems caused by the imposition of these new technologies. In spite of this some

writers continue to use the Green Revolution as a model for the now further implementation of agricultural bioltechnologies. Using the Green Revolution as a historical model, this paper explores the relevance of a philosophy of technological artifacts as discussed by Don Ihde and Peter Paul Verbeek for the case of agricultural technology transfer. This apaproach allows one to question and critcally assess currently developing agricutural technolgoies while avoiding positions of nostalgia or unreflective enthusiasm. The goal is to learn the lessons of the Green Revolution for contemporary problems.

Robert Crease
Stony Brook University

Trust in Science

Virtually all human activities depend upon trust, without which such activities would grind to a halt like machines without oil. Science is particularly dependent upon trust in two ways: Scientists must trust specific things like data, theory, equipment, colleagues, mentors, peer reviewers and institutions. And, scientists must also share a trust that causal explanations exist for questions they have not yet answered, such as how particles get mass, how evolutionary mechanisms evolve, etc. Practitioners can revise and withdraw the first kind of trust in specific things and yet remain scientists. But the same does not apply to the second kind of trust. Scientists tend to approach trust in a particular way, focusing on the trustworthy object rather than the trusting subject. They tend to assume that an impersonal, detached, and fully competent trusting subject --the scientist-- is faced with a decision on what to trust. I will here address this twofold role of trust in science in such a way as to allow a recasting of familiar issues in the philosophy of science such as discovery, the repudiation of mavericks and the intolerance of pseudoscience. I will illustrate by turning to limited examples of historical case studies (Keplers Laws, Planck's modification of Wien's law, etc.).

Catherine Hasse
Denmark University of Education

Multistable Perceptions of Scientific Renderings

Graphs, models, illustrations, diagrams serve basic epistemological ways of knowing in science, often making sight the most privileged of the senses. Vision has seemingly allowed and objective perception at a convenient distance to one's body. This paper challenges this view. Part of the argument is based upon extensive anthropological field work through my enrollment as a physics student at the Institute for Physics in Denmark a decade ago. I examined the process of culturalization in physics culture which could be defined as a process of the homogenization of embodied microperceptions--a concept found in the postphenomenological philosophy of Don Ihde. Microperception belongs to what he calls 'Body I' the corps vecu of bodily-sensory dimensions, but which exists only in a cultural context. Bodily perception thus has cultural structure--macroperception--

which leads to a polymorphy of perception. Perception may be multistable. Body II i the carrier of these cultural-historical dimensions but is inseparable from the sensory-bodily Body I. I shall argue that the diversity in scientist's perceptions of scientific visual images can be explained by such a postphenomenological approach. Physicists handling the physical objects visualized in images and models perceive aspects of images which are invisible to other physicists and lay people without this corporeal experience. Perception becomes multistable when mataerial constraints meet the learning human bodies of the physicist whose scientific interpretation of such renderings are not reducible to representation or subjective experience. In the culture of physicists there are no subjects detached from objects, but transformations of human bodies with transformations of mattering matter. Embodied cultural learning processes expose the structure of sciences and technologies to be multistable with respect to uses, cultural embeddings and p

Adam Rosenfeld
Stony Brook University

Bose-Einstein Condensates as Thaumaston

The 'emprical turn' in science studies emphasizes the role of materiality and the agency of non-human objects which, in the case of Bose-Einstein condensates produces an enigmatic thaumaston or astonishing quasi-object. I address this issue by examining Bose-Einstein condensates which re super-cold phenomena in atomic physics in which certain types of atoms, when cooled to nonokelvin temperatures loose all distinguishing properties and collapse into a single "super atom." In this state a collection on the ordre of 10 to the 5th atoms exhibit identical wave functions as well as identical location in space-time. I argue that the fact that the atoms in such condensates are in principal indiscernible (and therefore identical) creates an aporia regarding the fundamental onology of the object(s) of our inquiry. Is it one object or 10 to the 5th objects? This conflict between the distinct identity of objects over time with the lack of distinct identity of such objeccts with they are indiscernible from each other poses a challenge to the theoretical background of the investigating subject. This peculiar object takes on the nature of a thaumaston or 'astonishing' quasi-object. This account of material aagency as encountered via a situated perspective can be generalized to any instance of a paradigm shifting scientific event and to the role of technological complexes in the laboratory (laser cooling and evaporative devices which are necessary to create the nanokelvin enviorment)in order to create the thaumaston. In this way we see the special case of material agency ushers in a special role for technology in the laboratory under the specific theoretical attitude in science, which differs from the role outside the laboratory for ordinary production.

Arthur Piper
University of Nottingham UK

Ways of Knowing the Soul with fMRI

Functional Magnetic Resonance Imaging (fMRI) has become a major way of knowing for doctors and patients, and more recently, for scientists and theorists working ont he study of aesthetics, consciousness, ethics and other areas traditionally associated with research in the humanities. This paper examines how technologies and conceptual frameworks about the mind co-ordinate in fMRI to construct a "physics of the soul," as Jean-Pierre Changeux has described it. A careful analysis of the processes involved in fMRI conducted in the tradition of empirical phenomenology, however, show that the material technologies serve to push the conceptualization of mind in a particular direction--one characterized by an idealisation of bodily interiors and a modularisation of cognitive functions. In other words, the knowledge gained by the process of applying fMRI technology to the study of consciousness comes at the expense of other possible conceptualizations of mind and body. This in turn leads to empirical and theoretical questioning about possible application of fMRI to a "physics of the soul."

 END

2.8 Global Knowledges and Democratic Agency

Organizer/chair: Daniel Barben
Arizona State University
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Clark Miller
Arizona State University
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We would like to relate the 4S theme of "ways of knowing" to global arenas and democratic agency. By "global knowledge" we mean knowledge concerning global affairs (e.g., life on planet earth, global policies) as well as knowledge that is circulating globally. This notion of global knowledge opens up questions about global and local as well as universal and particular aspects of global knowledge. The process of globalization brings about a significant increase not only in globally circulating knowledge but also in knowledge about global affairs. Problems relating to the long-term survival of humanity have accumulated a growing number of serious pressures, creating challenges to both the ways of knowing and doing things at global, national, and local scales. Ways of knowing are inseparable from ways of doing in a particular social order. This raises questions about the knowledge base of practices and decisions and about the distribution and forms of power, legitimacy, and accountability. Recent transformations in the world order have created new domains of knowledge, decision-making, and power which deserve further critical examination, so as to increase our knowledge about those domains as well as (currently often lacking) institutional legitimacy and democratic agency.

Daniel Barben & Clark Miller
Arizona State University

Global Knowledges and Democratic Agency: A Research Agenda

In this talk, we will outline the objectives of a major new research initiative on Global and Comparative Knowledges, together with findings to date. With this initiative (in which this panel builds a step in creating an international network of scholars) we would like to contribute to a better understanding of the above themes and ultimately, through increasingly interrelated and comparative perspectives, to a significant new body of research in science and technology studies.

Alastair Iles
University of California, Berkeley

Measuring Chemicals in Human Bodies: Knowing Locally and Globally Through Biomonitoring

In the past five years, biomonitoring activities (or the scientific measurement of chemicals in human bodies) have developed rapidly. Instead of measuring exposures to chemicals in the ambient environment, researchers can identify exposures within bodies. They can potentially link these exposures to health effects. Biomonitoring can provide direct evidence of chemicals entering bodies. A variety of government and non-government biomonitoring activities are appearing in North America and Europe. Following the US Centers for Disease Control's national program and California's decision to build a statewide system, the European Union recently announced plans to create its own scheme. Canada has also instigated a biomonitoring program. Asian and Latin American nations have not yet participated in biomonitoring program-building. New knowledge about bodies is beginning to circulate globally but reflects the choices of policy-makers and scientists in each region or country.

In addition, numerous NGO-sponsored biomonitoring studies are occurring with the aim of pressing for regulatory changes and putting pressure on industry to be accountable for toxics. These studies contribute to the growing, apparently global circulation of biomonitoring but reflect localized political concerns. Many NGOs are beginning to use the concept of "body burden" to demand further regulation of toxics. They criticize institutionalized biomonitoring programs as lacking participation and accountability. Much controversy exists over whether "body burden" may sensationalize toxic risks. Yet body burden may come to define both a more globalized, and a more localized, knowledge about chemical risks. For example, activists at the international POP treaty negotiations are increasingly viewing themselves as sharing polluted bodies and thus a neighborhood of sorts across the world.

In this paper, I examine the intersections of biomonitoring with processes of global/local knowledge production and circulat

Kyriaki Papageorgiou
University of California, Irvine

Genetics, Goethean Science and the WTO's Fact Finding Quest: a View from Egypt

The debates over the biosafety of genetically modified organisms (GMOs) raise a series of questions both about the notion of global knowledge and democratic agency. On the one hand, the disputes over agricultural biotechnology are embroiled in locally specific socioeconomic interests and culturally situated knowledge practices. On the other hand, they are articulated within claims about the universality of science and anxieties about the future of global food supply. Is the establishment of a global knowledge framework

regulating GMOs feasible? In the absence of internationally accepted biosafety standards, who gets to decide about the commercialization of agricultural biotechnology and for whom? This paper tackles these quandaries by focusing on Egypt's delicate position vis-à-vis the recent case on GMOs at the World Trade Organization. This case was filed by United States against the European Commission on the grounds that the latter's memorandum on GMOs had no scientific basis. Egypt was originally a US partner in this lawsuit along with Canada and Argentina, but it withdrew its support in a letter by the Egyptian Ambassador to the Director of the European Consumers Association. Soon after this letter was made public, the Egyptian Minister of Foreign Affairs received a letter from a US senator stating that Egypt's withdrawal from the WTO lawsuit jeopardized his support of Egypt's free trade negotiations with the United States. As the WTO was embarking on its "fact-finding quest," perhaps the most tedious and controversial in the history of this organization, the Catargena Protocol on Biosafety was put into force. Being a signatory of this international agreement, Egypt became obliged to use it as the primary text for assessing bio-safety.

My paper discusses Egypt's entanglement in these international deliberations over agricultural biotechnology in an attempt to open up a discussion about the growing power discrepancies in the establishment of international kno

Laureen Elgert
London School of Economics

Global Discourse and Local Recourse: Closing Doors and Opening Windows? Does Global Environmental Knowledge Help the Poor Secure a Voice in Resource Management Deliberations?

The globalization of environmental knowledge has given rise to the emergence of environ-mental orthodoxies. Many of these orthodoxies are centered around accepted truths that regard the relationships between human motivations and behavior, and ecological outcomes. This paper explores how global environmental knowledge has been used to both limit and expand opportunities for making legitimate claims to rights and resources, and thus, has impacted on the potential for enhanced democratic deliberation in governance institutions. It focuses on the campesino farmers living in the watershed around the Mbaracayu Forest Reserve in Paraguay, where UNESCO's recognition of the area as a MAB world heritage site in 2000, has given campesino actions a prominent position within the international environmental conservation community.

Drawing on the strong theoretical foundations layed by Fairclough, who likens discourse to social action (Fairclough 1992), and Jasanoff, a pioneer in the idea that knowledge and social order are co-produced (Jasanoff 2004), I show how global environmental knowledge is used fiercely as a political tool in the Mbaracayu to both maintain and redress power relations. I begin by describing aspects of NGO (non-governmental organization) interventions in the area, that serve as mechanisms for the deployment of global knowledge. These include orthodox truths about land claims, sustainable and unsustainable cultivation techniques, deforestation and biodiversity and commercial vs.

subsistence farming. Then, I examine how: local people have both used this knowledge to frame their concerns about their own marginalization on the one hand; and how this knowledge has been used by powerful local, national and international actors to eclipse and illegitimate these concerns on the other hand.

Much of this case study focuses on the fact that a large part of the Mbaracayu region, colonized by small Paraguayan subsistence farmers over the past 25 years, has

Shobita Parthasarathy
University of Michigan

A Contested Boundary Organization: Understanding the Role of the Patent Office in Global Context

This paper focuses on recent contestations over the role of the patent office as a boundary organization. A variety of civil society groups and scholars have begun to challenge the patent office's role as a boundary organization that sits at the interface between science, government, and industry. The decisions that patent offices make, they argue, have serious global ethical and social implications that must be taken into account—they encourage the commercial exploitation of technologies that diminish the importance of indigenous knowledge, make essential health care unaffordable for citizens in the developing world, violate the sanctity of human and animal life, harm the environment, and devastate free scientific inquiry. The patent is no longer a quiet and closed technical domain; it has become a forum for battles over some of the most pressing global public policy issues of the day. Defenders of the status quo, meanwhile, argue that the patent office is not an appropriate venue for such questions. It is a space where inventors are given a right to exclude others from manufacturing an invention, and has no control over whether or how an invention is actually used. In these debates, the global role and reach of the patent office is also being negotiated. Whose knowledge—scientific or indigenous, oral or written—counts as "prior art" for the invalidation of a patent application? Do patent offices have a responsibility to citizens and economies outside of their legal jurisdiction? What are they? In this paper, using US and European debates over patenting biotechnology as case studies, I explore how the groups involved in these debates envision and contest the roles of patent offices in the global context.

END

2.9 Mobilized Subjects: Militarization in National and Transnational Contexts

Organizer/chair:
Caren Kaplan
University of California, Davis
cjkaplan at ucdavis dot edu

This panel investigates the ways of knowing in civilian and commercial life that can be understood to be militarized. Some questions these papers will address include how to analyze critically the globalized "military-industrial-entertainment complex," how modes of militarized knowledge are produced through medical science or consumption, how the mobilization of subjects of security occurs in the current era of transnational economic and cultural flows, and the ways in which militarized entities "get to know" each other across territorial borders. The goal of the panel is explore diverse examples and to produce new questions and guidelines for future research.

Caren Kaplan
University of California, Davis

What Counts as Militarization? Mobilized Subjects in a Long War

The state of war appears to require a binary determination of two sides to any conflict; us and them. Yet this Hegelian model is insufficient to understand the complexities of subjectivity in times of war. When the war is a "long" one, as the current conflicts appear to be, and the combatants are not all members of standing, national armies but, rather, non-governmental, then the rubrics of other times and places may no longer apply. The cultural effects of contemporary globalization need to be considered in this context, in a time when video games simulate combat in inner city war zones expanded to fantasy locales and when combat simulates videogames in war zones expanded to house to house searches. Given the effects of diasporas and immigrations on a global scale, with economic restructuring and recession, questions of identity emerge in new ways. This paper will introduce the primary questions that animate the research presented on this panel, asking what counts as militarization after the invasion of Iraq and Afghanistan, after the attacks of 9-11, and after the destabilization and reaffirmation of nationalisms that these events have spurred?

Minoo Moallem
University of California, Berkeley

Objects of Knowledge, Subjects of Consumption

Commercial and consumerist claims to power are not separated from armies, politicians or militarism. Both empire and nation operate at the intersection of culture and economy by producing and reproducing forms of knowledge that are deeply invested in the other's

otherness. In this paper, I analyze the ways in which consumerism converges with militarism in creating pedagogic and affective relations to material objects that are targeted to exhibit total mastery of the other's culture. Through an examination of the connoisseur books on the Persian carpet, I interrogate the ways in which imperial pedagogical narratives on certain material objects provided space for both the propagation of imperial networks as well as further development of masculinist-nationalist identities and belongings.

Inderpal Grewal
University of California, Irvine

Feminist Theorizations of Security

This paper will examine feminist theorizations of security. A great deal of the current feminist work on the relation between gender and security lies within the field of international relations. Outside of international relations or political science, recent non-feminist approaches have turned to critical theory, predominantly Foucault, for theorizing security. I will examine these two areas of
scholarship to ask how security can be used within transnational and postcolonial studies to understand the relation between empire, media, and security, and the ways in which Foucaultian approaches can be both useful and limiting.

Kristen Ghodsee
Bowdoin College

News Friends from Former Foes: The Geostrategic Tango of America's Military Presence in Bulgaria

In recent years, the American military has quietly begun to decommission its bases in Germany and started a quiet migration of military personal and equipment to the countries of the Eastern Europe. This paper will focus on the small Balkan country of Bulgaria, the most geostrategically desirable because of its proximity to the Middle East, and how the local media in affiliation with political elites have tried desperately to characterize American military presenceas a boon to the country despite popular outrage against the arrangement. Similary, I will examine the representation of Bulgaria in the American media and the fierce resistance that the move from Germany has met within the ranks of the armed forces. I am interested in how the growing presence of the American military requires a reimagination of "Americans" and "Bulgarians" and how new military alliances artifically create new NATO "friends" out of former Warsaw pact enemies.

Jennifer Terry
University of California, Irvine

Traumatic Brain Injury: An Instance of the Mutual Provocations of Medical Science and Militarism

Drawing on the elegiac consideration of "woundscapes" by audio artist Gregory Whitehead and the claims of Michel Foucault regarding the power over life and the acts of "letting die" practiced by biopower regimes, this paper will examine what is being called "the signature wound of asymmetric warfare": traumatic brain injury. TBI is symptomatized in loss of memory, linguistic deficiency, and social dissociation. It occurs as a result of blast injuries caused by improvised explosive devices used to disrupt or counter occupying uniformed forces. I analyze the naming and treatment of the injury as a "signature" wound marking a particular history of technology, geopolitics, and biopolitics to show the ways in which medical techniques and violent warfare function in a contrapuntal relationship, provoking one another in a manner that indicates the close ties between hygienic and military logics.

Sarah S. Lochlan Jain
Stanford University

Video Death / Urban Death

In this paper I will analyze the militarization of urban space, as rendered through automobility.   I will examine the literature on war and automobiles, developing a theory of commodity violence. I will then analyze Grand Theft Auto, the computer game, focusing specifically on the relays among American urban space, GTA urban space, and the projectile economies of automobiles.

Chandra Mukerji (discussant)
University of California, San Diego

END

2.10 Ways of Knowing the Field

Organizer/chair: Christopher J. Ries, cjries at ruc.dk, Roskilde University, Denmark

Since the 19th century, standards of credibility, objectivity and accountability have been defined according to ideals manifested in the limited, generalized and carefully composed framework of the scientific laboratory. Fieldwork, on the other hand, is by definition conducted in intimate, unpredictable and unorganized interaction with particular places and with local actors that influence, shape and to some degree may even constitute results. Yet, while this may have earned knowledge produced in the field a reputation for being further removed from the scientific ideal set up by the laboratory standards, field work remains a crucial tool for making the world available for various kinds of (scientific) investigation.

This session explores ways of knowing the field, including ways of knowing about the production of knowledge in the field. The papers examine various kinds of field work such as expeditions, polar field stations and field work, surveys, observation networks, etc. Moreover, field work is situated in relation to politics, economic activity, scientific standards, the public, and the media. The session aims at opening up a broad discussion of the field sciences and the different ways of knowing attached to them.

Christopher J. Ries
Roskilde University, Denmark

Cartography, authority and credibility: Field stations and field knowledge in early twentieth-century Arctic research

In the mid-1930's, Danish geologist and Arctic explorer Lauge Koch established a network of field stations and traveling huts in Central East Greenland. The establishment of a permanent infrastructure in the field caused a revolution in the whole culture and organization of Danish Arctic exploration. Within this context, this paper examines a debate on scientific validity and authorship in topographic and geological cartography that occurred at a meeting in the Danish Geological Society on 9 December 1935. The meeting was called by eleven of the most prominent geologists in Denmark, accusing Lauge Koch of cartographic fraud and theft of scientific results. A detailed analysis of the various points in the discussion makes possible the identification of different technological and social foundations for authority claims of different cartographic modes in Danish Arctic research in the early 20th century. At the same time, the inconsistency with which both parties carried their arguments reveals uncertainties about how to assess the definition and validity of observation, compilation and speculation in cartography, as field stations, new technologies and social and structural change challenged traditional academic power structures within the Danish Arctic scientific community.

Sverker Sörlin

Royal Institute of Technology, Sweden

Credibility on ice: Forming fragile climate knowledge in fugitive fields

In this paper I will use glaciology and climate science in the Polar Regions as a prime exemplar in order to arrive at a more general understanding of the production of knowledge in the field. Glaciology's concern with truth and trust can be seen in a wider historical and sociological context. In the "history of truth" (Shapin 1994) the geological sciences occupy a special position. In the course of the 19th century we can see the gradual differentiation of geophysical research, which evolved with distinctly different relationships to credibility. The case of climate change served as an early (from the 1930's) and important test case, and a forceful driver, for the development of a modernized field science of glaciology and meteorology in the Polar Regions. Research practices of precision in glaciological field work are used to enhance trust: field notes, observation techniques, instruments, storage and transportation technologies, etcetera, neither of which have been too carefully studied before. Research stations in the field are of many sizes and shapes, sometimes of a makeshift character that we might preferably call "installations" (with a conscious connotation to the art concept). In essence, the research station could be interpreted as an institutional attempt to resolve the tension between the laboratory and the field, and the field as a border zone of insecurity to be permeated with the orderly, encultured epistemology of the controlled experiment.

Suzanne Zeller
Wilfrid Laurier University, Canada

Conflicted Ways of Knowing: Art, Science, and the "Realistic" Animal Stories of Ernest Thompson Seton (1860-1946)

This research offers a historical case study in the transition and transmission of scientific ideas and sensibilities. During the late 19th- and early 20th c., the world-famous artist-naturalist Ernest Thompson Seton's "realistic" animal stories and paintings conveyed to generations of devoted readers his post-Darwinian understanding of nature's survival ethic. Seton imbibed this view while growing up in Toronto, Canada under the mentorship of Dr. William Brodie (1831-1909), a remarkable local naturalist and entomological authority of international stature. Brodie imparted to Seton a precocious interest in the flora and fauna they observed as historic representatives of complex ecological communities living in dynamic interaction with their environment. Inspired by Brodie, Seton extended his local natural knowledge to the wild animals of the Canadian north, blending science, art, literary fiction, and a passionate appreciation of aboriginal knowledge to challenge humanity's conventional stance outside of nature. His work, while marking a fundamental shift away from traditional natural history to promote not an anthropomorphic but rather a zoomorphic understanding of nature, encountered credibility problems as Seton conflated several genres of knowledge almost indiscriminately.

Field Stations at Sea: Pedagogy and Practice in the Physical Environmental Sciences

Organizer/chair: Ronald E. Doel
University of Utah / Oregon State University

How new recruits to science learn the ropes of their new profession is a key question in the history of science. Yet archival collections are often silent about graduate training, since most scientists only begin saving their papers once their professional careers are established. In the physical environmental sciences many graduate students after World War II were introduced to the practices and culture of science not in a classroom but while at sea. They experienced oceanographic research vessels as field stations, as participants on extended voyages. While serving on these floating field stations, they learned how to formulate successful research projects while absorbing the standards of their disciplines.

Historian David Kaiser has argued that scientists' training remains largely ignored in the history, sociology, and anthropology of science. The floating field stations of the second half of the twentieth century have received even less attention than laboratory-based research programs, despite their importance for understanding fundamental scientific practices. This paper focuses on the experiences of young researchers recruited to the Lamont Geological Observatory of Columbia University, directed by Maurice Ewing, from the late 1940s through the 1960s. It draws not only on extensive archival collections, but also on a rich set of oral history interviews with graduate students recruited to this research school. Central to these narratives were studies underway in the polar regions, of particular interest to U.S. patrons of the physical environmental sciences, including the Pentagon, in the first decades of the Cold War.

Julia Lajus
Russian Academy of Sciences, St. Petersburg, Russia

Transference of knowledge in marine sciences: field stations, expeditions and applied research in the Russian North in the end of the 19th – first half of the 20th centuries

This paper is focused on the development of field studies in the Russian European sub-Arctic and Arctic seas in the end of the 19th – first half of the 20th centuries, which were driven by the interplay of different purposes, interests and groups: economical needs to colonize the region, scientific and teaching interests of the universities, military and resource use interests. The paper describes the rise of networks of field stations in the Russian North, analyses different methodologies of field research, reveals the everyday life and scientific practices on the stations and in the expeditions. The scientific network in the Arctic formed through the confrontation between interrelated places of knowledge - field stations and research vessels - towards their unification and placement into the same centralized network. The paper is based on the understanding of the Russian stations and expeditions as a part of international networks, including ICES and IPY activities, which allowed the intensive transference of tacit knowledge of field research in

the Arctic. I look on the transference of the scientific practices between northern countries, especially on the influence of Swedish and Norwegian innovative methodologies of marine research on the Russian scientific practices, but also on the application of knowledge obtained in other regions to the specificity of field research in the Arctic.

Michael Harbsmeier (discussant)
Roskilde University, Denmark

END

2.11 Ways of Knowing Within and Through Games and Play

Organizer/chair: Casey O'Donnell
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Games and play occupy a particularly ambiguous space in how we come to know and the ways in which we know, after all, it's just games. Games can be considered valuable (educationally and developmentally necessary), frivolous (purely pleasurable), achievement oriented, or downright subversive. Despite the explosive growth of video games, the development of Game Studies, and the dramatic rise of research examining game spaces, games are still largely regarded as less rigorous pursuits for researchers. If thinking of science as a game of Go can offer us insights into that epistemic endeavor (Latour, 1986), then likely other games or ways of playing can offer insight into the ways we come to understand the world around us. This session demonstrates both the broad relevance of studying games at an empirical level, as well as why other research may be interested in turning to games for understanding their pursuits. It brings together scholars seeking to look at and through games and play as lenses into broader social phenomenon. It seeks to establish a middle ground between Science Studies and Game Studies where both become relevant to the other theoretically and empirically.

Douglas Thomas
University of Southern California

Blurring the Boundaries Between Worlds: Conceptual Blending in Virtual Worlds

This paper examines the epistemological implications of Mark Turner's notion of conceptual blending in virtual worlds. Doing so challenges both the implicit and explicit framing of virtual worlds as having "inside" and "outside" or "real" and "virtual" dimensions and instead proposes virtual worlds as spaces which collapse such traditional binary constructions and allow us to consider models of learning in virtual worlds predicated on experience rather than transfer of information through and across boundaries.

Hector Postigo and Sean Lawson
The University of Utah and Rensselaer Polytechnic Institute

A Hopeful Mirror: Military Games as Visions of the Future Army

This study will analyze the use of video games by the U.S military from a communication theory perspective. The U.S military has increasingly been sponsoring the development of video games such as America's Army and Future Force Company Commander (F2C2) initially for the purposes of training but increasingly for the purposes of recruiting. We do not seek to answer whether these are effective training or recruiting tools but rather

how the military constructs itself through game play? Some have noted it is possible that games like America's Army and F2C2 are rhetorical tools meant to persuade would-be recruits. This study would seek to answer this question and assign a multi-valenced meaning to recruit, suggesting that the games are not only used for the military to construct a vision of itself for others but also serves as a hopeful mirror, a vision of what the military wants to be.

Casey O'Donnell
Rensselaer Polytechnic Institute

"It's like Spy vs. Spy": Playing the Global Video Game Industry Game

At one time business was said to be best characterized as a war. For video game developers, it is better envisioned as a game. This paper articulates the ways both the game industry as a whole, and the work within it, is coupled and played, in ways very similar to a game. For some it is imagined to be a classical game, a game of Go or a game of Chess. Others prefer to think of it through the newer mediums they create, like Spy vs. Spy, or Warcraft, or a massively multiplayer online game. Each provides an insight into how business and work gets done, or doesn't get done. This paper also examines the consequences of these metaphors, as well as strategic sites for intervention for altering the way the game is played. This interactive or played nature of the video game industry intensifies relationally defined aspects, such as race, class, gender, disciplinarity, time, and place. Each begins to matter more as things are constantly reconfigured and played in new ways. Even understandings of what games can possibly be affects the way its participants play.

Rebecca Carlson and Jonathan Corliss
Temple University and Columbia University

Found in Translation: The Global Circulation of Video Games

The phrase "Lost in Translation" is often used to suggest that—despite best intentions—subtle nuances of meaning or expression of thought always get lost when language, regardless of form, is translated. In the past, commodities that crossed borders were treated with as much translation as was necessary to make the product useful, workable or safe. In the self-consciously global market place of today, the problematics of translation are implicit; the rhetoric that local markets desire commodities that appeal to their local sensibilities is well established. In particular, technologies and information—websites, news stories, images, video games—circulating with ever-increasing speed, are subject to conscious transformations contained within conventional notions of translation. This practice of localization, as rooted to cultural ideals and nation-state boundaries as it is to language, is becoming an increasingly standard way to approach the production, distribution—and thereby also shaping the consumption—of global commodities. This paper is specifically interested in examining the unique conditions and particular demands that surround the localization of video games—an exceptionally rich example of a global commodity.

Shira Chess
Rensselaer Polytechnic Institute

What Do Feminists Know About Play, Anyway?: Understanding Feminism Through Digital Play

There an awful lot of feminisms, these days. Despite the splintering of feminism into an exponential number of categories (2nd wave, 3rd wave, post, cyber, and eco to name just a few), they all seem to have one serious flaw in common: all work and no play. And after all, why should play matter to a series of serious social movements? But play can also be seen as the key to unlocking the epistemological structures behind how we understand women, feminism, and gender. In this paper, I consider play in general, and digital play in particular, to shed light on these concepts. I will ultimately show the tension that has developed between women and play, and why reclaiming this notion of play should be pivotal to all of the feminist movements.

Robertson Allen
University of Washington

The Spaces and Soundscapes of Games and Game Rooms

Although the heyday of video game arcades is arguably situated in the past, such locations still serve as significant social areas for a variety of individuals. These places, often situated within shopping malls or university student centers, incorporate both the spaces of the surrounding physical environment and the spaces of the various game worlds. In keeping with recent scholarship which focuses upon video games as socially situated practices, this paper is an initial attempt to analyze these arcade spaces in relation to social theories of space and place. In particular, Foucault's writings on "heterotopias," which, in contrast to utopias, are "real sites … outside of all places, even though it may be possible to indicate their location in reality," can be useful when applied to game spaces. This paper uses the soundscape of game rooms as a starting point in this investigation, and it seeks to engage a wider variety of epistemological approaches (hopefully articulated in other panel topics) to games and gaming.

T.L. Taylor
I.T. University of Copenhagen
Discussant

END

3.1 A Hands-On Mapping Workshop for Exploring Different Representational Strategies for Describing Complex Technoscientific Domains

Organizer: Atsushi Akera
Chair:
Rensselaer Polytechnic Institute
akeraa at rpi dot edu

For this "working session," we will be conducting a hands-on workshop for those who would like to discuss and explore the relative merits of the different "mapping" techniques recently advanced in the field of STS. From the mapping strategies presented by Adele Clarke in Situational Action, to the ecologically inspired mapping workshops and techniques developed by Peter Taylor (Unruly Complexity), to the semiotically-inspired representation for an "ecology of knowledge" advanced by Atsushi Akera (forthcoming in Social Studies of Science), we now have a handful of different representations, and processes, for mapping the complex sociotechnical arrangements that are constitutive of any technoscientific domain. While Clarke, Taylor, and Akera will open the session with an initial discussion and/or demonstration of their methods (as described in the individual abstracts, below), most of the time will be reserved for hands-on exploration of different mapping strategies. Participants are therefore encouraged to bring their own projects to the table, regardless of the current stage of their research. They will then be encouraged to try out different mapping techniques, and evaluate whether or not these techniques help them in their efforts to reformulate, reflections upon, and/or analyze their projects. This should then segue into an open conversation about the relative merits of the different mapping techniques, especially as they relate to differences in topic, disciplinary orientation, and the relative maturity of each project. All participants are encouraged, prior to the workshop, to review the pre-circulated papers posted under the organized "working sessions" site for the 4S annual meeting; in addition, they are asked to familiarize themselves with the set of reference texts (previously published works) made available at the URL: www.rpi dot edu/~akeraa/workshop/4S-2007.

Adele E. Clarke
University of California San Francisco

Using Situational Analysis to Map STS Projects

Situational analysis is a new method of analysis for qualitative research that can be used with interview, ethnographic, historical, visual, and/or other discursive materials, especially useful for the kinds of multi-site research characteristic of STS projects. Situational maps lay out the major human, nonhuman, discursive and other elements in the research situation of inquiry and provoke analysis of relations among them. Through mapping the data, the analyst constructs the situation of inquiry empirically. The situation per se becomes the ultimate unit of analysis and understanding its elements and their

relations is the primary goal. Situational mapping can be used to design and conduct research in a flexible and iteratively responsive manner across the duration of the project. See www.situationalanalysis.com for more information on SA.

Peter J. Taylor
Science, Technology & Values Program, UMass Boston

Diagramming of Intersecting Processes
Intersecting processes diagrams help students and developers of research projects to

 1.) visualize the development of scientific-social phenomena in terms of linkages among processes of different kinds and scales that build up over time;

 2.) identify places where detail is missing and where further inquiry is needed; and

 3.) contrast the implications of thinking in terms of direct causation (like spokes going to a hub) with "heterogeneous construction" (Taylor, Unruly Complexity, U. Chicago Press, 2005).

My initial presentation will speak about demonstrate these different benefits to be derived from this class of sociotechnical representations.

Atsushi Akera
Rensselaer Polytechnic Institute

A Demonstration of the "Ecology of Knowledge" Representation as Applied to an Early Stage Historical Project on the History of Engineering Education Reform

This paper demonstrates how my semiotic and ethnomethodologically inspired representation for an "ecology of knowledge" can be used to reflect upon and analyze an early-stage historical project on the history of engineering education. Following World War II, engineering educators went through a rather tumultuous period during which they set out to redefine the technical foundation and social organization of their discipline. Yet, although the early Cold War years, and Sputnik in particular, brought new pressures to engineering schools and engineering curricula, those familiar with US engineering schools will immediately recognize that this call for "engineering education reform" also emerged out of perennial habits for curricular reform that remained integral to academic engineering institutions. I use my representation for an "ecology of knowledge" to map out the practices of curricular evaluation as carried out by the American Society for Engineering Education; of faculty self-governance at MIT and its contribution to the Lewis Survey of 1949; and of weighing professional interest as embedded within the habits of the Engineers' Council for Professional Development. These practices placed engineers in direct dialogue with a historical transformation in the technoscientific

environment, and they redirected contemporary engineering curricula and identities—
"engineering science," and even the field of STS, partly owes its origin to this dialogue.
As a demonstration, this paper describes how the "ecology of knowledge" representation
helps to precisely identify institutionally embodied practices that bring about
sociotechnical change; it also demonstrates how the representation can be used to
facilitate a theoretically-driven historical project. (Selected excerpts from this pre-
circulated paper will be used to provide an initial demonstration during the actual
mapping workshop/working session.)

1. I've been in touch with Sergio (Sismondo) about the proposed working session format,
and the necessary arrangements for pre-posting papers.

2. If possible, and IF the lunch period is about the same duration (or more) than a full
session, we'd like this to be a "lunchtime session." If so, please add the line: (A lite lunch
will be provided for all participants.)

END

3.2 STS & Information Studies III: Doing STS in Information Schools (Roundtable)

Organizers: Jean-François Blanchette
Information Studies, University of California, Los Angeles
blanchette at ucla dot edu
Geoffrey Bowker, Santa Clara University <gbowker at scu dot edu>
Chair: Jean-François Blanchette, Information Studies, UCLA blanchette at ucla dot edu

Over the last ten years, STS and Information Studies (IS) have cross-fertilized both professionally and intellectually, offering academically distinct yet synergistic "ways of knowing" science and technology. STS PhDs have found IS departments to be congenial homes for their research interests, while IS scholars have borrowed from the STS toolbox for theoretical tools to better understood information processes, institutions, and technologies. This stream of five sessions seeks to foreground both the professional opportunities available for STS graduates in IS school and research areas that have thrived at the intersection of the two fields. The stream will commence with a roundtable featuring STS scholars active at the IS/STS boundary, and a discussion with the audience on issues of professional development in the field of Information Studies. The stream will follow with four sessions showcasing research areas particularly benefiting from this cross-fertilization: archives & databases, cyber-infrastructure/e-Science, scientometrics, and scientific information.

Paul Edwards
School of Information, University of Michigan

Nancy van House
School of Information, University of California, Berkeley

Leigh Star
Santa Clara University

Leah Lievrouw
Information Studies, UCLA

Ole Hanseth
Universitetet i Oslo

END

3.3 Assemblages, Eduscapes, and Knowledge: A Critical Antropology of Knowledge Society

Organizer/chair: Francis Lee
Linköping University
frale at tema.liu.se
Ulf Mellström, Luleå University of Technology, ulf.mellstrom at ltu.se
Per-Anders Forstorp, Royal Institute of Technology, forstorp at kth.se

In the early 21st century global assemblages of people, machines, knowledge, capital, and imaginaries create specific flows and places of educational possiblity and impossibility, or following Mellström (2006) eduscapes that are deeply implicated in defining valid and desirable knowledge on a global scale. The eduscapes consists of hubs of knowledge and capital, like Bangalore, Silicon Valley, or Singapore, which epitomize the imaginaries of knowledge society. These hubs are hot-spots of cultural and epistemological negotiation that draw flows of people, knowledge and machines and create zones of connectivity and disconnectivity that define individual life trajectories, and epistemologies. The eduscapes consist also of the concrete ways of knowing, patterns of migration and employment, and the narratives in which these global educational "songlines" are enacted. The idea of a knowledge society is, on the other hand, an expression of a politics of knowledge depicting this as an asset primarily of the Western world or the global conglomerates of capital. The global eduscapes and the knowledge society are thus, to some extent, at odds with each other; representing different anthropologies and ideologies of knowledge.

This session invites critical interventions into Knowledge Society seen as a global assemblage or eduscape that try to problematize contemporary processes of knowledge negotiation in relation to global flows education and relations of power. We invite contributions that criticize the "ownership" or "stewardship" of knowledge society as this is expressed, for instance, in the political canons of the Western world and in business, science and technology practices.

Ulf Mellström
Luleå University of Technology

Eduscapes: Knowledge routes and travel in the world of higher education

This paper will look into to some 'grass-root' aspects of eduscapes by considering spatial practices of a number of interviewed students and lecturers in Sweden and Malaysia coming from a vast range of countries. Their experiences of transnationalism within the realms of education and research will be serving as a point of departure for discussing global cultural transformation and stability in the world of higher education.

In the present-day transnational practices of higher education and research where students travel the globe in search and dreams of knowledge, a better life and future career

possibilities, it seems that routes and imaginaries reproduce and follow geopolitical patterns of power. A constant stream of students from the third world countries migrates to universities and knowledge hubs in different parts of the world on a large scale. This flow of people, mostly flowing from the south to the north, is part of what here is labelled eduscapes. This theoretical handle refers to the contemporary transnational flow of ideas and people in regard to research and higher education and where nodes of knowledge centres and peripheries shifts over time but are connected through modern communication technologies and different epistemic, ethnic, and student communities. As a cultural phenomenon eduscapes has its historic roots in the 'bildnungsreise' as much as labour migration and is in no way something particular to our time but rather following age-old traces and patterns of movement in the name of diasporas, colonialism, postcolonialism, exploration and 'conquistadorism'. However, a new dimension of concurrent eduscapes is the intensification, diversification, and differentiation of 'Scientific' knowledge and higher education on a global scale not experienced before.

Per-Anders Forstorp
Royal Institute of Technology

What to think about when you are exporting knowledge society

Questions concerning the expectations and assumptions concerning knowledge society are an important part of a contemporary political-educational assemblage with a large following. The vision of a knowledge society is often erroneously portrayed as a neutral mechanism of an intellectual market, while on the other hand it is overflowing with ideological constructions, power ambitions and strategies for governance. Analyzing the ideological character of knowledge society in its dimensions of commodification, instrumentalism and dominance is an important part of contemporary critique of hegemony.

The Royal Institute of Technology (KTH) in Stockholm, Sweden is one actor who has embraced its educational mission on a global scale. For the most part this consists in maintaining partnerships with universities and institutes across the world, both in the industrialized West and in emerging economies of the East and South. These partnerships enable students, teachers and researchers many possibilities of exchange. Another form of cooperation is the assignment given to, among others, KTH by the Government of Pakistan to establish a new institute of technology in the industrial region of Sialkot in the northern province of Punjab. This has been described as "exporting knowledge society" which prove to be a very apt case in point showing the convergence of commodification and knowledge. This particular form of cooperation will be the case for the present paper through which will be explored what you need to know if you are about to sell or export knowledge society.

Karin Skill
Linköping University

Legitimizing Indigenous Knowledge as a Mean to Challenge Edcuscapes?

During the last decades various organizations and scholars have demanded that what has been termed indigenous, traditional and/or local knowledge ought to be acknowledged, especially in connection to environmental movements and within development projects. The attempts to widen the definition of knowledge therefore have a political nature and are central as a mean to empower or strengthen indigenous people. In this context knowledgeable actors are at the heart of the matter.

This paper will draw on an ethnographic study performed with participants in the Kawsay adult education project in Bolivia, and their specific conceptualizations of their knowledge. The ethnographic study is based on oral histories and semi-structured interviews with the participants in order to capture their definition of knowledge and what the organization has contributed with. Kawsay is an organization that specifically attempts to legitimize and upgrade what they call indigenous knowledge, by creating a university structure for the education and maintenance of indigenous knowledge. In focus of the analysis are the possibly different definitions of knowledge and science that may diverge from the dominant "rationalistic" and mainly western view of them. The analysis will depart from previous theoretical challenges by multiculturalism, and highlight whether the concept of indigenous knowledge is the knowledge held by indigenous people or defined by a different cosmology. Thereby the paper will investigate whether attempts to legitimize knowledge systems may work to challenge current "eduscapes," or if it is part of the very same phenomena.

Francis Lee
Linköping University

Neocolonial Technopedagogies

The technology of distance education is deeply entangled with the global eduscapes of the 21st century. It makes possible processes of deterritorialization and reterritorialization; it creates hubs and dead zones; and is deeply involved in neocolonialist struggles of knowledge dissemination.

This paper discusses the role of standardization work in relation to student assessment technologies and epistemic processes of defining valid and correct ways of learning, being, and working. It argues that the heterogeneous flow of assessment technology is implicated in a specific dispositif where bodies of knowledge are created, disseminated and recreated, and which lead to highly particular modes of organizing education.

This technopedagogical standardization work is treated as a part of a neocolonialist process where the western imaginaries and subjectivities of 'knowledge society' is exported to the third world through technologies of measuring and knowing. The technopedagogics of measurement and assessment thus contribute to the dissemination and creation of specific flows of knowledge, images, subjectivities, and people.

The paper draws on historic and contemporary data about classification and differentiation in distance education.

END

3.4 Embodied Translations, Translating Embodiment

Organizer/chair: Stefan Beck
Humboldt University Berlin, Germany
stefan.beck at rz.hu-berlin.de

Recent developments in biomedical research, particularly in the life sciences and psychiatry, are increasingly beginning to diffuse the boundaries between inside and outside: narratives of evolution, epigenetics and imprinting encroach upon social domains. These developments are affecting the manifold translations involved in the practices of knowing oneself, knowing others and being known by others. This session attempts to begin to develop a framework for a systematic investigation of translations at the intersection of professional human science research and the patterning of everyday practice and experience: (1) Translations alter expert systems, such as research, administration or economics, through shifting concepts, narratives and practices related to bodies, selves and sociality as well as their interactions. (2) They change the practices by which different conceptions of self become entangled with perceived and experienced notions of the body, including body concepts, images and embodiment. (3) They change the ways that interactions with the social Other are construed. (4) They change the dynamics of social systems by investing them with new kinds of classificatory mechanisms, political priorities as well as moral practices.

Some of these dynamics have been discussed with concepts such as looping, biosociality, somatic individuality, the social brain or local biologies. Yet we believe that a more systematic overview and analysis of these emerging constellations is lacking. This session brings together material from a number of projects (including evolutionary psychiatry/anthropology, German politics of cardiovascular prevention, Cypriot bone marrow donation) to illustrate some of the relevant perspectives, analytical in-sights and difficulties.

Allan Young
McGill University, Montreal

MANUFACTURING EPIDEMICS: EPIDEMIOLOGISTS RESPOND TO 9/11

This paper focuses on the mass production of a psychiatric disorder, posttraumatic stress disorder (PTSD) of the virtual kind (my term). I describe how psychiatric researchers and their audiences acquired knowledge and convictions about threats, trauma (PTSD), and resilience following the terrorist attacks of 9/11. The mass production of PTSD of the virtual kind is something entirely new. However, it is not an aberration nor is useful it useful to dismiss it (as some critics within psychiatry have) as an example of "bracket creep," i.e. the unwarranted extension of the iconic classification ("real PTSD"). To the contrary, PTSD of the virtual kind is a historical development of a "form of life" – the posttraumatic syndrome – that began to take shape towards the end of the nineteenth century and has been progressively revised, elaborated, and morphed multiple times,

usually in association with episodes of world historical violence – World War I (the rise and fall of traumatic hysteria, the birth of Freud's traumatic neurosis), the Vietnam War (PTSD, a further development of the traumatic neurosis), and post-colonial convulsions (trauma becomes a template of globalized suffering), and now the Global War on Terrorism.

Jörg Niewöhner
Humboldt-University, Berlin

Manufacturing Selves Preventively

Cardiovascular disease has long been identified as one of the major sources of increased mortality and morbidity across the globe. Discussions about aetiology have given primacy to physiological factors such as a positive energy balance and genetic predispositions for insulin resistance. However, emerging concepts in molecular biology (epigenetics) now combine with epidemiological findings to shift the focus of attention onto the interaction of body and environment: imprinting, obesogenic environments, effects of Westernisation.

This shift in aetiological hypotheses is beginning to change individualistic rationalities inherent in primary prevention and health promotion programmes to incorporate a socially and temporally extended notion of the embodied self. In Germany as in most Western countries, "scouting prevention" has become the strategy of choice. Scouting essentially refers to actively seeking out those most at risk and least likely to change. This type of prevention is not simply targeted at physiology anymore but instead installs itself as an assemblage aimed at producing compliance on different levels of analysis from the molecular to the social.

This paper reports on findings from a series of ethnographic interviews within medicine, economics and politics as part of a larger research cluster: preventive self. Understanding scouting prevention as a material-semiotic network, the analysis focuses on (1) different concepts of the body integral to the production of prevention programmes; (2) the conceptualisation of social, material and symbolic factors in cardiovascular aetiology and (3) the re-configuration of embodied selves through preventive interventions.

Stefan Beck
Humboldt-University, Berlin

Manufacturing Histocompatible Selves: learning to know oneself (and others) through bone marrow transplantation

The transplantation of 'solid' organs or tissues raises a broad range of long standing questions in the social and cultural sciences, discussed under the rubrics of altruism, disinterested as well as self-interested exchange, of reciprocity and solidarity, of anonymity and mutual obligations. However, organ-donation does not only create the problematic for all persons involved how to interpret the donor-recipient relation (e.g. as

biological and/or as spiritual), but also affords a reconfiguration of – culturally contingent – commonsensical notions of self, body, soul, and the social whole through the existential confrontation with medical concepts, techniques and practices. Drawing on ethnographic data and interviews with donors and recipients of bone marrow in Cyprus, the paper explores how recipients and donors of bone marrow cells learn to conceive of themselves applying medical concepts and how they blend these concepts with vernacular notions of bodily integrity, biological kinship, and in-dividuality.

Helen Cox
University of York, UK
hc511 at york.ac.uk

Molecular Diagnostics and Clinical Effectiveness: Innovation, Communication and Clinical Decision-making

This paper will examine clinicians' response to new molecular diagnostic tests for haematological malignancies, how results are presented and communicated, and the subsequent impact on clinical decision-making. The study brings together haematologists, health economists, sociologists, and epidemiologists, to examine clinical decision-making in a Haematology network. Genetic diagnostics is regarded by the UK Department of Health as important to future health service delivery and it offers a powerful tool in clinical decision making, but there is a range of factors affecting these clinical decisions regarding the interpretation and translation of risk calculations, test utility and treatment pathways that need to be examined to determine how new techniques might be more effectively adopted.

Questions include: What diagnostic information is translated and who does the translation: both between the laboratory and the clinician and between the clinician and the patient? What is the point at which treatment is considered ineffective and how is this information communicated to the patient? How does the level of probability at which it becomes justifiable to expose the whole patient group to therapy to salvage a small number become stable?

The use of probabilities in making such decisions is a particularly difficult area, with widely differing ideas among Clinicians and Patients about acceptable/unacceptable levels of risk and how these are communicated. The development and interpretation of effective prognostic techniques could have a major clinical and economic impact. It is therefore crucial to understand clinical decision-making within this broader context and thereby those factors that shape the likely uptake and embedding of new technologies, such as molecular diagnostics, within clinical practice.

END

3.5 Field Science and Embodied Knowing in an Era of Virtuality

Organizer/chair: Jennifer Cool
University of Southern California
cool at usc dot edu

What does it mean to be a field scientist? What distinguishes field study as a way of knowing? Born of the natural history sciences in the nineteenth century, the practice of studying subjects in their environment, rather than as specimens or exhibits, is common across a wide range of disciplines from anthropology to watershed science. Field study requires journeying to the field, embodied investigation, bringing back the data, and translating it into whatever counts as knowledge in a particular context. This session brings together papers on field studies in diverse contexts, to consider what distinguishes this way of knowing as valid and valuable and what challenges it in a era of virtuality and mediated experience.

Tom Boellstorff
University of California, Irvine

The Ethnography of Virtual Worlds

Anthropology has been slow to recognize the promise of ethnographic methods for the study of virtual worlds. Drawing upon material from my forthcoming book Virtually Human: An Anthropologist in Second Life, based upon two and a half years of ethnographic research in the virtual world Second Life, I argue that ethnography holds great promise for illuminating culture online, but not because it is traditional or old-fashioned. Ethnography has a special role to play in studying virtual worlds because it has anticipated them. Virtual before the Internet existed, ethnography has always produced a kind of virtual knowledge. I demonstrate that because virtual worlds are inhabited as places, ethnographic inquiry can play a crucial role in investigating new forms of selfhood and society online. This is because anthropology has always been about avatarizing the self, standing virtually in the shoes (or on the shores) of another culture.

Elizabeth Losh
University of California, Irvine

Field Studies in Digital Rhetoric

The emerging field of digital rhetoric has been conventionally associated with practices of close reading and isolated scholarly contemplation, but as rhetoric in electronic venues become increasingly important in the public and even political spheres, it is vital that field studies be

employed to preserve what Erkki Huhtamo has called the "crypto histories" of the

process of message-creation by competing stake-holders employing technology. In other words, when it comes to digital government, it may be important to consider the digital library that was not constructed, the official website that was allowed to go dead, or the online federal
training that was abandoned, when analyzing the built infrastructure of what Jane Fountain has named "the virtual state." Internal project documents, interviews with team members, and physical inspection of the site of collaborative practices that use technology can be essential to
understanding how the final product may reflect competing discourses about state rhetoric and new electronic media and the deliberative processes instantiated in the interactive visual artifact.

Jennifer Cool
University of Southern California

Walking the River: Reflections on Fieldwork in the Information Age

The practices of data collection and production collectively known as fieldwork, field studies, or field sciences, have historically occupied lower status than their laboratory counterparts, yet they remain crucial across a range of intellectual and scientific disciplines. This paper approaches questions of how field studies have been reconfigured in the context of information technologies through close reading of a particular fieldwork story. Told by a fluvial geomorphologist (one who studies land forms carved by water on the earth's surface) to a social anthropologist (this author), the story is retold in this paper as a parable. As such, it is instructive of both threats to and openings for fieldwork—in particular, for ethnographic fieldwork—as a way of knowing in an age when many practices of data gathering and knowledge production (e.g. mapping, measuring, recording) are interpolated with new media and information technologies.

Ethnographic fieldwork, hallmark and central method of social anthropology, has spread far outside the discipline in the last twenty years. Yet, within anthropology, conceptions of "the field" as bounded object of study, and of fieldwork as a way of knowing, have since the 1960s become increasingly problematic practically, epistemologically, and ideologically. While information technologies have been implicated in the processes and phenomena reconfiguring the field as an object of study (e.g. Gupta and Ferguson, Appardurai), this paper takes a different angle on the reconfiguration—one that is at once more narrow in its focus on fieldwork as embodied investigation and more general in considering commonalities in the experiences of fieldworkers across disciplines as varied as social anthropology and watershed science.

Discussant: Douglas Thomas
University of Southern California
END

3.6 South Asia and Epistemologies of Postcolonial Governmentality

SESSION CANCELLED. REPLACED WITH:

Faculty Panel: Getting Your First Academic Job (sponsored by the student section of the 4S)

3.7 Learning Together, Learning Apart: The Contradictory Dynamics of Mixing Disciplinary Knowledges

Organizer/chair: Richard Norgaard
University of California, Berkeley
norgaard at berkeley dot edu

Universities and science-driven agencies are largely structured by historic scientific boundaries and beliefs. One of these beliefs is that good science is logically consistent and can be independently verified by others. Verifying the broader implications of disciplinary scientific knowledge for setting research priorities or advising on policy, however, requires scholars with the same disciplinary expertise, i.e. scientists who hold the same values and assumptions about reality beyond the discipline. In academe the majority of scientists are responding slowly to developments in fields beyond their disciplines. Some developments, such as those in evolution that are uniting some biologists into a broad discussion about the systemic nature of biology, are so striking they cannot be ignored. But for the most part, departmental structures favor disciplinary depth and cultures of aloofness.

Now, however, we see scientists from a variety of disciplines working together on some of the most important science for public policy: understanding the complexities of climate change and ecosystem management. Social and natural scientists discuss and break down disciplinary assumptions, build new working assumptions, and bridge critical issues that cut across disciplinary boundaries. Much like disciplinary knowledge, the new collective understanding is not independent of the collective learning process that generates it. Science-driven agencies also seek expert guidance on topics that cut across disciplinary boundaries.

This session examines how mixing disciplines reveals existing beliefs, broadens our understanding of science, and challenges scientific and science-driven institutions.

Richard B. Norgaard
University of California, Berkeley

The Millennium Ecosystem Assessment as a Construction Across Scientific Communities

A simple systems model connecting social and ecological systems, with ecosystem services being a key link to human well-being, guided the assessment of the literature on ecosystem change by 1400 scientists from diverse disciplines, cultures, and economic positions. The literature that was assessed however, consisted of ecological analyses that did not connect to social systems and vice versa, analyses conducted in numerous different frameworks that varied in temporal and spatial grain and scope, and with a diversity of drivers and impacts that eluded aggregation. Furthermore, the participants

soon realized that little could be said about critical thresholds of ecosystem changes or population crashes, especially when there are interactive drivers of change. Nevertheless, through a discursive process, the scientists came to a comprehensive, reasonably shared, though frequently very qualified, assessment of what the "literature says" about future scenarios for ecosystem transformations and their human implications.

Though diversity in participants was deliberately sought, there was also a process of self-selection. Linkages were made, in part, by drawing on the field and personal knowledge of participating scientists that had been excluded from their disciplinary analyses. A shared position, however, was also reached through the willingness of the participants to let go of assumptions common to their own scientific communities and construct better working assumptions between them. Tensions arose as scientists returned to their own communities making arguments with conflicting premises.

Leah Nichols
University of California, Berkeley

The Academic Labyrinth: Understanding the Infrastructures of Disciplines

The university has long been a primary site for the construction and maintenance of disciplines. The entrenched administrative, professional, material, and social infrastructures of academia perpetuate historical disciplinary boundaries and privilege disciplinary knowledge. Such structures curtail interdisciplinary efforts and leave both faculty and students ill-prepared to participate in collective learning processes.

Understanding the structures that perpetuate disciplinary boundaries is a first step toward fostering the development of knowledge through interdisciplinary and collective learning efforts. Using the University of California, Berkeley as a case study, I have interviewed 30 Berkeley biologists and administrators to understand the decision making calculus employed in setting research agendas at both the individual and institutional levels. The resulting data reveals the breadth of factors that both professors and departments take into consideration as they negotiate their futures, including: maintaining academic strength, sustaining funding flows, and developing sufficient track records.

Professors and institutions alike employ a wide range of deliberate strategies as they struggle to survive and flourish in academia. Such a complex maze of administrative, professional, and social norms is often easier to navigate from within a recognized discipline. This paper (1) elucidates the administrative, professional, material, and social structures that shape academia and (2) suggests ways in which the university can foster interdisciplinarity and train scientists to become active participants in collective learning processes.

Douglas M. Bushey
University of California, Berkeley

Interdisciplinary Deliberation and Dis ciplinary Hegemony: Expert discourse in the Clean Development Mechanism

The Clean Development Mechanism (CDM) is an institution created by the Kyoto Protocol to provide an incentive for investing in greenhouse gas reduction projects in developing countries. The sponsors of these projects quantify the reduction in emissions that their projects generate, and sell these emission reductions to emitters in the industrialized world. The Executive Board of the CDM must approve a "methodology" for each project. These methodologies are quantification procedures that determine the amount of greenhouse gas emissions that the project will be said to have prevented. CDM methodologies are both highly technical and highly contentious. Each methodology consists of an agreement about two things – how to measure the actual emissions from a project, and how to determine the emissions that would have taken place in the absence of the project. The second value, the baseline, is generally more contentious, as it involves agreement on an unverifiable counterfactual based on economic, political and social assumptions about host community. This paper traces the trajectory of the expert discourse surrounding CDM baselines from the formation of the CDM through the present. I argue that because baselines are so clearly constructed rather than deduced, it became difficult for experts to use technical language to impose discursive closure on the debate. As experts came to terms with this, newly deliberative procedures began to emerge. When these procedures proved too slow and unpredictable for the market that was to depend on it, a "cost minimization" discourse arose, streamlining the process, but silencing the interdisciplinary deliberation.

END

3.8 Postphenomenological Research II

Organizer/Chair: Don Ihde
Stony Brook University
dihde at notes.cc.sunysb dot edu
Catherine Hasse, Denmark University of Education
caha at dpu.dk

Peter Paul Verbeek
University of Twente, NL

A postphenomenology of ultrasound

Postphenomenology can be seen as a renewal of classical phenomenology, which incorporates the contextual, situated and embodied character of contemporary continental philosophy. Just like classical phenomenology, it aims to overcome the separaton of subject and object which characterizes modernist thinking, but rather than relating subject and object to each other, it invistigates how subject and object constitute each ohter in human actions and perceptions, and how this mutual constitution is mediated, not only linguistically but also materially. A postphenomenological analysis of obstetrical ultrasound can illuminate this approach in practice. Ultrasound is not simply a functional means to make visible an unborn child in the womb. It helps to shape the way the unborn child is given in human experience, and in doing so it informs the choices his or her expecting parents make. Because of the ways in which ultrasound mediates the relations between the fetus and the future parents, it constitutes both fetus and parents in specific ways. This technological mediation brings about a number of 'translations:'

Ultrasound isolates the fetus form the female body. In doing so, it creates a new ontological status of the fetus, as a separate living being rather than being part of the unity with a pregnant woman. This creates the space to make decisions about the fetus apart from the woman inwhoe body it is growing.

Ultrasound places the fetus in a context of medical norms. It translates pregnancy into a medical proces; the fetus into a possible patient; and congenital defects into preventable suffering.

As a result, ultrasound constitutes the parents of the fetus as decision-makers regarding the life of their unborn child. Its role is ambivalent here: on the one hand it encourages abortion, making it possible to prevent suffering; on the other hand it discourages abortion, enhancing emotional bonds between parents and unbord child by visualizing 'fetal personh

Frances Bottenberg
Stony Brook University

First Person Reports and Cognitive Psychology

A defense of the scientific legitimacy of the first person report in experimental psychology and philosophical psychology: More nuanced definitions of scientific evidence and experiment, which give central importance to the quality of being a revealing of 'x' as opposed to being a proof of 'x' are developed here with particular reference to consciousness studies. Philosohical support for this move is drawn from Edmund Husserl's critique of the ontological reversal in the natural sciences and a defense of an Aritotlian-Heideggerian theory of truth. I will do an analysis of T.I. Nielson's 'alien hand' experiment in terms of its paradigm-shifitng design and its unexplored potential.

Robert Rosenberger
Stony Brook University

Postphenomenological Imaging: the Debate over the Eberswalde Delta on Mars

A philosophical perspective now often called 'postphenomenological' offers a new concrete analysis of human bodily experience of technology. Here, I propose a method for appling thse insights to the examination of ongoing debates in science involving image interpretation. The method involves re-conceptualizing the images at issue to be open to multistable interpretations, exploring the stategies of interpretation offered by each side of the debate, and investigating the different relationships each account has with the mediating imaging technologies. My example here concerns a centem;orary debate over the geological history of Mars. A recent discovery of a 'fossilized' river delta in a Martian crater named Eberswalde offers strong proof of a history of running water. However, researchers disagree about what the details of these formations imply about he sort of water flow that must have occurred. Taking concepts and context from postphenomenology, I analyze the relations on each side of this debate in rlation to the mediating technologies used, including the Mars Orbital Camera, false-color image creation, laser altimeter readings, thermal emisions imaging, computer simulations and stero image analysis.

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3.9 Ask your Doctor About… Science and Commerce in Canadian Health

Organizer/chair: Mavis Jones
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mavis.jones at dal dot ca

The disputed effects of commercial interests on scientific knowledge has enjoyed extensive attention in science studies—especially with regard to such publicly visible, and controversial, areas as conflict of interest in both public policy development and the reporting of scientific research. The epistemological consequences for science of the neo-liberal agenda in some zones, however, may be less obvious but are no less powerful. In bio-industries in particular, profit margins shape priorities and dictate where and how to exercise influence (in terms of resources, monetary and otherwise). Wise investors strategize by hedging their bets across a range of political sites to maximize their return on investment. Attractive sites may be: patient groups, where Pharma funding may deflect critique of high priced, novel treatments whose risk is still unknown; the regulatory approval of therapeutic products, where expert advisors may find ways to undermine precautionary arguments; in manipulation of regulation via commercial advertising which gives the edge to certain products. These all have consequences for how people both 'know' science and are known by science. With the range of topics addressed here, we hope to engage the audience in a discussion of the more subtle, and perhaps insidious, effects of globalized commercial interests on scientific practice and its role in society.

Janice Graham
Dalhousie University

Inside Out: From the Test Tube to the Dinner Table

Scientific expertise plays a pervasive role in the discovery, implementation and safety assessment of the applications of such expertise in our day-to-day world, such as the foods we consume and the medicines we take. It plays this role because of its success at unlocking nature's secrets at the level of the laboratory and clinic - that space "inside the test tube" that enjoys our confidence, but is largely hidden from public view. The uncertainties surrounding the risks of science are identified, assessed, turned into probabilities, and managed when its products are being translated and transformed into therapies, medicines, agricultural and food products. By what pathways does this expertise translate into the processes and products that we all consume, our "dinner tables" so to speak? What do we need to demystify these ritual activities? What do we need to know in order to trust that the final products do what is claimed of them, safely? Who and what are responsible for the safety, efficacy, effectiveness and quality of these products? This paper will use specific examples drawn from the domains of the pharmaceutical and food industries to examine in particular the role played by government oversight of these pathways on behalf of the public they serve.

Sharon Batt
Dalhousie University

Epistemological Partners or Sugar Daddies? The contested legitimacy of Pharma funding and patient advocacy groups

During the past two decades, members of patient advocacy groups (PAGs) have claimed recognition as epistemological experts in scientific knowledge and health policy, based on their experiential understanding of a disease and its treatments. Many PAGs now have formal representation on scientific review panels and participate in formulating health policy while supporting their advocacy with funding from the pharmaceutical industry (Pharma). In this study, I use ethnographic methods to investigate how PAGs understand and negotiate Pharma funding relationships. To some observers, Pharma funding may constitute negative baggage in a PAG's struggle to maintain and strengthen its claims-maker status; to others, a Pharma partnership may signal legitimacy. How do different PAGs navigate the ethical edge of the debates, within and outside their ranks, about industry funding and its potential effect on knowing, truth-telling, and credibility?

Mavis Jones
Dalhousie University

Knowledge Translation of a Different Kind. Taking the social with the technical.

In nations seeking to modernize their governance regimes, a fresh approach has been taken to choosing the appropriate sources of knowledge on which to base policy. This is particularly true in risk regulation, where the applications of scientific knowledge bear both the promise of bettering life and the potential for health or environmental damage. In such cases regulators have sought new precautionary approaches which renegotiate the basis for sound decision-making; where technocratic approaches may have reigned supreme, regulators are now forced to bring more nuanced, subjective, social accounts of potential risks into consideration. While the social and the technical may sometimes be uneasy bedfellows, regulatory experiments of this nature have ranged from the innovative to the predictable, although often with unpredictable results. This paper reviews some of these experiments and their critiques, concluding with the case of a regulatory innovation within Health Canada: The Policy on Public Input into the Review of Health Products. In presenting this case, I will consider not only how new regulatory approaches challenge conventional expert/lay knowledge hierarchies, but also how regulatory institutional culture presents its own 'way of knowing' into the mix. The everyday, rapid decision-making skills of regulators are put to the test when required to adapt to a new knowledge base. What strategies do regulators rely on to help them meet these challenges? What lessons can be learned from this experience and applied to other regulatory questions, and other settings?

Liz Toller
Dalhousie University

Commercial Advertising of Natural Health Products: Do Patents and Trademarks Mean 'Good' Science?

Private investment in the life science sector represents a growing space for new business opportunities. Scientific experts and corporate business players in the natural health product industry form political and financial alliances to translate scientific possibilities into successful business strategies. This paper contours the success of the private in the development and commercialization of "naturally derived, evidence-based, clinically tested, medicines for disease prevention and health maintenance" such as CV Technologies' natural cold remedy COLD-fx®. A critical focus on intellectual property law and natural health product regulations brings to the fore contradictions in the way scientific knowledge is used in commercial advertising. Specifically, this paper finds that a dichotomy exists between patents, trademarks, and what is assumed to be 'good' science. Despite questionable and incomplete evidence supporting scientific claims for herbal cold remedies, legal devices used in CV Technologies' quality assurances and marketing tactics are manipulated through regulation to bolster the scientific credibility of their 'natural' products. The implication of globalized commercial interests in new drug development and innovation provokes questions about the way people know science: How do the priorities of private investors shape and perform the transformation of scientific knowledge into drugs? Does the relationship between the private sector and the regulatory process for natural health products face a slippery slope? And finally, what impact does the relation between science and commerce have on the epistemological practices of science and regulation for emerging health products and technologies?

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3.10 Intimate Interfaces: Constituting Technologies, Bodies, and Users through Seamless Relations

Organizer/chair: April Huff
University of California, San Diego
ahuff at ucsd dot edu

With a focus on technologies intended to seamlessly interface with bodies, this panel will examine the processes by which designs, users, subjectivities, and bodies become mutually constituted. Panelists explore these issues through case studies of prosthetic limbs, sex toys, and brain tomography research on sexual arousal. These studies will contrast numerous ways of knowing body-technology interfaces, such as the embodied experience of the user or the "objective" assumptions of the designer. Collectively these studies suggest the irony that modernist efforts to create seamless interfaces actually contribute to the production of the body-technology divide. Some questions that the panel will address include: What are the implications of presuppositions embedded in technical design for intimate user interfaces? How do designs, bodies, and users become mutually constituted? What characterizes a seamless interface and what assumptions make such interfaces thinkable?
Other technology

Tom Waidzunas
University of California, San Diego

Sexualities Built with Brain Scans: Locating the machine in brain tomography research on sexual arousal

Since 1999, brain tomography has been deployed to establish neuroanatomical correlates of sexual arousal and behavior in men, and later in women. Using visual and tactile forms of stimulation on subjects in conjunction with PET or MRI scans, scientists purport to have found brain centers that underlie sexual functioning. Consequently, researchers believe they have developed a powerful tool for the diagnosis and treatment of sexual abnormality. While previous research on sexuality and the brain has been conducted, brain tomography is praised as an advance over earlier methods seen as too invasive. Brain tomography provides an interface between researcher, technology, and subject that is portrayed as seamless, offering the audience a direct view into the subject's mental state. This paper will locate the machine in these practices, exploring the process of image manufacturing and the rhetoric that makes the machine invisible. Through historically situating this research, and revealing the co-construction of brain tomography testing and various emergent sexual subjectivities, the seamlessness of the interface will be questioned. Rather than providing the new basis for absolute certainty on the etiology and diagnosis of various sexualities, this research is based on traditional methods for the selection and sorting of normal and abnormal subjects. Drawing on assumptions rooted in the biological genesis of sexual desire, this work has reproduced numerous essentialist

notions of sexuality including sex differences with regard to libido, the conflation of gender and sexual orientation, a male heterosexual norm, and the fixed character of deviance.

Cynthia Schairer
University of California, San Diego

The Many Users of an Artificial Limb: Reading a Personal Technology

Though only one individual can wear a customized artificial leg, many people come together to make the technology possible and usable. Behind every prosthesis is a group of doctors, surgeons, prosthetists, physical therapists, nurses and manual laborers. In executing their job of fitting the patient with an appropriate limb, they both enable and constrain the patient's relationship to their new hardware. This paper will consider the design and assembly of the modern modular artificial limb by manufacturer, doctor, and prosthetist and how the decisions of each can open and close possibilities for use by the patient. To what degree are the possibilities and constraints written into the technology itself or the institutional process that furnishes artificial limbs? Are constraints instead generated through ways of knowing or thinking about the limb? How do patients embrace or resist the consequences of professional decisions regarding their limbs?

April Huff
University of California, San Diego

Pleasure by Design: Women's sexuality and sex toys

Since well before the 1970 publication of "The Myth of the Vaginal Orgasm" by Anne Koedt, feminists and sexuality scholars have been arguing against the prevailing ideas and assumptions about female sexual desire and response. These changing ideas about sexuality have certainly affected the design and marketing of sex toys, but to a certain extent the traditional views of women's bodies and desires are still designed into the products. Though the technology is clearly designed to seamlessly interface with the female body, these devices are also designed to perfectly fit with women's desires. This paper will explore how assumptions about female anatomy and sexual desire get built into sex toys. The paper addresses the following questions: What are the regimes of truth about female bodies and sexualities and what are the complicated roles they play in sex toy design and marketing? Are sex toys meant to strictly imitate or to improve upon conventional sex? How are the female users of these toys imagined and configured? To what extent are these assumptions of female sexuality taken up or rejected by the actual users?

Discussant: David Serlin
University of California, San Diego

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3.11 STS in Canada: Building Towards the Future (Roundtable)

Organizer/chair: Patrick Feng
University of Calgary
pfeng at ucalgary dot ca

Building on discussions held in Vancouver in 2006, this lunchtime roundtable will explore ways of developing and strengthening STS networks across Canada. Attendees will have an opportunity to learn about each other's work, discuss recent developments in the field, and work towards forging stronger linkages between STS programs and research groups across the country. This will be an informal event with lots of interactive discussion, so come prepared to talk!
Other technology

END

4.1 Author Meets Critics:

4.2 STS & Information Studies IV: Mapping Science

Organizers: Jean-François Blanchette
Information Studies, University of California, Los Angeles
blanchette at ucla dot edu
Geoffrey Bowker, Santa Clara University <gbowker at scu dot edu>
Loet Leydesdorff, University of Amsterdam <loet at leydesdorff.net>
Chair: Martin Meyer, SPRU, Sussex University M.S.Meyer at sussex.ac.uk

While STS and information science (IS) share a common interest in mapping the dynamics of science and technology (Callon, Law and Rip, 1986), and some common ancestors (e.g., de Solla Price), each field has evolved in relative methodological isolation from each other. This session will address new mapping and visualization techniques developed in IS, with a specific focus on their application in STS. Papers will feature ethnographic approaches (e.g., using co-word analysis in ANT), scientometric approaches (e.g., mapping structures of science and technology through journals and patents analysis), and historiographic approaches (e.g., capturing developments over time using HistCite). Furthermore, the application of these approaches in professional practices (e.g., the management of knowledge-based agencies) will be discussed. The session will thus illustrate some of the disciplinary challenges of doing work at the intersection of these two disciplines, as well as the opportunities afforded by joining STS's rich qualitative tradition, with IS's quantitative research tools.

William Turner, Nicolas Ferey
LIMSI-CNRS

Cognitive conflict maps for managing distributed collective practices : An attempt to use ontology construction to explore the dynamics of collective sense-making

Our research at LIMSI aims at developing a platform for observing how software and human agents interact to produce coherence in computer-mediated environments. Three questions are being addressed.

1. Our research aims at stabilizing the use of Topic Maps for representing scientific domains. Topics then linked together using a set of meta-data, to produce a grid for making sense out of what is going on in the field. How should software/human interactions be configured in order to produce relevant, domain readable semantic grids? We are using a theory-driven knowledge engineering approach to answer this question, which produces a "top-down" categorization of resources in a scientific domain.

2. Sociologists have shown the extent to which heterogeneity can play a positive role in fuelling the dynamics of collective knowledge production and sense making over time. By confronting "bottom-up" results – obtained through language processing algorithms for analyzing document flows in computer-mediated environments – and "top-down" results obtained through the application of Knowledge Engineering techniques, the

collective sense-making process can be stabilized. "Cognitive conflict maps" can be used reflexively as an aid in organizing discussions of collective knowledge production goals and objectives.

3. The evaluation framework shows the extent to which efforts aimed at stabilizing the process of collectively building Topic Map Semantic Grids contribute to enriching the confidence building dynamics underlying the formation of distributed collective practices. In the case study we will report upon an application in genetic engineering.

Stasa Milojevic
Information Studies, UCLA

Do STS and IS Provide Compatible Theories and Methods for the Study of Scientific Disciplines?

The problem of "disciplinarity" has been approached in different ways by both science and technology studies (STS) and information studies (IS). Development of scientific disciplines using quantitative methods was intensively studied by STS between 1960s and 1980s. While these studies concluded that there were no general models of the development of the fields, various models or theories of the development of disciplines and scientific specialties stemming from these studies are still being used. On the other hand, information science, and especially bibliometrics, has persistently focused on the methods, such as citation analysis, to study structure and dynamics of the science as a whole, as well as of the disciplines, specialties and knowledge domains.
A question of enduring interest is whether similar intellectual fields are converging or at least maintain contact, and if so, what is the nature of this contact. To address this topic I conducted content analysis of recent STS and IS literature on the growth of disciplines and scientific specialties in order to gain a perspective on various theories of specialty and disciplinarity development that are currently used, and on methods that are employed to construct and support these models. I looked at the sources of these theories and methods. Finally, I compared and contrasted findings from STS and IS journal literature, in order to see if they follow similar trends or patterns and if the models and methods developed in STS can be applied in IS and vice versa.

Diana Lucio-Arias
School of Communication Research, University of Amsterdam

Building Narratives from the Historical Reconstruction of Scientific Developments: From "Fullerenes" to "Nanotubes"

The exponential growth of scientific publications with the prefix "nano" (Braun et al., 1997, Meyer et al., 1998, Schummer, 2004) since 1997 indicates a new field of research, with its own structures, communities, and dynamics. This field will be reconstructed in terms of its publications using the software package HistCite™. The reconstruction enables us to map the processes of knowledge production and diffusion over time. After the discovery of fullerenes in 1985, the dynamics first led to stabilization of a research

front. This stabilization was reinforced when nanotubes were discovered in 1991. Nanotubes can be considered as a more specific discovery within the field of fullerenes, but they have more technological applications. The historical reconstruction of the two research fronts provides insights in the changes in the structure of scientific communication when a major discovery occurs.

After the discovery of nanotubes, research in fullerenes has gradually lost the characteristics of a research front; the research front is now constituted mainly by research on nanotubes. While scientific knowledge is embedded in scientific publications, these are considered the unit of analysis. However, the new knowledge emerges in terms of relations among these texts and can be represented in networks of citations, words, authors, and their aggregates (e.g., journals). Analysis of these networks at different moments of time demonstrates that the various stages of a scientific development exhibit significant differences in the patterns of communication. Statistics enable us to investigate these visible changes of patterns in terms of codification, diffusion, and critical paths.

Loet Leydesdorff
University of Amsterdam

Mapping the Knowledge Structures in Patents using Co-classifications

Patents have been studied in evolutionary economics as input indicators for the measurement of innovativeness of firms and regions. From the perspective of the knowledge production system, patents can be considered as output indicators. While in the scientific domain aggregated citations among journals have been used to indicate cognitive structures, patent citations reflect primarily economic value and intellectual property. However, patents are codified in terms of classifications which are attributed by the patent examiners.

In this study, I explore the options to use co-classifications as an alternative means to map the content of the patent system. The USA, the EU, Japan, and other countries use different rules for the application and different classification schemes. The World Intellectual Property Organization (WIPO) has developed an international classification scheme which is not biased regionally and maintains a database of patents with international designations (insofar as the patents are filed under Patent Cooperation Treaty which is currently undersigned by 135 nations). Using the 138,751 patents published by the WIPO in 2006, national profiles can be constructed in terms of co-classification maps. The files for the visualizations will be brought online in the Pajek format so that users can choose their specific visualization techniques. This technique can also be used for studying the patent portfolios of individual corporations, but from the perspective of STS one can expect the inventors (and not the applicants) to be the interesting agents.

Diana Rhoten
Office of Cyberinfrastructure, NSF

Understanding interdisciplinary research and training: A picture is worth a 1,000 words

The Integrative Graduate Education Research and Training program was initiated by the National Science Foundation in 1997 to "catalyze a cultural change in graduate education for students, faculty and institutions by establishing innovative new models for graduate education and training in a fertile environment for collaborative research that transcends traditional disciplinary boundaries." With almost 10 years of program investment behind it, faculty, administrators, and policymakers want to know: Do IGERT-trained students collaborate, integrate, and innovate differently?

As part of a three-year study aimed at answering this question, this discussion presents preliminary results from the study's social network and interview analysis of a subsample of 13 IGERT projects. By combining these techniques, this portion of the study (1) produces a series of sociograms that depict the individual attributes and interrelational structures that define the research and training networks of these IGERTs, (2) explores the dynamics that both shape and are shaped by these structures, and (3) maps the interactional "hot spots" significant to understanding how, when, and where scientific collaboration, production, and innovation occurs.

This aspect of the study yields generalizable criteria for classifying interdisciplinary research and training networks as well as detailed exposure into how the individual and the organizational, the social and the psychological factors of these networks are played out in action and displayed in pictures. Together, these provide critical first steps toward understanding interdisciplinary research and training. This discussion will focus on how future work of this type would benefit from further integration between STS and IS.

Alberto Cambrosio (McGill): discussant

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4.3 Law and the Question of Non-science: Legal Encounters With 'Other' Ways of Knowing

Organizer/chair:
Manjari Mahajan
Cornell University
mm375 at cornell dot edu

The institution of law is often called upon to adjudicate between scientific knowledge and 'other' ways of knowing. Law has to contend with claims made by modern science and by what are deemed non-scientific, traditional or non-empirical systems. Religious teachings about evolution, tenets of traditional medicine, lay and non-technical experiences regularly jostle for authority and legitimacy against claims made by scientific experts.

This panel will explore how different legal systems in Europe, North America and Asia have handled 'other' ways of knowing, especially when these perspectives have conflicted with mainstream scientific propositions. What forms of reasoning, styles of language and standards of evidence have legal systems adopted to evaluate different epistemic frameworks? The papers in this panel, notwithstanding their varied case studies, are unified by their common concern with the deployment of law under conditions where there is a complex contestation between ways of knowing.

Michael Lynch
Cornell University

Popper's Problem in US Law: The Career of the Science Question in Court

In Conjectures and Refutations, Karl Popper states that from an early age he was preoccupied with the philosophical problem of "… distinguishing between a genuinely empirical method and a non-empirical or even pseudo-empirical method – that is to say, a method which, although it appeals to observation and experiment, nevertheless does not come up to scientific standards." Popper's solution to that problem – falsifiability – failed to command universal assent in philosophy, not to speak of STS where it is almost universally rejected, but Popper's problem and to some extent his solution, has had a prominent place in US law. This paper discusses two very different lines of cases in which the question of how to distinguish science from pseudo-science has had a prominent, and much discussed, place: Federal rulings on legislation that would place creation science and/or intelligent design in public school curricula, and challenges to the admissibility of expert evidence. The way courts have handled these cases has been criticized by prominent philosophers of science, but the criticisms rarely address something that STS scholars should know very well: that even if, contrary to the objections made by Popper's nemesis Wittgenstein, we allow that there can be philosophical problems, we need to address the difference between Popper's problem,

and the similarly worded, but differently situated, concerns of the court. The paper will argue that in both lines of cases judicial decisions have shunted Popper's problem on to a sidetrack where it belongs, and resolved the disputes on other grounds.

Manjari Mahajan
Cornell University

Of Doctors and Sangomas: The Politics of Healing in South Africa

In 2004, South Africa passed a law that recognized traditional healers, or sangomas, as legitimate health practitioners. Through this law, the state sought to regulate the practice and practitioners of traditional medicine in much the same way as the state regulates doctors that follow a western biomedical paradigm. The traditional health practitioners' law was passed to acclaim from the predominantly black parliamentarians, who applauded the official recognition of traditional medicine, which is the dominant form of health care for much of South Africa's population.

Granting traditional medicine an equivalent legal status to the western biomedical system, however, led to a variety of tensions and contradictions. For instance, insurance companies had to navigate between differing claims made by doctors and traditional healers. Employers had to come up with new policies to accommodate employees' sick leave claims that were made on the basis of intimations from traditional healers. Perhaps the tensions were most volatile in the terrain of the AIDS epidemic where sangomas regularly claimed that antiretroviral drugs were toxic, and doctors in turn announced that traditional remedies were often dangerous.

This paper will examine how the contradictions between the epistemic practices of traditional medicine and biomedical science were navigated in South Africa's legal system. It will investigate how the courts and regulators attempted to translate concepts of treatment and illness from one knowledge system to another.

Barbara Prainsack
University of Vienna

DNA behind bars: "Other" ways of knowing forensic DNA evidence

Whereas forensic DNA evidence has received considerable attention from STS scholars and social scientists in recent decades, research has mainly focused on knowledges and practices of those who analyze, process, categorize, and authoritatively interpret DNA evidence (criminal investigators, lawyers, forensic scientists, etc). The perspectives of those who leave traces, on the other hand, have not been in the center of attention.

This paper explores "other" ways of knowing DNA in the field of criminal investigation. Drawing upon in-depth interviews with prisoners in Austria, it explores how this group knows and conceptualizes DNA traces and forensic DNA profiling. One of the findings is that the highly scientific character which our respondents attributed to DNA profiling had an intimidating and silencing effect on them. Whereas scientists and criminal investigators were very much aware that DNA evidence at a crime scene does not "prove" a person´s active involvement in a crime, suspects/convicts often assess the truthfulness of DNA evidence differently. In addition, voicing support for DNA profiling for crime investigation seemed to serve as a demonstration of one´s potential for resocialization. Such "other" ways of knowing forensic DNA evidence prevalent among a highly stigmatized group shed light on the multitude of ways in which prisoners govern themselves by internalizing the truths of authorities. However, they also show how - in contrast to the medical field, where scientists still see the knowledge "deficit" of "the public" as a problem – criminal investigators and the legal system make productive use of the discrepancies between "scientific" and "non-scientific" knowledge for their own objectives.

Javier Lezaun
Amherst College

Demarcations of Science and the Limits of Eloquence

The cross-examination of witnesses in legal cases involving the demarcation of science from pseudoscience often generates peculiar formulations of the inability (or unwillingness) to respond, going back to William Jennings Bryan's famous "I do not think about the things I don't think about," uttered in the Scopes trial in response to Clarence Darrow's challenge to the scientific validity of the Book of Genesis. Similar testimonial responses appear when courts interrogate witnesses in an attempt to determine whether their beliefs should be considered proper religion (and thus protected by Constitutional guarantees of free exercise) or mere idiosyncratic preferences. This paper will analyze the structure of some of these exchanges and the nature of these limits to articulation, drawing examples from court cases on the scientific nature of creationist beliefs, and from trials involving the delimitation of authentic religion. It will then compare these utterances with similar forms of rebuttal elicited by social scientists when questioning the unwillingness of individuals to engage in other scientifically-mediated articulations (as in the refusal to undergo genetic diagnosis, or seek medical treatment).

Marie-Andrée Jacob
Keele University School of Law

Double Match: Evidence Making under Israeli Tranplant Law

There is a thriving tension in kidney transplants between the language of biomedicine and that of social interactions. For example, the jargon of transplant medicine speaks of

disassembling and reassembling people and their parts in terms of biological matching and compatability, as if people either fit or do not fit. In contrast, there exist complicated codes of interaction that people follow when they make alliances, ask and offer things, especially in intimate settings, but also in the market. These social interactions are at the center of legal, investigative, and interdisciplinary knowledge performances in transplant units. In Israel, living kidney transplants get legitimized through an array of committees concerned with adjudicating hte presence or absence of evidence of altruistic motives. One critical aspect of these legitimating activities is the idea that evidence of altruistic motivations is to be decipherable and revealed by expert knowledge. In fact, expert and amateur interpretations of psychology, Talmudic knowledge, judiciability, and class are key criteria to recognize evidentiary presence of an altruistic transplant. On the basis of interviews and ethnographic observations among professionals involved in these committees, I detail some of thse knowledge-making debates and ask what this tells us about the relationships between legal and medical and other ways of knowing more generally. I argue that law, expertise, and amateurism are held in a relation to the context of transplants that is different than what we ordinarily conceive of it.

The abstract for Paper 5: "Match-making stories: law, medicine and creativity around living transplants in Israel" was not ready at the time of submission, but will be sent to the 4S organizers in a few days.

David Mercer (Wollongong)

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'Quality Control, Folk Epistemology and the Iron Cage'
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> This paper will comment  on the important political, historical and
> epistemic similarities between  'social problem discourses'
> preoccupied with managing the  '"quality"  of science  in  law,
> medicine  and regulation which began exerting a significant influence
> on  policy during the the 1990's.  It will specifically  draw
> comparisons between the debates surrounding  the 'Daubert' reforms to
> the admissibility of expert evidence and the rise of 'Evidence Based
> Medicine'. A  feature of these reform movements  have been  overt and
> detailed 'public' discussions of  epistemological questions: What is
> science ? What is Evidence?  Questions more traditionally 'back
> staged'  in policy settings.  Where  has  debate surrounding these
> questions  lead? By promoting images that methodological propriety
> is a more significant attribute of reliable expertise than trust  or
> experience,  there has been a potential to destabilize the
> traditional  professional identities of many experts working in
> legal, medical and regulatory settings.  Rather than lead to greater
> public involvement in scientific decision making or public
> accountability of experts, heightened concerns with the 'legitimacy
> deficit' of the individual expert, would appear to have merely
> enhanced the power of  bureaucracies  with the capacity to absorb
> epistemological challenges  into routine procedures and
> administrative practices.
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END

4.4 Knowledge Gaps and STS

Organizer/chair: Scott Frickel
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Recent efforts to theorize knowledge nonproduction have focused mainly on areas of research that remain highly underdeveloped despite their potential for producing innovations that correspond to pressing societal needs and despite sustained efforts by social movement actors to draw attention to those needs. But not all knowledge gaps attract political contestation (most surely do not). Papers in this panel explore the nature of knowledge gaps and the processes through they are produced and institutionalized as both intentional outcomes of knowledge politics and unintended consequences of normative cultural practice.

Jody A. Roberts
Chemical Heritage Foundation

Chemicals out of place

We have come to accept that we live in a synthetic world – one now literally constructed from the thousands of human-made chemicals produced each year around the world. As a correlated consequence, we have come to accept the presence of these chemicals—and the artifacts of their construction and destruction—in our environment. The immense machinery composed of analytical equipment, dispersed monitoring methods, regulatory standards, field and laboratory technicians, clearly mark our tacit acceptance of synthetic chemicals in the world. But what happens when this same machinery is brought to bear on us in order to elucidate the place of synthetic chemicals in our bodies? As a result of the increasing use of human biomonitoring studies—i.e., the monitoring of human bodies through the analysis of blood and urine samples, for example—we are presented with a new situation. Synthetic chemicals may no longer be out there, but also in here. Human biomonitoring creates a new sense of danger and also a new set of politics. Who is tested, what is tested for, and how the information is released to both those tested as well as the general public continue to be contested topics with different models employed by the various groups sponsoring these studies. In this paper, then, I will offer some comments on the ways in which information collection and dissemination have become contested spaces, and how calls for further research (across disciplines and communities) highlights the tensions between the done, yet to be done, and perhaps permanently and purposefully undone.

Maria Powell
University of Wisconsin-Madison

No monitoring, no exposure data…no health risks? The Shaping of Exposure Data Gaps in Nanotechnology Workplaces

As nanotechnology development skyrockets, government agencies, scientists, and NGOs worldwide are raising concerns about potential risks to workers in nanotechnology facilities. Millions of workers in research labs and industries worldwide produce and/or handle engineered nanomaterials on a regular basis. Although some engineered nanomaterials have been in mass production since the 1990s, and numerous risk reports have stressed the need for monitoring in nanotechnology production facilities and labs, there is little to no data on levels of workplace exposures to engineered nanomaterials. These data gaps make it very difficult to characterize workplace risks and develop adequate health and safety controls order to prevent potential health problems. Using in-depth interviews with scientists, government agency staff, and workers in nanotechnology facilities, along with analysis of risk reports and government documents, this project explores some of the regulatory, scientific, communication, cultural, and perceptual factors that shape knowledge and data gaps related to occupational exposures to nanomaterials.

Sarah Kaufman
New York University

Violent Knowledge: Reintroducing Expertise into American Criminal Justice

For the majority of the twentieth century, the criminal justice system in the United States was based on the idea that violent criminals could be rehabilitated through the applied use of expert knowledge: felons were to be kept under the supervision of the state until social

workers, psychologists, psychiatrists, and other professionals determined that they had been successfully rehabilitated. Today, the criminal justice system no longer claims to rehabilitate violent offenders and puts few resources into the deployment of expert

knowledge; since the mid-1970's it has increasingly focused on retribution and the control of dangerous populations. This model is becoming increasingly untenable however, as the growth of the prison population strains state and federal resources and violent crime rates remain high. In this project, I argue that the lack of expert

knowledge in the criminal justice system is an understudied cause of the cycle of violence, incarceration, and recidivism. Drawing on findings from an on-going ethnographic study of capital sentencing, I present a model of how expert knowledge can focus criminal sentencing on the social, rather than individual, causes of violent behavior. Only by reintroducing and refocusing expertise in this way can we hope to interrupt the cycle of violence, incarceration, and recidivism.

Barbara Allen
Virginia Tech

Incomplete by Design: A Comparative Socio-Legal Lens on Making Environmental Health Knowledge in Italian and U.S. Chemical Regions

The petrochemical regions of Porto Marghera, Italy and south Louisiana are similar, technologically in that they: 1) are large producers of chlorine-based chemicals, 2) exist within employment-starved regional economies, 3) saw tremendous growth after WWII, and 4) are located adjacent to important aquatic resources and fragile wetlands. In 2002 and 2004, environmental health legal cases were decided in Louisiana and Italy, respectively, with decidedly different outcomes. These cases illuminate national and cultural differences in the creation and dissemination of scientific knowledge and point to policy possibilities that could be a catalyst for positive change.

Joanna Kempner
Princeton University
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The Chilling Effect: Politics and the (Non)Production of Knowledge

In recent years, the NIH has been the target of powerful political operatives (in Congress and in interest groups) who disagree with specific funding decisions made via peer-review and, more generally, argue that "scientific autonomy" is undemocratic and elitist. Pro-science advocates argue that such oversight has introduced ideology into scientific decision-making and created a "chilling effect," causing scientists to self-censorship in anticipation of penalization. Such claims are difficult to assess, as social scientists know very little about the mechanisms by which such suppression might occur. This paper provides an exploratory assessment of the contours and mechanisms that constitute widespread suppression in science, by tracing the repercussions of a single political controversy on the production of NIH-funded research.

The controversy in question occurred in 2003, when Republican congressmen and a conservative religious organization attempted and failed to force the NIH to withdraw funding from more than 200 projects that investigate sexuality and other "risky" behaviors. In this paper, I present survey (n=82) and in-depth interview data (n=30) with researchers targeted in this controversy, in which they were asked to reflect on how these events altered their research practices. Researchers discussed a number of ways in which this controversy shaped their decisions not to pursue certain research, including their choices to disguise, reframe or self-censor potentially controversial research questions or findings. I conclude that public controversies are an important agent in the nonproduction of knowledge.

 END

4.5 Exploring the Nano-Enterprise

Organizer/chair: Patrick McCray
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Barbara Herr Harthorn (co-chair)
UCSB
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A recent review in *Nature*, for example, labeled nanotechnology as a "subject with an existential crisis." As a vast, sprawling multi-disciplinary endeavor what holds it together? Is it simply materials science in a new package or, as cynics suggest, a way to secure funding? Or is the central theme of nanotechnology sociological rather than scientific? Understanding nanotechnology less as a revolutionary break with the past and instead as an effort to develop technological solutions to social and economic problems will depend on understanding it at multiple levels of analysis – research fields, instrumentation, individual contributions, national science policy, and an example of "techno-futurist" movements. This suite of topics and issues is what we broadly refer to as the 'nano-enterprise.'

Near-term challenges to the nano-enterprise include uncertainty that place new burdens on the patience of capital markets, the role of the intellectual property system, and issues of globalization. At the same time, nanoscale research has already precipitated major questions of public policy, risk, and societal perceptions of emerging technologies. Finally, addressing all of these concerns is dependent on rigorous historical analysis for anticipating future societal and ethical implications of nanotechnology will rest on a coherent understanding of its origins and current contexts. This panel draws upon the last two years of research carried out by scholars associated with the Center for Nanotechnology in Society at UCSB. It presents a diverse array of methodological and disciplinary approaches to studying 'nano and society' and, in doing so, offers a necessary perspective on the current state of and future directions for the nano-enterprise. Nanotechnology

Mary Ingram-Waters and W. Patrick McCray
UCSB

From Space Colonies to Nanobots: Exploring a Hidden History of Nanotech

This paper follows the 1970s pro-space movement as it evolved into today's nano-advocacy groups. Not only do the two movements share traditional features of social movement spillover, including shared ideologies, resources, and memberships, but they also share specific individuals, including Eric Drexler, Christine Peterson, Hans Moravec, and many others. These individuals, or network entrepreneurs, represent important linkages over time between technologies of space exploration and nanoscience. Through

analysis of historical documents and interviews with these network entrepreneurs, we trace one of nano's alternate or "hidden" histories.

Christopher J. Newfield
UCSB

Next Generation of Technology Transfer: Current Policy Limitations for Nanoscale Research

This talk reports on the Center for Nanotechnology in Society (UCSB)'s recent research on technology transfer policies for nanoscale research. Our starting questions have been, first, whether nanoscale research is perceived to be distinctive and to raise unique licensing issues, and secondly, whether the current structure of technology transfer policies needs to be changed. The latter have developed in the "Bayh-Dole Framework" - the federal legislation that has shaped technology transfer development for the last 25 years, and our research was guided by two initial hypotheses: 1) the highly interdisciplinary and collaborative nature of nanoscale research would cause tensions with the individualistic understanding of intellectual property in universities; and 2) that the accelerated expectations for a financial and product-based payout would encourage early licensing, aggravating the problem of "patent thickets." To address these questions, we are interviewing a number of technology managers and principal investigators involved with nanoscale research, and propose to make an early report of our findings at this meeting.

Richard Appelbaum
UCSB

China's Bid to Become a Global Leader in Nanotechnology

China's explosive economic growth over the last two decades is popularly associated with millions of low-wage factories producing clothing, electronics, and other consumer goods that line the shelves of global retailers such as Wal-Mart and Carrefour. This standard "low road" to development, in which export-oriented industrialization fuels eventual movement up the value chain, masks a much more significant trend in the simultaneous rise of China as a global economic power: its push to become a technology powerhouse through large sums of public investment in basic and scientific applied research and development. This push is especially important in light of the view shared by Chinese economists, planners, and policy-makers that China is now at a tipping point: still overly dependent on foreign multinationals for scientific innovation, manufacturing technology, export earnings, and double-digit economic growth, yet poised to develop its own indigenous knowledge base and industrial capability. The Chinese government calls for "leapfrogging development," becoming the first modern economy built on both low-cost exports and high-tech breakthroughs, with revenues generated from the former paying for the latter. In this paper we examine China's bid to become a global leader in nanotechnology, moving from basic research to the development of nano-enabled

commercially-viable products. We provide evidence in support of the hypothesis that Chinese nanotechnology is experiencing rapid advances for two principal reasons: a high level of international collaboration, particularly (although far from exclusively) with expatriate Chinese living in Europe, North America, and Japan; and targeted governmental spending on nano-related research, development, and commercialization. While China is not yet a global nanotechnology leader, its intentions are clear – and its trajectory is promising.

Timothy Lenoir and Eric Gianella
Duke University

Technology Platforms in the Landscape of Contemporary Science

In the economics and management science literature a technology platform is a foundational core technology which is a set of subsystems and interfaces that form a common structure from which a stream of derivative products can be efficiently developed and produced. Cambrosio and Keating have effectively developed a more extended notion of biomedical platforms in analyzing contemporary biomedicine. While we work with a more restrictive notion of platform than the large-scale sociotechnical systems described by Cambrosio and Keating, we argue that the notion of a technology platform is particularly pertinent to analyzing emerging new domains, such as bionanotechnology, where the dynamics of the field arise from transdisciplinary convergences drawing upon different research streams and a heterogeneous mix of tools and concepts rather than evolving out of a single theoretical or technical core. In this paper we will discuss the utility of tracking the formation of technology platforms in understanding the landscape of contemporary science drawing upon tools we have developed for tracking, mapping, and visualizing the formation of technology platforms and the research groups involved in developing them in several areas of contemporary biomedicine.

Terre Satterfield, Barbara Herr Harthorn, and Milind Kandlikar
University of British Columbia; UCSB, and University of British Columbia

Research and Development in an Age of Upstreaming

In the contemporary period, it is difficult to imagine a more changed science-social landscape than that posed by nanotechnologies. The coterminous events of an emerging set of technologies and an era of upstreaming in which they are expected to be understood and governed marks an unusual departure from the past. However, little is as yet known of just what scientists, engineers, and regulators make of this confluence of knowledge and expectations and its implications for science, society and development more broadly. This paper explores scientists' perspectives on funding, conducting, communicating, and reflecting on their work in this key historical moment. Interviews across experts explore their knowledge of upstreaming; their concerns and support for escalating public 'intervention' including its effect on funding and demands on the scientific community more broadly; their perceptions of different public and NGO groups; their working definitions of risk communication; the complications that accompany 'engaging the public often and early. Thereafter we explore some early expectations of both the risks and benefits of nanotechnologies and their consequences for ongoing or anticipating later phases of research. Ultimately, how experts regard the upstreaming process and its impacts will have profound effects on the possibilities for both two-way communication between experts and publics and realizing transparency, a crucial factor in effective risk communication.

Tee Rogers-Hayden and Karl Bryant
Cardiff University, UCSB

Deliberating Nanotechnology Risks: UK and US Perspectives

Attempting to move beyond reactive risk debates on established technologies to conduct public and stakeholder dialogue on novel technologies as they are emerging (before established public discourses and before R&D decisions are locked in) is the theory behind 'upstream engagement'.

Such an approach presents a range of methodological challenges: particularly on how to go about such engagement while sharing information with people. There may also be cross-cultural considerations which shape the nature of such dialogue. In this paper we present preliminary findings from a UK-US comparative study which engages with these issues.

We report preliminary comparative findings from four extended deliberative workshops, focusing on potential roles for nanotechnology in energy futures and health and enhancement respectively. Groups were convened in the UK and US, through Cardiff University and the University of California at Santa Barbara as part of an integrated working group project of the Center for Nanotechnology in Society at the University of California, Santa Barbara. We report how people conceptualize nanotechnologies, including their potential risks and benefits, while learning about the technologies in these fields. Implications for the theory and practice of upstream engagement are discussed.

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4.6 Twice Alive? The Re-birth of the Gene in Science Studies

Organizer/chair: José López
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Given the unprecedented epistemological and theoretical challenges brought by the accelerated post-genomic geneticization of society, it is as if the Gene has been reborn in science studies. This panel is concerned with exploring the range of discursive modalities available for the movement of ideas about genetics and genomics through distinct social spaces and temporalities. The point of departure is the realization that genetics/genomics knowledge is compatible with, or even constituted by, a number of sometimes unlikely – and often divergent – epistemic vehicles. The challenge for science studies scholars then becomes one of identifying specific instantiations and reflecting upon their heterogeneity as nodes of intersection and of materialization. In this panel, three papers explore examples of socio-political and communicative processes whereby geneticized discourses materialize at a juncture where the institutional matrices from which they originate are simultaneously transformative and transformed such that they increasingly affect all our lives.

José López
Department of Sociology and Anthropology, University of Ottawa

Making music and making sense out of the genome

In this paper I seek to contribute to the growing body of work that has highlighted the need to develop a theoretical framework capable of exploring metaphorical communication as a social rather than just as a cognitive process. I draw attention to some of the social dynamics through which the inherent polyvalence of metaphors becomes stabilised, though never entirely neutralized. These are used to analyse the deployment of a musical metaphor — nucleotide-bases-as-musical-notes that produce the "music of life" — in the context of travelling science exhibition, The Geee! In the Genome, whose stated goal is to educate and stimulate debate amongst the Canadian public.

I do not argue against the notion that metaphors can be used as ideological tools. Instead, I try to shift attention to the ways in which context, practices, and space serve to close down potential meanings. In the context of The Geee! In the Genome, I argue that although the musical metaphor lacks heuristic utility as a tool for explaining the "science" in this particular instantiation, it contributes to the staging of genomics and "life" itself as a spectacle that serves to frame contentious issues around genetic determinism, biotechnology enabled health care, enhancement, commodification, and property rights in a more hospitable semantic terrain.

Shelley Z. Reuteur
Department of Sociology and Anthropology, Concordia University

'Alien London': British Blood, Jewish Immigration, and Tay-Sachs Disease, 1881-1945

As part of a larger comparative project in the historical sociology of genetics, this paper examines the early history of Tay-Sachs disease (TSD) in the British context. Previous work on the early history of TSD in the US has demonstrated that the discourse of this disease was inextricable from a widespread, eugenicist attitude of anti-immigrationism directed against Jews. In contrast, the UK of this period is often characterised as not being especially concerned with any local 'race problem' but rather that perceived to be developing in its colonies. Drawing on medical journal articles and newspaper reports on Jewish immigration from the period between 1881 (when the symptoms of Tay-Sachs were first observed) and 1945 (the end of the second World War), the discourse of this disease is explored with a view to understanding the relationship between medical racialism, developing knowledge of genetics, and British immigration policy at this time.

Katja Neves-Graca
Department of Sociology and Anthropology, Concordia University

Re-flecting the gene: the social sciences and systems biology in a post-genomic era

The mapping of the human genome brought with it increased scientific and public awareness of the fallacies of lineal causal thinking in genetics. We now know that contrary to biology's former tenet, one gene does not correspond to any single specific function: if fact, the relation between gene and function seems to be contingent upon context, meaning, and process. While all 'scientific fields' remain highly heterogeneous - marked by many conflicting views and discourses - within some scientific fields (e.g. systems biology) there is a growing agreement that 'genes' are best understood and explained through notions of indeterminacy, reflexivity, and interpretation. Hence, it would seem that the time is right to deepen productive dialogues between the social sciences and systems biology in reaction to 'geneticized' politics and economics. This paper explores these issues by considering the theoretical and epistemological shifts that would have to occur in order for truly productive cross-disciplinary alliances to develop in this context. In so doing, the paper also shows that such alliances are inherently political, requiring that our positioning as critical analysts follow extreme care.

William John Leeming
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The Presumed Singularity of Genetics as Science, Medical Innovation, and the Unintended Consequences of the New Genetic Technologies

It is impossible to discuss the future of medicine without referring to advancements in genetics. The new genetic technologies have shown great promise in testing, or applying,

certain technical processes having to do with the transfer of genetic materials. Their promise is nonetheless, as Helga Nowotny has put forward, only "partially recognizable," filling a void at the intersection of changes in meaning in medical innovation. Genetic technologies are also, as Lassen and Jamison have suggested, "solutions in search of problems." In this paper I first examine the quest for innovation in genetic technology and explore some of the reasons why it has achieved such prominence and seeming urgency. I will argue that the concept of innovation in this context seeks to negotiate a future that has become more inherently uncertain. I then compare the use of this concept (i.e., innovation) with an historical precedent, the rise of "medical genetics," and identify a void that is foreseen as being filled by a "genetics-based approach" to medicine. I then return to analyze three scenarios by way of a discussion about the difficulties of matching technological and epistemological opportunities with clinical needs and organizational practices: "geneticization" and "genetic fundamentalism;" increasing awareness about the "genetics-based approach" to medicine via specialization; growing inter- or transdisciplinary convergence of "postgenomics" bringing notions of mutual dependency and networked innovation to bear on commonly defined problems in medicine.

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4.7 Social and Technical Aspects of Scientific Collaborations

Organizer: John Parker
Arizona State University
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Chair Ed Hackett
National Science Foundation/Arizona State

 The past decade has witnessed an increased interest in the topic of scientific collaboration from many quarters within science studies (Sonnenwald, 2007; Hackett, 2005; Shrum, 2005; Walsh, 2003). STS has grappled with issues relating to the collective production of scientific knowledge since at least the pioneering laboratory studies of the early to mid 1970s, but has typically used a wide variety of theoretical and conceptual lens to understand and frame these processes. The development of an integrated literature on the general topic of collaboration has created the possibility of bringing together the findings and insights from formerly disparate areas of science studies into a common synthetic framework. This session will bring together researchers studying a wide range of scientific collaborations with the aims of :1) delineating some of the basic social and technical processes common to such enterprises, and 2) discerning those processes which are specific to particular forms of collaboration. Such an assessment will help determine the utility of using scientific collaboration as a common framework for understanding collective knowledge production. To meet these goals the session will include analyses of a broad sampling of collaborative types, including analyses of organizational forms of scientific collaboration in ecology, amateur scientists collaborating in the production of alternative fuels, and multi-institutional collaborations in the areas of high energy physics, space science, and geophysics (among other fields).

Wesley Shrum, Joel Genuth, Ivan Chompalov
Lousiana State University, American Institute of Physics, Edinboro University of Pennsylvania

Myths of Collaboration

Collaboration is inherent to the scientific enterprise, but the size and scope of modern scientific collaborations has rendered them a new 'object' of study for STS. Our comparative study, which began in 1989 under the late Joan Warnow-Blewett, examines multi-institutional scientific collaborations in high energy physics, space science, geophysics, and other fields, yielding findings that that confirm some widely held beliefs, but contradict others. In this presentation, we focus on the broad conclusions of the study, and offer suggestions for future work.

David B. Conz
Arizona State University

Online Amateur Technoscientific Collaboration and its Effects: Epistolary Science Redux, Social Movement, or Business?

While attempts to displace the 'deficit model' of public understanding and engagement have led to more sophisticated ways of studying the roles of various 'publics' in scientific and technological decisions and knowledge creation, relatively little attention has been given to the role of online discussion forums in enabling new forms of collaboration among amateurs who embrace technoscience through tinkering and bricolage. This study identifies these new types of collaboration in terms of how they simultaneously resemble institutional technoscience, business, and social movements by examining the roles of credit and reputation, knowledge production, and issue framing in online discussion forums.

John N. Parker
Arizona State University

Hot Spots and Hot Moments in Scientific Collaborations

While studies of scientific collaborations often focus on factors related to overall productivity, almost no attention has been given to how this productivity is distributed over the course of a given collaboration. This paper addresses this issue, arguing that there are particular places ('hot spots') and times ('hot moments') during the life course of a scientific collaboration where productivity is exceptionally high. It further argues that the disproportional productivity experienced in these places and times is the result of an unequal distribution of the collaborative resources (e.g. trust, emotional energy, collaborative flow) which foster the collective production of scientific knowledge. Using both quantitative (network analysis, bibliometric analysis) and qualitative (participant observation, in-depth interviews, photography) methods, the talk 1) documents the existence of hot spots and hot moments in two forms of collaboration in the field of ecosystems ecology, 2) analyzes the underlying social processes by which hot spots and hot moments are formed, and 3) discusses the policy implications of these findings.

Hsin-i Huang
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A Study of Networked Scientific Collaboration: The Impacts of CMC, Social Network on Information Sharing and Productivity

The widespread adoption of computer-mediated-communication (CMC) has facilitated the increase of scientific collaborative researches. Wellman (2000) suggested that email and information communication technology allowed spatially disperse intellectually kindred scholars to communicate and collaborate. As scholars and scholarly networks exchange information, collaborate and socialize, these computer networks turns to be the mirror of their social networks. We wondered how scholars interact with each other by

using CMC and will this new collaborative structure break the boundaries between disciplines or flatten the academia hierarchy? The first objective of this study is to explore a government-lead, technical steering committee—the IPv6 research collaboration team, its collaborative pattern of research alliances and the role of ICTs plays in the collaboration. Does the use of CMC enhance collaboration, transform team network structure, and thus facilitate academic productivity? Also, based on the debate of advantages of strong versus weak tie on information exchange, our second objective of this paper is to examine whether the bonding of dense network and strong tie enhances information exchanges and increase productivity, or it is structural hole and weak tie that bridges the network and enrich individual performance? Moreover, under what kinds of network structure and ties can the routine, professional, and private information are exchanged among team members?

A web-based, ego-centric network survey is conducted among 42 IPv6 collaboration team members. A citation analysis and Ucinet software is employed to delineate the network of co-author publication among the IPv6 team members. Our result is the usage of email facilitates communication among team members; it enhances weak ties and has positive effect on publication productivity. Nevertheless, the use of CMC does not increase heterogeneous collaboration across institutions. However, members in each

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Collaborators or research sites? Modes of STS/natural science collaborations

This paper presents the story of an interdisciplinary collaboration, which is used to explore questions of the assumptions and expectations underlying collaboration, the dynamics of the collaborative relationship and changes over time. It is about a collaboration informally arranged between individual scientists as a means of exploring issues surrounding patient/ healthy volunteer involvement in research. Our aim was to test the feasibility and usefulness of involving research subjects more actively in research on a new health technology, to see if this might influence research outcomes, guide practice, and add value to the research subjects' experience. The collaboration brought together three parties (medical physicists, sociologists of science and patient-volunteers) from different backgrounds (or 'ways of knowing'), with differing goals and probably differing understandings of 'research' and 'collaboration'. In this account we focus particularly on the evolution of the practice and understanding of collaboration between the physicists and social scientists.

The collaboration started at the time when the medical physicists were just about to embark on the first clinical trials of a new imaging system using optical wavelengths (rather than x-rays or ultrasound) that had potential for the diagnosis of cancer of the breast. The physicists responded positively to a suggestion that there might be mutual benefits if STS researchers interviewed the volunteer research subjects about their

experience, and systematically fed back to the research team information from the volunteers' accounts which could be useful in further developing the prototype instrument and the test protocol.   It would also be an opportunity to address broader questions about what the experience of taking part in research meant to the volunteers. The details of the collaboration could be worked out as we went along.
As the study progressed and evolved, however, questions about the na

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4.8 Knowing with Computers: How Software and Systems Encapsulate Expertise

Organizer/chair: Thomas Haigh
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These papers use the lens of practice to examine one of the key concepts in computer science: the abstraction and encapsulation of complexity. Any modern computer system consists of dozens of layers of abstraction, with each level of software hiding its actual workings from those above it. This has profound implications for the ways of knowing available to the users of computer systems. Even programmers and system designers interact not with the computer itself but with virtual machines and application programming interfaces. Social assumptions, specialist expertise, and epistemological constructs are embedded within these virtual machines. Haigh and November both examine attempts to embed specialist mathematical knowledge in reusable software routines, intended to make mathematical techniques more accessible to users without the knowledge to understand their inner workings. McMillan explores efforts during the 1960s to create programming languages better able to support this kind of abstraction and code reuse, tying this approach to the rise of computer science with its focus on mathematical logic. Jesiek examines the origins of "embedded systems" (as the specialized computers built into cars, DVD players, etc are known), looking at their blurring of hardware and software design, hiding from the user not only knowledge of the computer's workings but even awareness that they are dealing with a computer. Kita considers the power of user interfaces to encapsulate revolutionary technology within a familiar package, using an early Japanese airline reservation system as an example.

Joseph November
University of South Carolina

Computers and the Unintended Demathematization of Biology

In 1960, when the directors of the National Institutes of Health (NIH) began to commit major resources to the introduction of computers to biology and medicine, they regarded the computer as the means to mathematize the life sciences. To the NIH's vast disappointment, it was clear by the late 1960s that the presence of computers was having the opposite effect in laboratories and hospitals: rather than enabling biomedical researchers to become more rigorously mathematical, computers were allowing them to black-box many of the mathematical components of their work. To illustrate how this ironic development came to pass, I will examine two areas: 1) the goals and constraints of the NIH's initial vision for biomedical computing; 2) how and why researchers used NIH-sponsored computers at UCLA to create software tools that would obviate the need for life scientists to think mathematically.

Thomas Haigh
University of Wisconsin, Milwaukee

Knowing Numbers: How Numerical Software Libraries Changed Scientific Practice, 1954-1975

This paper explores the social and epistemological consequences of the adoption of mathematical software packages by scientists and engineers from the 1950s to the 1970s. Certain mathematical operations, most importantly the solution of differential equations and the manipulation of large matrices, appear in many different disciplinary fields. Using electronic computers it was possible to produce numerical approximations thousands of times faster than before, but this increase in speed exposed the limitations of traditional mathematical methods in which scientists and engineers were trained. New, more accurate methods were devised but these were hard to implement, requiring expert knowledge of both computer architecture and specialized areas of applied mathematics. During the 1960s, major laboratories such as Los Alamos, NASA's Jet Propulsion Laboratory, and Argonne had created standard libraries of mathematical routines to implement common functions. By the 1970s several businesses were selling these libraries commercially, moving certain kinds of mathematical expertise out of the laboratory entirely. I examine the consequences of this shift for scientific practice, focusing on the black-boxing of mathematical expertise into software, the creation of a new community of mathematical software specialists, and the consequences for scientific education and the social organization of major laboratories. Sources include oral history interviews, archival records, and conference proceedings.

Bill McMillan
Eastern Michigan University

The Origins of Structured Programming in the Mathematical Abstractions Implemented in the Transition from ALGOL 58 to ALGOL 60

By the early 1970s, the structured programming movement was reshaping academic computer science and professional practice. This rational approach to software design, which advocated a layered, abstraction-based view of software, was given great impetus and credibility by the NATO meetings on software engineering in 1967 and 1968, and by the recognition that undisciplined use of the GOTO statement had led to much tangled code that was difficult to maintain. The transition to structured programming was anticipated, enabled, and, to an extent, foreordained by the creation in the 1950s of programming languages derived from formal approaches to reasoning in mathematics and logic. ALGOL 58 was inspired largely by FORTRAN and, like FORTRAN, lacked several features critical for the clear expression of complex algorithms. By introducing block structures; local, dynamically-allocated variables; recursion; flexible means of passing data between routines (call-by-value and call-by-reference); and restricted use of the GOTO, ALGOL 60 provided the model of a modern programming language ready to meet the needs of software design widely recognized by the late 1960s. The thinking behind these advances and related ones, e.g. the development of the LISP programming language, followed directly from abstract models of computation such as Church's Lambda Calculus.

Brent Jesiek
Virginia Tech

Embedded Boundaries, Embedded Systems: Historical Trajectories and Contemporary Trends

From the Apollo and Minuteman guidance computers of the 1960s to the specialized electronic chips and circuitry that now reside in our cell phones, cars, and coffee pots, "embedded" or special-purpose computer systems have both a long history and a high degree of contemporary relevance. Yet to date, historians, social scientists, and other scholars have largely overlooked this important domain of technology. In this paper I begin to open up this area of research, first by presenting a brief historical introduction to embedded systems. I then turn more specifically to the emergence and evolution of embedded system design tools and techniques, beginning in the 1970s with the advent of new integrated circuit technologies and hardware design languages (HDLs), and culminating more recently with the software/hardware co-design movement. My analysis pays close attention to the historical negotiation of the fuzzy sociotechnical boundaries around the software and hardware, and users and designers, of embedded systems.

I also document how embedded systems technology and knowledge have been uniquely "black-boxed," especially in comparison with general-purpose computers. I conclude by discussing some of the political implications of my analysis, especially in light of ongoing debates over the merits of "open" verses "closed" approaches to the design and development of embedded devices and systems.

Chigusa Kita
Kansai University, Japan

Familiar Look, Revolutionary Technology

This paper explores the importance of user interface design to retain an interface similar to that used by entrenched systems as an important means of encapsulating new technologies within a familiar and accessible guise. As early as in the late 1950s, researchers at Japan Railroad Company started investigating the possibilities of building an automatic seat reservation system. The leader of the research group was Mamoru Hosaka, who formerly designed airplanes during the World War II. Being an outsider to the computer field, he did not stick to "digitalization" but could establish a unique approach to keep the analogue process to retain the same look to the workers at stations. Because he found the key to the success of the introduction of the new system would depend on the approval by the workers and users, and it is better to keep the proce s as long as possible So he encapsulated new technology in the system when it is possible. For example, this revolutionary system used stamps to print the tickets, instead of inventing a digital printout system which was one of the most difficult problems in Japanese information processing. The new reservation system was a great success, but contemporary researchers in the computer field in Japan could not admit it a "computerized system," but a "supecialized mechanical system."

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4.9 Ethnographies of Science and Technology Across Disciplines: The Theory and Practice of "Ways of Knowing"

Organizer/chair: Emily Murai
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Marnie Henderson, University of Minnesota, hende246 at umn dot edu; Lisa Franzen, University of Minnesota, franz143 at umn dot edu.

Through the work of researchers trained in Anthropology and Sociology, ethnography has transformed the way STS understands the production and distribution of scientific knowledge, not to mention the ways technological objects and processes are transforming human experience. Yet, ethnographies of science and technology are also shaping the way other social sciences and even humanistic disciplines investigate what panel discussant Karen-Sue Taussig has termed "the lived experiences and social contexts of people as they produce and encounter scientific and technological knowledge and practices in daily life." Through the presentation of four critical investigations of STS, this panel makes plain the ways a shared body of ethnography texts enabled junior scholars in fields as diverse as Geography, American Studies, Nutrition and Rhetoric to critically examine and broaden not only their own research projects but also their own disciplinary frameworks. Each participant will discuss cultural and social disconnects, as well as (mis-)understandings in perceptions of science and technology within topics as wide-ranging as the politics of mobility and disablement, cultural perceptions of health and nutrition, the micro-geographies of human-computer relations and the production of digital bio-citizenship. Linking together these seemingly disparate projects will demonstrate how ethnography and various disciplinary foci both enable and constrain researchers' access to different ways of knowing. Consequently, by bringing together varying theoretical frameworks, disciplinary backgrounds, and scholarly interests, this panel will reflect how STS scholarship can provide valuable contributions across disciplines, as well as how discipline-specific perspectives provide valuable contributions to STS.

Lisa Franzen
Department of Food Science and Nutrition, University of Minnesota, Twin Cities

The Other Side of the Stethoscope: Competing Medical Frameworks

Being an "active biological citizen," with advances in medical technology, has become a routine part of citizenship. According to the biomedical model this form of citizenship leaves inadequate room for alternative methods of activism for other cultures. The Hmong population is a minority group in the Unites States that, in a biomedical sense, may be viewed as mistakenly passive. Traditionally shamans, community healers, and herbal medicine are used to treat illness. Some alternative and complementary therapies

have been adopted by Western society, but biomedical methodology still reigns as the principal form of treatment. The struggle that exists between Hmong practices and Western medicine results from the challenging nature of the biomedical model against Hmong customs and beliefs, patient and health professional misperceptions, and issues involving scientific literacy. Health professionals are working in culturally diverse situations where they are forced to practice amid conflicting worldviews. Classically the deficit model of knowledge has been blamed on patients as opposed to cultural barriers that stem from the other side of the stethoscope. To understand and appreciate the value of cultural perspectives it is imperative that the historical development of ideas from a scientific and non-scientific foundation be investigated. Exploring methods of finding suitable contexts that fit within a cultural framework and worldview is going to be an integral part of working with and creating a flow of information. Just as it is necessary to update scientific knowledge, with advances in technology, it should be necessary to update medical knowledge within a cultural context.

Emily Murai
Geography Department, University of Minnesota, Twin Cities

Disembodied by Design: The Micro-geographies of Human-Computer Relations

In recent years, new and innovative human-computer interaction (HCI) design projects have shifted traditional forms of engagement between users and computers. For instance, while structural interfaces of computers like the mouse and keyboard have long been considered industry standards, one HCI design team is developing a web interface that utilizes the gaze of a user's eyes as a means to scan, scroll and click web pages (Langberg 2006). Such an interface minimizes the excess body movements of the hands and fingers and brings the body into closer alignment with the computer. My paper draws upon the conceptual frameworks and in-depth case studies of HCI design to examine how users' bodies are positioned and integrated into HCI design. The larger purpose of my research is to study the changing micro-geographies between users and computers, and in particular how HCIs attempt to reduce the spatial and temporal divides—and thus further consolidate—humans and computers. In this paper, I utilize key concepts developed in the ethnographic work of Stefan Helmreich (2002) and Joseph Dumit (2004) to specifically discuss the politics of the incorporation of scientific research on the human body into technological design. As the body represents both the physical boundaries and primary means for human engagement with computers, the ways users' bodies become rationalized and designed into HCIs provides strong measures of the changing geographies of human-computer relations.

Emily Smith
Department of American Studies, University of Minnesota, Twin Cities

Cyborgs for Sale:Mediating the Disabled Body/Machine Interface in the iBOT

As theorizing the cyborg grows more popular, many scholars have looked to people with disabilities as the forerunners of this trend for their highly interdependent relationships with technology. However, disability studies scholars have criticized this romanticized use of the disabled body for neglecting the lived experiences of those embodying the theory. In this paper, I will discuss how this debate is being played out within the assistive technology industry, where devices made by able-bodied designers frequently fail to meet the needs of disabled clients. In particular, I will examine the iBOT mobility system, a wheelchair that claims to "shatter barriers" through its ability to climb stairs. Drawing from ethnographic observations of sellers marketing the iBOT and my experience test driving it, my paper situates the iBOT within contested definitions over what makes a wheelchair a "success," illustrating how the ableism and techno-enthusiasm of the iBOT's designers shaped the design in ways that make it less appealing to many potential users. Common among assistive technology, the iBOT was created with an able-bodied "way of knowing," as the designers understood what it means to have this body-machine interface in a way that contradicts many wheelchair users' "way of knowing" through their everyday embodied experiences. Challenging the simplified uses of people with disabilities as embodying "cyborgs," this paper demonstrates the complex experience of attaching such a highly technological device to the body, an anxiety that needs to be explored both within the assistive technology industry as well as in science and technology scholarship.

Marnie Henderson
Department of Rhetoric, University of Minnesota, Twin Cities

Genetic Ancestry and Digital Bio-Citizenship: Portrayals and Perceptions of Recreational Genomics

Genetic ancestry testing, or what Catherine Nash termed "recreational genomics," has evolved from a mostly academic pursuit to a widely-available consumer enterprise, bringing with it concerns about the meaning of test results, the relation of test results to personal identity and group membership, and the ability of science to influence our understanding of ourselves and our contexts. Scholars have pointed out that test results often mean more to users than just finding out about their scientifically derived ancestral homeland; results can also mean access to money, power, and previously denied social and human rights. For some users, understanding genetic testing science and its results may be confusing and/or upsetting, especially when test results can place strain on deeply held knowledge about the self and previously unquestioned membership in social communities. However, for others, the results are exciting, interesting, and can inspire new relationships, often via the web. In this paper, I explore the various ways promotional and educational materials portray meanings of test results, as well as how, via weblogs and forum postings, participants come to understand their genetic ancestry. For this, I relate Paul Rabinow's bio-social groupings to recreational genomics and consider additionally, Nikolas Rose and Carlos Novas' concept of digital bio-citizenship. I discuss how consumer and user discussions within the genetic ancestry web communities are sites for further work in how consumer's perceive and understand genetic ancestry science, results, and meaning. In addition, these web-collectivities may

help researchers understand genetic ancestry's relation to personal identity and biological citizenship.

Karen-Sue Taussig
Deparment of Anthropology, University of Minnesota, Twin Cities

This panel is made up of advanced graduate students from an Anthropology graduate seminar at the University of Minnesota on the ethnographies of science and technology. While multi-disciplinary work in STS is not unusual, the wide range of disciplinary backgrounds represented in this group was quite unique. Hard science, social science, policy and humanities perspectives were all represented in the course, and as a result, the ways we engaged with the STS literatures and each other's projects inspired an awareness of the canonical and methodological approaches of specific disciplines and how disciplinary training affects engagement with a set of ideas more generally. The seminar truly put into practice questions and theorizations around 'ways of knowing,' and that sentiment will be reflected in both the papers and the discussant's presentation.

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4.10 Ways of Knowing the Mind and Brain: Anthropologies of the Psy Disciplines

Organizer/chair: Eugene Raikhel
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A central concern for anthropologists studying the psy disciplines is how expert claims about the mind and brain translate into enactments of personhood and ascriptions of agency. This panel will examine how psy knowledge is produced, disseminated, and contested through its application in disparate domains (biomedical, legal, and social). It will also examine the political implications that these differing ways of knowing (both psychodynamic and neurobiological) have on conceptualizations of personhood and agency.

While these have long been key issues for anthropology, they have taken on a particular urgency in the wake of three conceptual and empirical shifts: 1) the growing role played by the life sciences in the construction of psy knowledge and intervention; 2) the spread of new diagnostic categories and therapeutic practices throughout the world (fostered by the increasing interpenetration of global information networks and markets) and 3) the transformation of professional authority in relationships between researchers, clinicians, corporate actors, political activists, and patients (underpinned by a set of technological, institutional and political-economic developments).

The papers in this panel seek to examine how these fields of knowledge are both challenging and reproducing long-accepted notions of personhood and ascriptions of agency. Empirically, they ask how changing ways of knowing the mind and brain are being taken up in different political, cultural and disciplinary settings. Analytically, they examine how some possibilities are opened up and others foreclosed when these knowledges (and their attendant clinical practices) enter everyday lives or political arenas.

Matthew Wolf-Meyer
Dept. of Anthropology, University of Minnesota

What Matters?: Modeling Brain Damage in Biomedicine

In the late 20th century, neuroscientists evidenced a curiosity towards treating strokes and Alzheimer's disease with stem cells -- one of the many uses projected for stem cells in their treatment of human illnesses. The possibility of stem cell research conducted on human subjects is treacherous ethical ground due to the perception in some quarters of stem cells being imbued with "life;" as a result non-human experiments were necessitated, as well as scientific field trips to parts of the globe where legal sanctions against such research was less defined. Such displaced research demanded the modeling

of brain damage in non-human subjects, as well as attempts to bridge the non-human and human gap through the use of intermediary modeling. Based on ethnographic research conducted among biophysicists and neuroscientists concerned with the applications of stem cells in the brain, I argue that contemporary models of the brain are a form of pseudo-mechanism, more akin to models of the brain deployed in the early 20th century than as developed during its latter half. I compare the ideas regarding consciousness and the brain and their neuromedical treatments with the models of the brain as deployed in relation to the practice of lobotomy for the curing of some mental disorders in the mid-20th century. I argue that dominant neuroscientific ideas about the materiality of the brain and its agency compel the use of ambiguous ethical boundaries in research and treatment of mental disorders, resulting in indecisive bioethical models and the political hobbling of neuroscientific activism.

Livia Velpry
CESAMES, CNRS, INSERM, University of Paris V

Ways of knowing in psychiatric practice: assessing a case

In recent decades, there has been an attempt to standardize ways of knowing in psychiatry and make the discipline appear atheoretical and scientific. This change is associated with evolving conceptions of mental illness and personhood. French psychiatrists have resisted adopting the increasingly dominant model in international psychiatry, embodied in the Diagnostic and Statistical Manual of the American Psychiatric Association. This may be due to the strength of the humanistic stance of French psychiatrists, a stance that is preserved by their relative isolation from other countries. French psychiatry is characterized by an emphasis on psychoanalytic concepts and a holistic approach to the patient. Today the tension is quite strong between the two models of knowledge in French psychiatric settings, but the impact of this tension on practice has been little studied.

This paper is concerned with identifying the effect of this tension in practice. Using ethnographic data gathered in a community mental health centre of the psychiatric public system in France, I investigate how professionals assess and diagnose incoming patients. Two main conclusions are drawn. 1) Affiliation with one psychiatric model or the other reflects what professionals consider to be their clinical mission, and 2) the process of diagnosing patients is at least as concerned with identifying signs, including behavioural traits and elements of the patient's narrative, as with the pathology involved. Analysing professionals' ways of knowing in practice shows how different conceptions of personhood and illness benefit physicians by allowing them to engage with their patients on multiple levels.

Stephanie Lloyd
MEOS, University of Montreal

Ways of knowing oneself: medications and anxiety disorders

Throughout the past century there have been many ways of knowing oneself, many of which originated in medical and psychiatric fields. Different psychotherapeutic paradigms and medications have provided means of reading into one's character traits and deciding whether they are: normal or abnormal; good enough; or symptoms of pathology. People who suffer from anxiety disorders, as defined by post-1980 psychiatric nosologies, have an array of resources to choose from in order to address their difficulties. In this paper I will address how the use of different classes of medications, antidepressants (of the Prozac generation) and anxiolytics (e.g. Valium), can impact differently on how people think about and experience anxiety disorders. Their thoughts and experiences will be influenced by the way that the mode of action of the medications is explained, for instance, antidepressants are believed to act directly on the biochemical origins of patients' problems while anxiolytics are thought to act as anodynes to calm patients enough to address the psychological origins of their anxiety. But the choice of medications is not simply tied to physicians' therapeutic orientations. It is a part of a broader political and economic matrix that educates physicians about treatment options.

Elements of this political and economic matrix include the pharmaceutical industry, medical education and government policies concerning medications and drug companies. Though there are many contemporary ways of knowing oneself and experiencing one's psychological unrest, these are to a large extent limited by the macro forces constituted by professional and governmental policies.

Eugene Raikhel
Columbia University/McGill University

Coding post-Soviet brains: Affect and agency in emotional-stress psychotherapy

This paper traces the shifting meanings of affect and agency in emotional-stress psychotherapy, a suggestion-based form of therapy for alcoholism which is both commonplace and controversial in contemporary Russia. Developed during the 1960s and 70s to have multiple clinical applications, emotional-stress psychotherapy was shaped by several aspects of Soviet psychiatry: a neurophysiological style of reasoning which fostered attention to mechanisms of suggestion (in part by undercutting distinctions between the psychological and physical); the project of developing an explicitly non-Freudian form of psychotherapy; and a conception of "stress" as potentially productive. Over the past fifteen years, a version of the therapy known as kodirovanie [coding], specifically designed to treat alcoholism, has been particularly popular and commercially successful. Public and professional discussions of the technique have raised not only issues of efficacy and evidence, but the question of whether kodirovanie is an appropriate clinical intervention for post-Soviet society in political and ethical terms. Many critics characterize kodirovanie as a "manipulative" technique in which patients are motivated to sobriety through fear. In response, some practitioners have reframed the technique as one which ascribes agency to patients, while others have hybridized it with religious imagery and ritual. Throughout this process multiple translations take place: Soviet clinical practice is retooled for a contemporary context; and psychiatric notions of "stress" are translated into politically framed ideas of

"fear." Throughout, the uses of affect and ascriptions of agency shift in ways which reflect broader changes in post-Soviet subjectivity and personhood.

Ari Gandsman
Dept. of Anthropology, McGill University

Mental Health Teams, Human Rights and the Formation of a Post-Dictatorship Subject in Argentina

In the aftermath of the military dictatorship that governed Argentina between 1976-1983 and was responsible for the disappearances of an estimated 30,000 individuals, mental health teams have occupied an important role in the work of human rights organizations in the post-dictatorship transition. Argentina is renown for its vast psychiatric and psychoanalytic community – who were also targets of the dictatorship – and their work on human rights is seen as one of Argentina's distinctive contributions to psychoanalytic thought. They have been active in legal settings, testifying in court cases, as well as in the treatment of affected family members. Their work also involves investigations into the long-term psycho-social effects of the military terror with the production of a traumatic discourse to account for its widespread societal consequences. The knowledge produced by mental health experts has had profound implications for how the dictatorship is now understood, including the shaping of the narratives of affected family members. This paper aims to examine the way in which this knowledge has contributed to the formation of a distinctive post-dictatorship subject.

Discussant: Laurence Kirmayer
Division of Social & Transcultural Psychiatry, McGill University

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4.11 Ontology and Kin(d)ship in the classificatory practices of Human-Animal Relations

Organizer/chair: Carrie Friese
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Mary Weaver, UC Santa Cruz, marydweaver at gmail.com

The question of who comes to count as "kin and kind" (Haraway 2007) denotes the high ontological stakes in classifying breeds and species. These papers trace kin(d)ship' as being situated in and constitutive of relations across species, spatialities and temporalities. Mary Weaver's paper analyzes practices of canine-sorting in contemporary animal shelters in the U.S., addressing the intersection of making-killable (Haraway 2007) with the ontological stakes of human-canine relatings. Rheana Juno Parreñas looks at the distinction between forest-dwelling humans and orangutans, or 'persons of the forest' in Malay, as an essential component to the German philosopher Johann Herder's Post-Enlightenment notion of universalism. Carrie Friese explores how the varying ontological positions bodies occupy throughout the processes of cloning endangered animals. She shows how these bodies must be considered "endangered" and "domestic" at different stages in order to do the work of cloning itself, in turn highlighting the bio-political economies of both human-animal relations. We show how these different classifications are bound up in the representational and relational significances of animals in constituting the human within particular locales.

Mary Weaver
UC Santa Cruz

Kin and Kind in Dog Sorting practices: the question of making-killable in temperament testing

This paper addresses practices of thriving, life, and death in kill and no-kill animal shelters in the contemporary U.S. I focus on the sorting of canines into 'adoptable' and 'non-adoptable' categories through temperament testing. As the primary means of determining which dogs die and which might find, and become part of, a home, temperament-based sorting marks the boundary of kinship expectations between canines and humans. Moreover, sorting and breeding overlap in the moment of making-killable (Haraway, 2007), producing a conjunction of temporalities - the immediate (adopt or kill now!) and the durational (create and cultivate traits over time). The kinding of dogs and the killing of dogs intersect further when no-kill shelters favor certain kinds of dogs as 'adoptable' – a judgment often linked to breed and size - and conjoin ethics and breeding. Where and how specific types of dogs end up, whether or not they fall into which kinds of relatings, mark both the materiality of classification and the ontological stakes of this paper. The being of dog-with-human, as well as the responsibilities and responses

endemic to that relationship, torque in the overlap of shelter temperament tests and breeding. Thus, the conjunction of making-killable and making of kind describes which dogs and which worldings are rewarded, discarded, foreclosed, and/or effaced in contemporary animal shelter practices in the U.S.

Rheana (Juno) Parreñas
Harvard University

Peoples of the Forest: Orangutans and the Production of Universal Humanity in Post-Enlightenment Philosophy

Seventeenth and eighteenth century European 'exploration' lead to the exposure (and consequential exploitation) of tropical flora, fauna, and people. One such creature new to European knowledge was the orangutan, the great ape endemic to Borneo and Sumatra on Southeast Asia. The term 'orangutan' is rooted in the Malay 'orang hutan', which signifies "people of the forest."
The Post-Enlightenment German philosopher Johann Herder grappled with the distinction between different kinds of 'people of the forest.' He developed a concept of universal humanity which included Africans and Americans. Yet this was at the expense of other "people of the forest," namely orangutans. This paper shows that classifications between orangutans and people had at stake the greatest concern of the Enlightenment and Post-Enlightenment: the limits of universalism.

Carrie Friese
UC San Francisco

Transposing Bodies: Negotiating the Bio-political Economies of Endangered and Domestic Species

The work of distinguishing and counting species is critical to the work of endangered species preservation. With some exceptions, "hybrids" occupy an uncertain position between species bodies and are generally not considered "valuable" to conservation efforts. The recent uptake of somatic cell nuclear transfer to "clone" endangered animals is punctuated by the position of hybrids in conservation work. In these cloning experiments, the bodies and bodily fragments of "endangered" and "domestic" animals become entwined within particular situations. For some, the processes of nuclear transfer represent another iteration of hybridization. For many others, the processes of nuclear transfer denote a different type of relationship between species.

In this paper, I argue that hybridity does not offer an adequate lens for understanding the bodies and relations produced through cloning experiments with endangered and domestic wildlife. Rather, I find that Charis Thompson's (1996) concept of "ontological choreography" better addresses this relation, with which she highlights the dynamic and

coordinated processes through which entities move between different ontological positions. Using this concept, I trace how the bodies involved in the experiments to clone a gaur and banteng had to continually move between the status of "domestic" and "endangered". By tracing the ontological choreography of bodily fragments and their relations, I open up the bio-political economies of human relations with both endangered and domestic species as enacted in techno-scientific mediation.

Rosemary Robins
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The Oncomouse: a Biography

In 1988 the United States Patent and Trademarks Office issued the first patent on an animal: the Oncomouse. The mouse was designed as a tool for research being conducted at Harvard University into the genetic basis and heritability of breast cancer. Over the course of a decade the Oncomouse was variously successful and unsuccessful in acquiring the status of a patentable object in Europe and in Canada, and never without a struggle. The Oncomouse had led a quiet laboratory life before being thrust into the glare of the 'patenting life' debate when its sameness and difference to conventionally bred mice became an ontological matter of relevance in determining its legal status. This paper tells the biography of this famous mouse taking seriously its presence in our midst and its agency in transforming ontological and epistemic categories, such as discovery and invention, and natural and unnatural. This is a tale about the modification of an animal and of its effects on other animals, humans, nature, society, science and governance.

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Framing animal biotechnologies : When emergent biotechnical practices and knowledge meet multiple regulations.

The rise of regulations concerning the manipulation (cloning, transgenesis, …) of human beings and human biological products has been largely commented within the STS field during the last two decades. A contrario, during the same time, the regulatory aspect of animal experimentation was not paid much attention. This paper aims at analyzing the sets of rules regulating the most recent forms of animal experimentation. Whereas reflexions upon human (re)engineering often oppose ethics and the search for a better health, a better medicine, rules about animal experimentation and manipulation (cloning, transgenesis, …) emerge at the crossroad of many different stakes and perspectives : animal ethics, traditions of experimentation within labs, economic interests, possible commercial use, biosafety issues, … They are produced at very different levels and by different institutions (research ethics committee, biosafety agencies, local laboratory

arrangements, …). This thus results in a complex and sometimes unclear regulatory agencement, which can have a major influence on the research strategies of some biology laboratories.

Based on a detailed fieldwork in one those labs, this paper analyses this complex set of rules, and develop the following argument : regulations of animal bio-engineering are important not only because animal experimentation is the mandatory prelude of the potential application of different techniques to human beings, but also because this is one of the place where notions crucial to bioethics and the legal framing of biotechnologies are being stabilized or sometimes challenged (cf. the recent weakening of the notions of "gene" and "specie" by biological works).

Myra Hird
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"Ways of Knowing Interspecies Communities"

This paper concerns ways of knowing interspecies communities. It draws upon Mauss's influential work on gifting, Derrida's notion of violence and Levinas's work on human encounters with the Other. Mauss's theory involves the obligatory gifting of ourselves with outcomes that cannot be anticipated or calculated, leading Derrida and Diprose to refer to gifting as inherently violent. Diprose's notion of 'corporeal generosity' attempts to circumvent descriptions of closed economy-driven exchanges. Corporeal generosity draws attention to the generally overlooked debt that any body owes to other bodies and argues that gifting is both unpredictable and intrusive – there is as much possibility of threatening the integrity of bodies as there is of opening up new possibilities. While Kendall and Haraway highlight the corporeal generosity of gifting in terms of the human-Other (dog) encounter, I am interested in Other encounters between micro and macro organisms, specifically those between humans and bacteria. While these encounters are usually characterized as parasitic, violent and negative ('friendly gut bacteria' notwithstanding) I want to explore symbiogenesis as an example of the debt humans (and all species) owe to bacteria. Symbiogenesis provides keys to understanding the evolutionary debt humans owe to bacteria – a gift of history, futurity and becoming. Moreover, symbiogenesis concerns a paradigm shift within microbiology and evolutionary biology more generally. This gifting is as much a story about 'what is kept and what is ignored' – ways of knowing within biology and evolution and their historical and contemporary valuation.

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5.1 Knowing in Action: Where's STS?

Organizer/chair: Rick Worthington
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Collaboration between universities and various types of civil society organizations has become a standard feature in the business model of higher education over the past decade. In the United States, for example, the Campus Compact organization that encourages service learning for students now has over 1,000 college and university institutional members. The contributors to this session have participated in a variety of activist endeavors, and will draw on their experiences to address how STS scholars have been and should be involved. Each presentation will address one or more of the following questions:
• What does the term "politically engaged scholarship" mean?
• What unique qualities do STSers (and the ideas that travel with them) bring to university-civil society collaborations?
• What changes in organization, policies and culture would make these efforts more beneficial for the parties involved in them, and for society in general?
• What can or should the panelists, audience, and 4S members do to encourage these changes?

Rick Worthington
Pomona College

Silence, Technology and Society? Taking STS Seriously in Real Life

STS emerged in part from the social movements of the 1960s, and musters as radical a critique of conventional approaches to the production and use of knowledge as can be found in or out of the academy. But for all its critical posture, the field has had little presence in the worldwide movement to engage universities in collaborative social change projects. Europe's science shops are a partial exception, but even there most of the players are based in fields other than STS. In this paper I review the very powerful rationale for engaged scholarship that can be conjured from basic STS works, describe the landscape of community-based research and action in the U.S. and elsewhere, ponder the barriers to action that are unique to STS (there are plenty that apply throughout the academy!), and identify potential sources of a more favorable disposition by our field toward engaged scholarship.

Vasilis Galis
Linkoping University

Studying the Development of Athens Metro and the Greek Disability Movement: Neutrality, Reflexivity, and Epistemological Choice

The construction of Athens metro consisted of numerous preliminary studies, different public organizations that dealt with its development and several controversies concerning its design. One of these controversies referred to the issue whether the metro would be accessible to disabled people or not. Studying such a sociotechnical controversy often implicitly stipulates certain neutrality on the part of the researcher. But what happens to neutrality when the researcher becomes a part of the controversy or sympathizes with one of the opposing sides? The identity of the researcher also influences the choice of an epistemological standpoint. The methodological framework of this project also includes elements of an emancipatory research paradigm, that is disabled people were given an active methodological role. Doing research on disability implied that I undertook research that could be of practical benefit to the self-empowerment of disabled people and/or the appraisal of disabling barriers. At the same time, it would be almost impossible for me to dissociate myself from being viewed by disability organizations as an ally in their struggle. This does not signify the capturing of my research since it constitutes a conscious methodological choice that I made in accordance with the emancipatory research paradigm. What I am advocating is more democratic participation in the processes that contribute to the configuration of the built environment and more policy initiatives for reducing disabilities. The study embraces the goals of the disability community, without being captured by this constituency. This type of objectivity differs from the standard epistemology of mainstream science.

Bonnie Green and Sarah Goldingay
University of Exeter

Presenting 'A Present For Anna': Using Drama to Introduce STS Research into UK Schools

The applied drama production, "A Present For Anna", by Exeter University's theatre company in residence, ExStream, aims to bring social research on genomics and biotechnology to life for audiences of 16-18 year old UK school children. The play depicts a mock Human Fertilization and Embryology Authority (HFEA) public consultation, thereby allowing the student audience to become actively engaged with STS research on Pre-implantation Genetic Diagnosis and stem cell therapy.

The paper examines the unique capacity of applied drama forms in helping audiences become more informed about relevant social and technical facts, while also engaging them with technological controversies at the level of the lived experience of 'real' actors within the UK's regulatory environment. We will also discuss the rationale behind this project, suggesting how and why it is important for STS research to be made accessible, relevant and available to the public, in particular the 16-18 year old audience. Drawing on qualitative data collected in response to "A Present For Anna", we will show how this form allows teenagers to integrate complex ideas about science and society into their lives, and further, helps them develop an STS-based orientation to these issues.

Rachel Morello-Frosch, Rebecca Gasior Altman, Laura Senier and Phil Brown
Brown University

Research in Communities, With Communities: Case Studies Linking Research and Action in STS

We discuss two examples of STS engagement that elucidate the interaction of "ways of knowing" between scientists and communities. The first case examines place-based household exposure and biomonitoring research, which involves assessing the presence and concentration of chemicals in indoor air, dust, and in human blood, urine, breast milk, saliva, breath, or other tissue. In partnership with Silent Spring Institute (an independent research center dedicated to women's health and the environment) and Communities for a Better Environment (an environmental justice advocacy group in California), we are conducting household exposure and biomonitoring studies in Cape Cod, MA and Richmond, CA. Engagement with our study communities and advocacy groups has shaped how we collect data, interpret results, and report-back information to study participants and the public. The second case study examines service and consultancy by academics to community groups based on a recent project by the Brown University Superfund Basic Research Program, in which researchers and state agency personnel collaborated with community activists on a legislative initiative to mitigate the financial impact of toxic contamination on homeowner property values. Both of these cases highlight the need for a rigorous approach to evaluation of community-based participatory research, advocacy, and academic consultancy activities and suggests how STS and sociology can contribute to this discussion. Theoretical tools and concepts from the study of social movements and collective action, in particular, may illuminate discussions about the potential for expanding community-engaged research in the field of STS.

Laura DeNardis
Yale University

A Case Study for Empirically Grounded STS Activism: The Open Standards Movement

In recent years, victims of disasters like Hurricane Katrina and the tsunami in the Indian Ocean have been further injured by ineffective government responses that stem in part from incompatible information technology standards. How should STS respond to urgent issues like this that are situated in the thick of the technology-society milieu?

An attractive feature of STS is its undercurrent of politically engaged scholarship, whether meiotically buried in retrospective accounts or overtly manifested in activism and intervention. Two broad traditions of thought, constructivism and critical approaches, employ quite distinct methodological and theoretical approaches with

respect to political engagement. Constructivist research programs such as the Sociology of Scientific Knowledge (SSK) and the Social Construction of Technology (SCOT)

generally have used descriptive, empirically grounded methods to explain past events. Critical accounts directly practicing activism and intervention comprise a long disciplinary tradition spanning STS progenitors like Lewis Mumford and Jacques Ellul, technology critics like Langdon Winner, and feminist scholars like Donna In recent years, victims of disasters like Hurricane Katrina and the tsunami in the Indian Ocean have been further injured by ineffective government responses that stem in part from incompatible information technology standards. How should STS respond to urgent issues like this that are situated in the thick of the technology-society milieu?

An attractive feature of STS is its undercurrent of politically engaged scholarship, whether meiotically buried in retrospective accounts or overtly manifested in activism and intervention. Two broad traditions of thought, constructivism and critical approaches, employ quite distinct methodological and theoretical approaches with respect to political engagement. Constructivist research programs such as the Sociology of Scientific Knowledge (SSK) and the Social Constr

Gwen Ottinger
University of Virginia

Environmental Justice Engineers: Engaging Students and Social Movements through Activist-inspired Term Projects

To environmental justice (EJ) activists fighting industrial polluters and (often) regulatory agencies, STS analyses that help articulate critiques of official information and justifications for alternative scientific claims can be valuable. But in a movement where technical resources are crucial but scarce, assistance interpreting or collecting information about toxic emissions and their health effects is even more important. Closely linked, the two projects are potentially also easily combined, and STS scholars—by virtue of their own technical backgrounds or institutional locations that facilitate collaboration with scientists and engineers—are often uniquely positioned to engage with activists in their efforts both to produce knowledge and to use it strategically in expert-dominated contexts.

One potential site for such hybrid environmental justice engagements is the STS classroom, where students' involvement can not only contribute to the environmental justice movement but also be a source of concrete lessons about the social contexts of science and engineering work. This paper reports on a spring 2007 experiment in which second-year engineering students at the University of Virginia were assigned term projects tailored to the needs of environmental justice organizations; the projects incorporated both technical research and analyses of its broader contexts and significance. While acknowledging the value of students' projects to EJ activists, I focus on the importance of EJ engagement to student learning, showing how the projects—and activists' responses to their outcomes—influenced students' understandings of the importance of technical information to EJ activism and informed their perceptions of the social roles available to engineers

Langdon Winner
Rensselaer Polytechnic Institute

Tell the Truth/Stop the Plant: Lessons from an Activist Campaign

Overcoming an "inevitable development" and "done deal," citizens in the Hudson Valley waged a successful battle to prevent a global corporate giant from building a massive, coal burning cement plant. This episode in environmental politics resembles many ongoing struggles around the world. In this case a key element was a clever blend of local, democratically articulated knowledge along with the expertise of heavy hitters from engineering, law and the biological sciences. What lessons can we draw from the campaign to "Tell the Truth / Stop the Plant"?

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Deliberation or Declaration:
Evidence, Arguments and Agreements in Deliberative Forums

Deliberative forums are increasingly seen as a site where qualitative social science and policy processes can come together in order to elicit the different kinds of concerns and knowledges that exist about specific technologies or practices. This trend is particularly apparent in the case of genomic science and nanotechnology, where public consultations and discussions have been encouraged by scientists and policy-makers alike. Whilst it is possible to argue that some of this enthusiasm has been motivated by instrumental rather than democratic concerns it remains the case that such exercises, when done well, appear to fulfil the aspirations of an engaged and activist STS.

In this paper we reflect on our own attempt to combine this activist stance with STS. We report on a roundtable workshop organised to consider the treatment options for diabetes. The workshop was the culmination of a three-stage project in which elite interviews informed a series of reconvened focus groups (attended by people with diabetes, carers or lay citizens) which, in turn, set the agenda for the workshop. The aim of the workshop was to examine how a selection of participants from the interview and focus group stages would interact in a non-hierarchical, deliberative setting. In particular, we were interested in exploring the extent to which 'seeing' and 'hearing' testimony made a difference to the

views participants had expressed in earlier stages and the ways in which different kinds of knowledge and experience were weighted.

The outcome of the workshop was both frustrating and revealing. On the one hand things did not go according to plan – deliberation was much harder to orchestrate than we had anticipated. On the other hand, it was also very clear that the workshop did generate significantly different debates than either the focus groups or the interviews. The most obvious difference was the extent to which patient voices effectively silences other concerns, particularly those of lay citizens, whilst also encouraging a focus on the perceived short-term benefits of improved insulin pumps rather than, for example, the accepted but more distant benefits of stem cell research. Exploring the contingency of this consensus we thus conclude by asking whether and how such deliberation is 'better' than more conventional forms of qualitative research or decision-making.

END

5.2 STS & Information Studies Stream V: The Information Perspective on Scientific Information

Organizers: Jean-François Blanchette
Information Studies, University of California, Los Angeles
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Geoffrey Bowker, Santa Clara University <gbowker at scu dot edu>
Christine Borgman, UCLA <borgman at gseis.ucla dot edu>
Chair: Christine Borgman

New forms of scientific data capture and analysis have emerged over the past fifty years. They have impacted our understanding of the nature of scientific knowledge (the widespread adoption of models as experiment surrogates), the scope of scientific fields (increasingly, true transdisciplinarity is becoming more realistic as data is federated over wide ranges of disciplines) and are beginning to significantly impact the social organization of scientific work (for example, whether or not reward structures need to change to recognize the publication of databases). In this session, a group of information scientists present a variety of IS perspectives on scientific data.

Christine Borgman
Information Studies, UCLA

Information Perspectives

Information Studies programs have attracted faculty and students with backgrounds in social studies of science and the 4S conference has attracted faculty and student participants from Information Studies programs. What is happening at this intersection of fields? What lens do information studies scholars bring to social studies of science problems? Among those lenses are the identification of information flows; expertise in information organization, searching, and retrieval; experience in the design and evaluation of information systems; and an interest in the artifacts that result from informative transactions. The talk will survey these perspectives briefly to frame the panel discussion.

Diane H. Sonnenwald
Library and Information Science, Göteborg University

Human-Human Information Interaction during the Scientific Process

In several recent projects, we blended social science, information behavior and information system theories and research methods to: increase our understanding of scientific work and collaboration, including real-time information sharing practices; and, design and evaluate new work practices and technology. Our goal was to facilitate new ways of sharing and creating information during the scientific research process. One

project focused on facilitating information sharing and creation among dyads and small groups of scientists from different disciplines working together across geographic distances using a specialized scientific instrument that included 3D information visualization and haptic feedback. The other project focused on facilitating information sharing and creation within a geographically distributed research center of approximately 100 scientists. This presentation will discuss the theories and methods used in the projects, our successes and failures, and how we are building on the lessons learned in a new project.

Nadia Caidi
Faculty of Information Studies, University of Toronto

Information Scientists and the Health Sector

The interest in interdisciplinarity seems to have accrued in the past decades in academia. Beyond the rhetorics (and sometimes empty promises), there have been countless number of initiatives that have actually brought together people from across disciplines to collaborate on various aspects of large projects. This presentation examines two cases in which information scientists have been involved in collaborative research with teams of health scientists in a large Canadian university. The focus will be on theories and methods brought to the study of scientific information by information science researchers and practitioners, and the particular ways in which collaborative processes have shaped and at times altered their perspectives.

Elisabeth Davenport
Napier University

Managing organizational knowledge in e-science projects

Cooperation in large distributed projects is often partial, and participants in such situations rarely achieve all of the objectives that are outlined in project proposals. One way of addressing this issue is to think of projects in terms of organizational social capital. A number of information scientists have applied social capital models to explore patterns of information and knowledge sharing within and across organizational teams; they have found that difficulties arise when mechanisms for sharing are too narrowly defined, and are focused solely on formal models of processes and concepts. By framing cooperation in terms of structures and power relations, and sensitizing participants to issues of timing and presence, social capital models may stimulate a convergence of information science and STS. The presenter will briefly describe empirical work on a project that attempted to embed a social capital framework in a project management protocol. This raised a number of issues about the scope of information practices that support cooperation in scientific projects, and the resources that are appropriate.

Kalpana Shankar
School of Informatics, Indiana University

Scientists, Data, and Hybrid Technologies

STS researchers have argued that E-science and cyberinfrastructure research often fall into the trap of assuming that all science will inevitably embrace and benefit from the ubiquitous and powerful data access and manipulation possible their research generates. Sensors, streaming data, and very large-scale databases DO open up new possibilities for research, but like other users of information technologies, scientists reject some, embrace others, and employ more nuanced, hybrid ways of using these and other digital tools to work with information. The regularity and frequency of these hybrid practices opens up possibilities for the STS-oriented information studies researcher to "think small" – the goal of this paper. It argues for taking a phenomenological approach to understanding the production of scientific information as personal and social acts of creativity, professional identity formation, and sensemaking, acts whose understanding can benefit from an STS perspective and can add substantially to STS knowledge. Building on interviews with research scientists, this paper explores how we can approach the scientific data universe as a space where paper, databases, sketches, and notes commingle via and whose interactive, hybrid ways of handling data and information, while commonplace, are not simple and straightforward.

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What do we know about e-Social Science?

On the website of the UK ESRC National Centre for e-Social Science (NCeSS) <http://www.ncess.ac.uk>, e-Social Science is defined as the use of grid infrastructure and tools within social sciences, and it is claimed that innovative and powerful grid-enabled technologies would advance ordinary social science research practices. Despite the ample hopes and expectations towards e-Social Science revealed in the previous sentence, little is known about how it is perceived in reality. In this paper, we open up the black box of e-Social Science through reflecting on our work at NCeSS. We argue that e-Social Science has different definitions that are situated in the everyday work practices of multiple actors in this community. We explain the frequently used jargon and abbreviations, map the demography of the 'e-Social Science community' (who are the designers, developers, users), the state of art of the technologies, the use cases, and the

strategies used to encourage uptake and facilitate development. Our boundary work (liaison with different organisations and individuals in multiple disciplines) will also be addressed to show how collaboration in e-Social Science projects is facilitated. In examining the languages, artefacts, organisations and policies produced and used in the field of e-Social Science from a reflexive perspective, we provide an opportunity for rethinking the meaning(s), value(s) and the future(s) of e-Social Science from the views of both an insider and a boundary worker.

Blaise Cronin (discussant)
SLIS, Indiana University

END

5.3 How do We Know our Hearts are Diseased?

Organizer/chair: Anne Pollock
Rice U
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In illnesses of our hearts, like those of our minds, the organization of diffuse bodily experiences into discreet pathologies is contingent and contested. This panel brings together papers that attend to a wide range of venues that claim expertise on what heart disease is. Bringing together scholarship on pharmaceutical research, diagnostic categories, government regulation, longitudinal research, epidemiology, and pathology, this panel interrogates the question: How do we know our hearts are diseased?

Jeremy Greene
Harvard Medical School

The suburbs of disease: pharmaceuticals and the proliferation of cardiovascular risk factors

Perhaps no single transformation has altered the landscape of American medicine in the last 50 years as much as the expansion of the cardiovascular risk factor from a theoretical construct into a robust series of diagnoses demanding long-term pharmaceutical consumption on a massive popular scale. Public health efforts in industrialized nations are now dominated by attention to asymptomatic, numerically defined illness categories such as hypertension, high cholesterol, and asymptomatic diabetes. These numerically-defined diagnoses of risk hinge upon debated boundaries between normal and abnormal that are pushed outward by pharmaceutical marketers and public health advocates alike. This paper will narrate a series of historical interactions between research, marketing, and clinical practice that illustrate the role of pharmaceuticals in the expanding diagnosis of chronic disease. Particular attention will be paid to the mobile category of the abnormal as a colonizable buffer space between health and disease, with focus on the transformation of outlying borderline states into predisease states through mediation of an efficiently-organized economy of medical knowledge.

Anthony Hatch
University of Maryland

The Politics of Metabolism: The Metabolic Syndrome and the Reproduction of Race

Researchers increasingly use the concept of "the metabolic syndrome" as a new biomedical technology for producing knowledge about the heart. The syndrome is comprised of multiple biochemical and physiological risk factors for heart disease; it incorporates bodily measurements of hypertension, hyperglycemia, dyslipidemia, and

obesity. The metabolic syndrome not only constitutes a new way of knowing about risks to our hearts, it may constitute an important yet under-recognized location of emerging racial discourse and practice. A series of related deployments illustrate the multiple ways in which different conceptions of race are deployed in biomedical theories and practices concerning the metabolic syndrome. Biomedical research on the metabolic syndrome is routinely studied in racial groups and the findings are discussed in racial terms. These deployments not only involve scientific claims and theories of the metabolic syndrome and social categories of race, these polyvalent discourses have material effects in shaping the knowledge-making practices of clinical biomedicine, government population health surveillances, and the corporate development and marketing of pharmaceuticals. This paper a) investigates how the metabolic syndrome emerged as an object of biomedical knowledge and b) discusses how the syndrome came to intersect with multiple deployments of race in US biomedicine. In this paper, I trace the polyvalent aspects of race and the metabolic syndrome how both constructs are instruments and effects of an increasingly technoscientific configuration of biopower that is exercised over the metabolic health of racialized bodies and populations.

Jonathan Kahn
Hamline

Ways of knowing race and heart disease across regulatory regimes

Racial disparities in heart disease have received a great deal of attention from diverse sources, ranging from biomedical researchers and clinicians, to patient advocacy groups, to health policy makers. Knowledge, understanding and practice concerning such disparities are often approached primarily within the context of biomedical research and practice. This paper moves beyond this context to look at how knowledge about race and genetics is shaped and produced through encounters between biomedicine and diverse regulatory regimes within the Federal government that mediate between research and practice – particularly in the realm of developing drugs to treat heart disease. The paper focuses in particular on corporate filings made before the U.S. Patent and Trademark Office, the Food and Drug Administration, and the Securities and Exchange Commission that involve similar biotechnological/pharmaceutical innovations/products to diagnose or treat heart disease. It examines how and why discourses of race and genetics may vary across regulatory regimes and considers what sort of legal incentives each may present to shape constructions of relations between race and genetics in the field of heart disease.

Anne Pollock
Rice U.

Constructing and Supplementing the Framingham Heart Study's Typical White Americans

The 2000-present Jackson Heart Study has often received an intriguing moniker at medical meetings: "The Black Framingham." If there is a Black Framingham, what does

that mean that Framingham was? Did the landmark study that would become a touchstone for cardiovascular research for the second half of the 20th century lack race, or was it white? By attending to the Framingham Heart Study's early racial frameworks, I will show that its homogenized whiteness was a contingent and emergent aspect. The investigators did not simply start with an undifferentiated standard white human representative sample from which to extrapolate, but rather constructed one through two moves: (1) the disavowal of the concept of representation and (2) the construction of within-group differences as a way to produce scientifically useful knowledge that could be extrapolated beyond the group. They articulated changing concepts of both heart disease epistemology and whiteness in each of those moves, and at stake was who could stand in for "typical," "normal," and "American." I will bring Framingham into analytical relief through comparison with the Jackson Heart Study. The latter study makes similar use of the moves of disavowal of representation and attention to within-group difference, yet it is not a simple repetition of the Framingham Study. It is a self-consciously postmodern innovation taking off from it, a repetition with a difference. In Jackson, "typical," "normal," and "American" are each plural concepts.

Janet Shim, L. Katherine Thomson
UCSF

Social and Genetic Epidemiology of Heart Disease: Division of Labor, Jurisdictions, and Ways of Knowing

Social disparities in heart disease have increasingly engaged the concern of the epidemiological, medical, and health policy communities in the U.S. and globally. In this context, epidemiology serves as an essential tool for understanding the determinants, risk factors, and distribution of heart disease across populations. Recent public debates have focused on whether epidemiological knowledge can reliably and effectively answer important and increasingly complicated questions of disease causation and the sources of health disparities. One disciplinary response seems to have been an elaborating division of labor and expertise. On the one hand, the rise of genetic epidemiology is fueled by predictions or hopes that combining genetic analysis with epidemiological techniques will illuminate how much of the burden and risk of heart disease is the outcome of inherited characteristics. On the other hand, social epidemiology is an ascendant field that takes on the mission of articulating the role of social factors in disease causation. Yet particularly in the investigation of racial disparities in heart disease incidence, these sub-disciplines have very different and even opposing understandings of disease causes, and conceptions of the kinds of differences that are causally significant. This paper will provide a preliminary landscape of epidemiological research on racial disparities in heart disease, the jurisdictional negotiations the epidemiological sub-disciplines have engaged in vis-à-vis each other, and their efforts to redefine, in some sense, the boundaries of authoritative expertise-of different ways of knowing-about the compound and complex nature of heart disease.

Stefan Timmermans
UCLA

Why do so many people die from heart disease? Pathologists at work

Forensic pathologists investigate suspicious deaths such as suicides, homicides, accidents, and unexplained natural deaths. In spite of the variety of cases, the majority of investigated deaths (about 60-80%) are classified as a heart disease. Often, heart disease trumps circumstantial evidence about suicide and, occasionally, about homicide. Heart disease is also a common explanation for deaths that have characteristics of elderly abuse. Social scientists have generally argued that the primacy of heart disease reflects unduly "pathologization" of death and reflects the social decontextualization of death. Based on observations of how forensic pathologists processing suspicious deaths, I analyze how and when heart disease emerges as a sufficient explanation of a suspicious death. The achievement of heart disease as cause of death reflects the transformation of messy social and biological evidence into legally defensible classifications, each constituting its own context of relevance.

David Jones
MIT

Who Knows If Your Heart Is Diseased? Contested Pathophysiologies of Chest Pain and Heart Attacks

Few areas in medicine have been contested more vigorously than cardiac therapeutics, especially bypass surgery and angioplasty. In principle, both techniques of cardiac revascularization share a common model of heart disease: progressive obstruction of coronary arteries by atherosclerosis leads inevitably to ischemia, chest pain, and heart attack. Competing claims of expertise and efficacy have opened up cracks in this model, suggesting that the underlying mechanisms of chest pain and heart attack might actually be distinct. Angina, the hallmark patient experience of heart disease, might no longer be directly relevant as a marker of risk of cardiac death. Instead, risk is being reassigned to the now unstable notion of unstable plaques. These contested theories have triggered soul-searching among cardiologists and cardiac surgeons that presents an opportunity for social scientists to explore the claims and sources of expertise deployed in debates about cardiac pathophysiology and therapeutics.

 END

5.4 Bourdieu and Beyond: Theories for a New Political Sociology of Science

Organizer/Chair: Mathieu Albert
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Building on Pierre Bourdieu's theory of the social world and on Scott Frickel and Kelly Moore's "New Political Sociology of Science" (NPSS) research program (2006), this session seeks to bring together STS scholars interested in studying the political and economic dimensions of science, including socially-mediated power relationships within the scientific field. Our starting points are: (1) that scientific practices always take place in a structured network of actors endowed with different levels of power, and (2) that this network needs to be taken into account to gain a sociological understanding of these practices. In other words, we assume that groups of scientists never exist in isolation, but always in relation to other scientific groups, and are embedded within the political and economic fields. From a Bourdieusian and NPSS perspective, investigating these relationships is critical for understanding what scientists do and think (e.g., why they choose to produce one type of knowledge over another, why they define scientific excellence in a certain way, why they favor one methodology or one epistemology over another). The papers included in this panel fall into two broad thematic categories: (1) the influence of the political and economic spheres on scientific activities, and (2) the impact of power relationships among actors within and/or outside the field of science on knowledge production.

Jason A. Delborne
University of Wisconsin – Madison

Constructing Audiences in Scientific Controversy

Attention to audience construction during scientific controversy reveals assumptions about the political and institutional contexts in which contentious knowledge claims become sources of power. Scientists and their allies and opponents engage in struggles not just over what is true, but who may validate, access, and engage contentious knowledge. Audiences (and non-audiences) thus embody notions of legitimacy, participation, and representation. Analytical attention to how various actors attempt to construct audiences exposes (a) competing narratives to explain the significance of a scientific controversy, (b) beliefs about who has the power to tell the truth and who has the power to make social change, and (c) strategies that disrupt audiences constructed by opponents.

This paper applies a dramaturgical lens to the controversy over the presence of transgenic DNA in Mexican maize. The ensuing communication, critiques, and refutations of the original research showcase a diversity of attempts to construct audiences within and beyond the scientific community. Critically, actors do not create these audiences de novo,

but engage and modify existing audiences that stem from political, social, and institutional realities.

Janet Atkinson-Grosjean
University of British Columbia

Big science, small countries: genomics as an institutional order

Application of field and structuration theories to scientific governance illuminates how, through the accumulation of power and the operation of isomorphic forces, particular organizational models come to dominate a field. At the same time, historical institutional analysis alerts us to the way cultural and national legacies resist forces of conformity.

Large-scale organizations and networks have become the dominant mode of 'doing' the life sciences even in small nations. Drawing on preliminary empirical results from a comparative international study of 'translational genomics', the paper examines why this might be the case and how similarities and differences play out. While many studies examine macrostructural forces or the microdynamics of the laboratory, the meso-level of organizational analysis is often neglected in STS. The paper seeks to correct the imbalance.

Wendy McGuire
University of Toronto

Science policy and academic entrepreneurialism: How do scientists in the biotechnology field pursue academic legitimacy?

Enhancing Canada's economic competitiveness in the global "knowledge economy" has been a policy priority of the federal government in Canada for over two decades. Science policy has increasingly embraced an entrepreneurial approach to academic science, culminating in the 2002 launch of the National Innovation Strategy. As a result of this innovation agenda, new research funding programs and new research funding requirements of federal granting agencies increasingly require grantees to engage in industry collaboration and the commercialization of research. However, a number of disturbing trends have been found when faculty participate in commercial activities, including secrecy and withholding data, skewing of the research agenda towards commercial problems, financial conflicts of interest and changes in the quality of research and graduate training. This paper will present preliminary findings from interviews with non-clinical life scientists who are engaged in biotechnology research at the University of Toronto. Biotechnology is an area that has been heavily targeted for economic development locally and nationally. Using Bourdieu's concepts of field, capital and habitus, I will examine the strategies scientists use to compete for academic legitimacy, how academic legitimacy is defined, and how strategies are shaped by the amount and type of capital actors hold in relation to others in the field. How these strategies shape the structure of the field itself will also be explored. Comparisons will be

made across new (non-tenured) and established scientists, and more and less entrepreneurial scientists, as significant differences in attitudes towards commercialization have been found among these groups.

Reijo Miettinen
University of Helsinki

National Systems of Innovation and the Language of Science and Technology Policy

This paper deals first with how the term National Systems of Innovation (NSI) was adopted as the organizing term of Finnish science and technology policy in the 1990s. It also discusses whether and to what extent this policy influenced practical policy making or economic development in Finland. It concludes that it had hardly anything to do with the rapid development of the Finnish ICT sector or Nokia in the 1990s.

Second, this paper argues that, as a research agenda, the NSI approach has come to an end. It is unable to address the issues it regards as central, such as learning, and it disregards some of the key challenges of the science, technology and innovation policy. Alternative approaches and sources for policy language are considered. The first of these is the literature that focuses on the nature and institutional conditions of knowledge creation and creative work, and especially on the implications of the free/open source development model in software production for knowledge production. Second, the implications of the pragmatist concept of a self-experimental society are discussed. They suggest that social innovations should be initiated locally in all institutions of society. Forms of governance should be developed to promote the emergence and transfer of such initiatives and experiments.

Mathieu Albert, Suzanne Laberge
University of Toronto, Université de Montréal

The politics of social judgment on science: What do biomedical scientists think of the social sciences and why it matters?

The growing interest in interdisciplinary research within the Canadian health sciences sector has been manifested by initiatives aimed at reinforcing the presence of the social sciences (SoSc) in this sector. Drawing on Bourdieu's concepts of disciplinary habitus and field, our study explores the extent to which it is possible for the SoSc to integrate into, and thrive in, a field in which the experimental paradigm occupies a hegemonic position. Thirty-one semi-structured interviews with biomedical scientists (BMScts) were conducted to explore their receptiveness toward the SoSc. In addition, participants were asked to fill out a questionnaire on their socio-professional profile to unable us to explore the link between their perspectives on the SoSc and their professional trajectory and research practices. Results showed three major trends in the BMScts' receptiveness toward the SoSc: a majority was unreceptive, several were receptive, and a handful was ambivalent. Examination of the BMScts' career profile and disciplinary/epistemic habitus

showed that exposure to social science research contributed to the development of a favorable stance toward the SoSc. Those who had had the opportunity to participate in the development of social science research projects or to evaluate such projects as a member of an interdisciplinary peer review committee manifested the greatest understanding of social science research. Results will be discussed in the light of the new social dynamic prevailing in the emerging interdisciplinary health research field which fosters closer interactions between different disciplinary/epistemic habitus.

Chris Ganchoff
UC San Francisco

Scientist Activism and Human Stem Cell Research

One emerging strand within STS is what has been called the New Political Sociology of Science (NPSS). The NPSS focuses on the concepts of power, institutions, and networks among scientists and other actors, and approaches controversies and debates within the contemporary sciences with relational and structural perspectives. This paper employs the NPSS perspective to analyze the participation by scientists on California's Proposition 71, the California Stem Cell Research and Cures Act, which passed into law with 59% of the public vote. Scientists who work with human stem cells were central actors in support of Prop 71 and worked on behalf of the Yes on 71 campaign. A key role for the scientists involved explaining human stem cell research and the potential therapeutic outcomes to various audiences. This work gave the Yes on 71 campgain credibility but posed difficulties for the scientists. Given the conflictual nature of the political process, scientists were forced to make positive statements in terms of likely outcomes of human stem cell research. This position created dilemmas for scientists, in that they had to take public stands on the practices and purposes of controversial biomedical objects, which allowed opponents to voice criticisms, both about human stem cell research, and the financing and oversight of the biomedical sciences generally.

This paper draws upon a larger work that examines the mobilizations of scientists in terms of several structural factors, including the political and economic histories of California, as well as the transformations in the forms of knowledge production, such as universities and research institutes. Specifically, this paper examines the participation of scientists on behalf of the Yes on 71 campaign as a result of the new political opportunity structures opened up as a result of these different historical transformations. Scientist activism in support of human stem cell research has been growing due to the translational aspects of human stem cells; they are both interesting experimental objects and potentially valuable clinical objects. Supporters of human stem cell research articulate these experimental and clinical aspects together as reasons why state sponsorship of tihs research is vital. These new political opportunities provide benefits for scientists and their sponsors, as well as risks, as public debates increase the possibility for counter-discourses to the structural authority of the biomedical sciences.

Discussant: Daniel Kleinman
University of Wisconsin – Madison

END

5.5 Knowing Pain: The Cultural Logics of Pain and Drug Addiction Research

Organizer/Chair: Nancy Campbell
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Epistemological questions concerning the reconstruction of pain in experimental situations, how pain is measured and catalogued, and the relationship between chronic pain and self-medication for its relief are raised by each of the six papers. This session brings together historians who study the inter-connected yet far-flung social networks of pain researchers and those who study addiction to opiate drugs. Multiple scientific and social scientific projects to know how opioid drugs work in laboratory, clinic, and "naturalistic" settings are centered. The session also tracks the history and current implementation of clinical trials methodology, as well as techniques for measuring and producing pain and pain relief.

Marcia Meldrum
UCLA

"Our mire is quagged": Evaluating long-term opioid use for chronic pain

The paradoxical nature of the opioids -- highly effective pain relievers, yet potentially highly addictive and subject to abuse and diversion -- has caused anxiety for physicians, patients, drug enforcers, the media, and the American public for more than a century. In 2005-2006, a well-regarded health services research agency undertook a systematic review of the evidence supporting the long-term use of opioids for chronic pain. The project encountered several difficulties, including inadequacy of evidence and difficulty in defining appropriate criteria and outcomes. This paper discusses this project as a study in the malleability of the "objective" in therapeutic ressarch and an example of the conflicting values that underlie pain and addiction research.

Nancy D. Campbell
Rensselaer Polytechnic Institute

The Laboratory Logics of Pain and Addiction Research

Pain and addiction researchers seek to explain individual variation in responses to pain and pain relief, turning to their subjects for insight. Overlaps between the social networks of pain and addiction researchers in the mid-20th century reveal that social status depends on who subjects were. This paper concerns two laboratories where clinical research was conducted in the 1950s as part of an ongoing, federally-funded scientific collaboration to identify a non-addictive "painkiller." The Addiction Research Center in Lexington, Kentucky, exerted a virtual monopoly over the production of scientific knowledge claims about drug addiction. When its work is placed alongside the very similar work of the Harvard Anesthesiology Laboratory run by Henry K. Beecher at Massachusetts General

Hospital, interesting parallels and refractions appear. One laboratory was ultimately disgraced due to its situation in a "prison-hospital," while the other came to be upheld as the birthplace of the randomized, controlled clinical trial (RCT) methodology now in use. Given similar practices, laboratory logics, and attitudes towards human experimentation, what factors made the difference? Was it the "stigma" that accrues to illegitimate research enterprises? Was it presumptions about exploited research populations? Was it the different levels of prestige enjoyed by the larger institutions of which each thought collective was a part? Finally, how different was the performance of ethical subjectivity by scientists who worked in these very different social locations? Science, it appears, is more of a social privilege for some than others as scientific discipline is differentially enacted in different social spaces.

Noemi Tousignant
University of Montreal

Tying Pain to the Self: Measurement Techniques and the Psychologisation of Pain, 1940-1970

Since the late 19th century, scientists and clinicians have generated an astonishing array of technologies to quantify pain more precisely and objectively. Surprisingly, as efforts to objectify pain were intensified from the 1940s, pain was increasingly conceptualised as a subjective experience, that is, as a phenomenon inextricably tied to the unique emotional, psychological, and social condition of the experiencing self. In this paper, I explore the links between this process of subjectification and the mobilisation of techniques of objectification.

First, I trace the origins of new techniques of pain measurement in a growing investment into psychosomatic and analgesic research from the late 1930s, and examine the reasons for this investment. My main focus, however, is on how these resources were used to create new material, social, and technical conditions of experimentation, under which pain could be measured as a phenomenon that depended individual psychologies. In particular, I will follow the trajectory of the dolorimeter, a popular new pain-measuring technology that was introduced in 1940. This reveals links between practices of objectification; the social, material and technical resources on which these practices depend; and changing conceptions of pain, subjectivity and objectivity.

Marian Katz
UCLA

Pharmaceutical use in the narratives of children with chronic pain

The proposed paper examines one finding emerging from the UCLA Pediatric Pain Research Project (PPRP): that pharmaceuticals encode multiple meanings and constitute a major theme in children's narratives about their chronic pain experiences and their search for alternative treatments. It explores the contexts, meanings, and perspectives of pediatric pain patients' narratives about pharmaceuticals and what these narratives reveal

about how these experiences with pharmaceuticals affect childrens' self-understandings, attitudes towards doctors and medicine, and decisions about how to manage their pain.

Emma Whelan and Mark Asbridge
Dalhousie University

'Crisis? What Crisis?' Pain Medicine Responds to the "OxyContin Problem"

OxyContin, a controlled release pain medication, was approved for medical use in Canada in 1996. Within five years, the popular and medical presses had begun to report the use of OxyContin as a street drug, particularly in poor rural communities along the eastern coast of North America, earning it the nickname 'hillbilly heroin.' State responses add to the problematization of the drug by emphasizing its illicit use and by enhancing surveillance and monitoring of those who prescribe and use the drug. In 2004, the Canadian Pain Society (CPS), the national association of pain specialists, criticized the media frenzy surrounding the drug, arguing that "Patients with moderate to severe pain...should not be denied medications that can provide needed relief, nor should they feel afraid or ashamed to take the medication they need because these legitimate products have become stigmatized as ?drugs of abuse.'" To counter OxyContin's problematization, the Society developed normalization strategies that draw, in part, upon the generally distinct field of addictions medicine. This paper reports on an in-process, three-year study of the responses by pain medicine and addictions medicine experts to "the OxyContin problem" as constituted in North American, particularly Canadian, state and news media discourses.

Alexine Fleck
University of Pennsylvania

Unruly Subjects: Pain, Pleasure and the Trouble with Trauma Theory

Questions about how one should witness and then document suffering have persistently troubled ethnographic research. A corollary, and perhaps more troubling question concerns pleasure. How does one locate and accommodate moments of pleasure in what initially appear as horrifying scenes? In this paper, I attend to the complexities of witnessing and textually representing the violations, traumas – and sometimes pleasures – of drug use and addiction. By foregrounding the presence of the researcher, the act of witnessing, and the process of rendering an event into a text, I return to issues of responsible witness and representation as they pertain to stigmatized and underground activities such as drug use and the sex trade that often accompanies it. I examine a range of texts, including drug ethnographies and photography collections, in the context of research ethics and phenomenological philosophy in order to interrogate representations of drug users in all their unruliness. Attending to moments of stigmatized pleasure troubles feminist trauma theory's politically expedient reliance on clear, and therefore problematic distinctions between innocent and guilty, victim and victimizer. These divisions break down once trauma theory goes from the abstract to the particular, as it does in the ethnographic and photographic texts I consider. Although such divisions are

necessary in certain political contexts, to ignore the pull of pleasure as well as the push of pain is to cast drug users from the realm of the human, a philosophical and literal action no one can afford to make.

Discussant: Jackie Orr
Syracuse University

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5.6 Institutional Decision-Making in Disaster Response

Organizer/chair: Rachel Dowty
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Institutions have rules, guidelines, and procedures on how to handle different sorts of crises. To respond in a way that seems rational and reasonable, organizational risk management must draw from sets of culturally-acceptable values. Differing approaches to risk influence priorities and justifications for collective action. Presenters will discuss ways in which institutions evaluate and prioritize information to make decisions in disaster response situations. How can researchers assess the roles played by organizational cultures in deciding what constitutes a reasonable disaster response? On what values do institutions base ideas of rational decision-making when crisis strikes? Responses to Hurricane Katrina in and around the New Orleans area by the Coast Guard, FEMA, the White House, and emergent groups on-the-scene will be discussed using anthropologist Mary Douglas' grid-group approach to cultural bias. Building computer models to run simulations of organizational cultures in crisis situations offers other possibilities to examine how priorities for disaster task resolution are collectively set. Priorities for institutional disaster preparedness set by systemic norms raise questions regarding how institutional values shape the disaster outcomes. Panelists address these and other issues, presenting research findings and opening discussion of ways of identifying risk and what to do to resolve disaster when it strikes.

Rachel A. Dowty, Colin Beech, Peter J. May, William A. Wallace
Rensselaer Polytechnic Institute

Knowing Chaos: Cultural Biases and the Katrina Response

We apply cultural theory to derive insights about how various organizations responded to Hurricane Katrina in and around the New Orleans area. We argue that the role of organizational culture in shaping decisions needs to be understood in terms of ways organizations use knowledge differently when responding to the same crisis situations. Organizational cultures are considered in terms of the grid-group typology, first proposed by social anthropologist Mary Douglas and later developed for application to political cultures by Michael Thompson, Richard Ellis, and Aaron Wildavsky. An organization's dominant cultural bias characterizes what rationality it applies in a specific context. Four possible cultural biases characterize ways that rules structure internal and external interactions ("grid" dimension) as well as integrate internal and external group ties ("group" dimension). Based on the data, we characterize general organizational strategies of the Coast Guard as having hierarchical cultural bias, FEMA as fatalist, the White House as individualist, and emergent, on-the-scene groups as egalitarian. Using this approach enables examination of Katrina responses to understand how organizations (1) face consequences, and (2) decide upon justifications in times of crisis. Analyses use data gathered from teleconference transcripts among federal, state, and local organizations during the response, Senate hearing testimony transcripts, government response assessment documents, and source-verified newspaper articles. We draw from these documents consequences and ways of justifying and criticizing organizational actions aimed to resolve crisis tasks. Consequences and justifications of actions help characterize how organizations decide to use information differently to understand and respond to emergency tasks.

Edward J. Woodhouse
Rensselaer Polytechnic Institute

The Lessons of Katrina for Intelligent Public Decision Making

Was the Hurricane Katrina disaster an aberration, or did it emerge from decision-making processes similar to those governing other public outcomes? Is it more reasonable to expect post-disaster analyses to lead to systematic learning and improved policy, or not to change very much? Most generally, what can be learned about appropriate expertise and usable knowledge from the Katrina experience? I argue that many of the same processes and institutions are at work to create vulnerable populations, design the built environment carelessly with respect to public values, place barriers in the way of preventive action, and make it difficult for experts to contribute to improved outcomes. No doubt there will be some hurricane-specific learning in Katrina's wake, such as more houses on stilts, but political influentials are unlikely to revamp the systemic norms, practices, and institutions

that helped shape the disaster. Implications are discussed for interdisciplinary, problem-focused research and community service by scientists, engineers, and other experts.

Gary Bowden
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Hurricane Katrina as a System Accident

On August 29, 2005 Hurricane Katrina came ashore in southeast Louisiana. This was the first of several tightly interconnected events that would unfold in the city of New Orleans over the next few days: 1) the devastation from the hurricane itself, 2) the flooding of much of the city resulting from the breeching of various levees by the hurricane's storm surge and 3) the decent toward a Lord of the Flies, fend for yourself, anarchy (at least for a brief period of time in substantial portions of the city). One of the most consistent findings in sociological studies of disaster is the socially unifying effect of natural disasters. Even after adjusting for the exaggerated media depiction, the fact remains that the resulting social response was highly atypical. How do we account for this fact?

The proposed paper answers this question by viewing disasters not as events but, rather, as the actualization of system vulnerabilities. Specifically, Perrow's concept of system accident is used to highlight the unexpected interaction between the three systems: natural (climate, weather), technological (flood control, transportation and communication) and social. Particular attention will be paid to the historic roles of race, poverty, and the police in social control in New Orleans and how the flood disturbed normal expectations surrounding patterns of social interaction and led to the emergence of anomic conditions.
Environment

Roberto Barrios
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Knowing neighborhood priorities: Planning and governmental rationality in the reconstruction of New Orleans after Hurricane Katrina

Media representations of the aftermath of hurricane Katrina in New Orleans called attention to the fundamental inequities that underlie the socio-economic structure of North American cities. Consequently, local government officials, development non-profit organizations, and national philanthropic agencies have heralded recovery planning in New Orleans as a "ground up process" through which the voices of city residents will become the mandate that guides the reconstruction. This paper uses the analysis of planning documents and ethnographic observations of the drafting process of the United New Orleans Plan to examine the methodological and political complications of producing such a mandate. The paper maintains a concern with the ways expert

knowledge has historically been prioritized as an objective means of determining the needs of a population, and the arrangements necessary between people and resources to produce societal wellbeing. Anthropological writings on the subject matter have demonstrated how, although presented as objective knowledges of culturally transcendent societal truths, such expert knowledges have been articulated through vernaculars that enact hierarchies of class and race. This paper examines how architects and planners produce the "voices of city residents" as planning documents, and explores the contestations and cultural politics that inhabit the making of consensus in recovery planning after Hurricane Katrina.

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Knowing "The Other" in Contextual Loss

Natural and human-made disasters, such as hurricanes and space shuttle explosions, are typically known "by the numbers." Their causes and effects are usually captured by "regulative" knowledge, that is, factual reports, professional accounts, and theoretical models that provide information about the devastation or human error--their conditions and situations--with the expectation that such knowledge will either prevent them in the future or provide information that will ameliorate the consequences when they occur.

However, geo-political-technological disasters also bring forth documentary evidence of human loss that cannot be known in statistical and graphic ways. Individuals surviving or finding significant relationship to catastrophe live with immeasurable destruction, disconnection, and anomie; and the emergence, if not already present, of a deep liminality, or a living in the in-between.

The purpose of our presentation is to integrate and demonstrate complementarities with ways of knowing related to disaster and loss. That is, we will overlay vertical and horizontal knowledge and thereby evoke new languaging wherein one can uncover, engage, understand, and appreciate "the other in contextual loss." The focal point in our presentation will be the human experience of the impact of civil war as reflecting loss in a particular African community as demonstrated through an evocative photograph that we will use as an exemplar of another way of representing critical incidents. Our paper will discuss the joint and seamless use of rhetorical, hermeneutical, statistical, and systemic perspectives on a single event of loss and disaster by locating it with the survivor-as-knower and the scholar-as-witness.

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Mind Maps, Memory and Relocation after Hurricane Katrina

Based on interviews and mapping exercises with hurricane Katrina evacuees, this study employs sketched, Google, and overdrawn maps of origin neighborhoods in comparison with similar format maps of neighborhoods of relocation to examine the situatedness of local spatial knowledge in daily interaction, its disruption, and its rebuilding. Findings are examined in light of Turnbull's analysis of ethno mapping techniques. The research explores the challenges of translating mental maps and visual knowledge onto paper when researcher and participant may not share visual cultures or may use and understand the same visual representations differently. It also explores how everyday spatial perception and real-life lived boundaries are raced and gendered by restrictions of navigation. Techniques are map-elicitation, photo-elicitation, in-depth interviews and participant observation.

 Discussant: Edward J. Woodhouse

 END

5.7 Energy, Climate Science, and Sustainable Consumption

Organizer/chair: Thomas Berker
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Ulrik Jørgensen, Department of Manufacturing Engineering and Management, Technical University of Denmark, Denmark, uj at ipl.dtu.dk
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The ever-growing concern for man-made climate change and fossil fuel depletion addresses science and technology as both the problems' cause, their witness, and their potential remedy. This threefold role challenges Science and Technology Studies (STS) in at least two ways:

First, there is the problem of a definition of (non)sustainable practice. Recent debates about the man-made character of climate change have been conducted referring to complex scenarios from climate science, while calling for immediate political action (or trying avidly to avoid it). The same applies for instance to theories of 'peak oil', which recently have resurfaced again. One of the puzzling aspects of these debates is the urgency of the public concern for the relation between nature, science and politics, which

is also one of the topics attracting more and more attention within STS.

Second, more and more often STS is asked by politicians and engineers what it can do to make science and technology more sustainable. This appeals mainly to two different areas of STS research: studies of technology use in everyday life and innovation studies.

Put in more general terms, STS can be expected to have an answer to the question of science and technology's potential to contribute to more sustainable practices. Here the whole range of events and activities connected to science and technologies is relevant: Research, the implementation of scientific findings and new technologies, and finally their public understanding and use in everyday life. All these aspects are well-researched within STS and its neighboring disciplines. We invite contributions from scholars, researchers, and practitioners working in these fields to participate in this session.

Michael Søgaard Jørgensen
Department of Manufacturing Engineering and Management, Technical University of Denmark

Innovation and Participatory Design in Planning and Use of Sustainable Houses

This paper discusses the preliminary results from an ongoing research project about aspects of innovation and participatory design in the planning and use of sustainable houses. The project analyses the experience from recent projects about sustainable houses, which are at the planning or the use stage, in order to develop proposals for future innovation, diffusion and research within the field. The topics in focus are a) the interaction between construction knowledge and environmental knowledge in the planning of the houses; b) the applied strategies for reduction of resource consumption and environmental impact and the roles these strategies give to technology, user and context; c) aspects of participatory design by occupants in the planning and the use of the houses; d) the role of national and local infrastructures in the planning and use; e) the integration of experiences from the planning and use integrated in the development of the future strategies and concepts of planning and constructing entities. The case studies show the important role in the planning and design of the houses of local governmental housing policy, environmental consultants as boundary agents and public environmental guidelines as boundary objects. Finally the case studies show how the perception of the future occupants or the occupants themselves play a role in the design of the houses. Furthermore, that the use of the house should be seen as the final part of the design process through the domestication of the house and its facilities.

Midori Aoyagi-Usui
National Institute for Environmental Studies, Japan

Understanding climate change issue and nuclear power

Nuclear power generation is supposed to be "Clean" energy source, because it emits almost no carbon dioxide. Climate scientists especially in the field of mitigation and

adaptation begin to talk about the nuclear power for reducing carbon dioxide to meet Kyoto target, and future target now they begin discussing. Seeing those circumstances, we carry out 1) nationally sampled public opinion survey, 2) group interview survey of Tokyo metropolitan area, both about the climate change and nuclear power. Our results show a) Many respondents have answered that there has been something wrong in the weather recently, b) but, significant number of respondents oppose to build more nuclear power generating facilities, and prefer renewable energy, c) the main reason of opposing nuclear energy is distrust of power generating companies, and residuals from the nuclear plant.

Marianne Ryghaug
Department of interdisciplinary studies of culture, Norwegian University of Science and Technology, Norway

Public understanding of climate and energy issues

The problem of public understanding of climate and energy issues may be considered as a classical problem of knowledge transfer. From a communication theory perspective the answer to this problem would be to detect and mend possible weaknesses in the sender apparatus, to look for weaknesses in the receiver apparatus or to discover weaknesses in the media itself. Theoretical contributions from STS, like studies on knowledge production and transdisciplinarity, expertise and ANT are well suited to improve our understanding of this relationship. The paper investigates the perception of climate change and its implications in the Norwegian energy policy constituency. How does the Norwegian public perceive the issue of global warming, the national energy situation and their own energy consumption? Under what conditions may they shift towards the use of more sustainable energy technologies?

Public understanding of science has been studied out of a worry that scientific knowledge is not sufficiently appreciated and understood by the general public. Findings from such studies are diverse. While some studies test public knowledge, which is problematic, others approach the issue with a greater concern for understanding the way the public constructs its understanding of concrete aspects of science. In this paper we pursue the latter agenda drawing upon focus group interviews with lay people.

Siri Hall Arnøy
Department of Interdisciplinary Studies of Culture, Norwegian University of Science and Technology, Norway

Policy for and from hydrogen technologies

Hydrogen has been portrayed as one of the most promising energy carriers of the future. However, more than 160 years after the fuel cell was invented the technology is still mostly a dream. This demonstrates that development of hydrogen technology needs more

powerful allies in order to become reality. In this paper I am trying to contribute to a better qualitative understanding of what sort of political and social dynamics and impulses towards change are at work when new energy technologies are introduced. Visions of what a technology may become play an important part in the scientists' enrolment of allies. Furthermore, scientists and engineers make important contributions to the development of policy and politics 'from below', both by defining new conditions and options and by building networks around the technology under development. Taking these assumptions as starting point, several questions arise with regard to R&D communities:

- What kind of visions exists about the development and contribution of new hydrogen technologies?

- Are these visions communicated, and if yes, how and to whom?

- What sort of scientific, industrial and political networks are put into motion, and which plans exist for making these networks grow?

- What function do these networks have in relation to development of visions and discussions of possibilities for the new technologies?

The research project, whose approach and preliminary findings are presented here, tries to answer these question using a combination of a broader interview study and an in-depth analysis of two specific R&D-communities.

Robert Næss
Department of Interdisciplinary Studies of Culture, Norwegian University of Science and Technology

CO2 storage - the Norwegian moon landing?

The Norwegian prime minister recently said in his New-Year speech that: "It is our vision that within seven years we will have put in place capture and storage technology. This will be an important breakthrough in the efforts to reduce greenhouse gas emissions in Norway, and once we succeed, I am convinced that the rest of the world will follow our example. This is a major project for our country. It is our moon landing." (1)

Energy policy in Norway is shaped in the interaction between politicians, public agencies, industry and R&D communities. While climate change considerations obviously play a part in the shaping of energy policy, it is also clear that other considerations may be more important. In this paper we study how global warming issues are taken into consideration in the long-term strategy for the shaping of the energy system with particular emphasis on new sustainable energy technologies. A main focus will be on the present efforts to promote so-called CO_2-free gas power stations and hydrogen. How do energy policy actors, including relevant industrial and R&D communities,

perceive the issue of climate change, and how does this perception influence their actions in relation to energy technologies and patterns of energy use?

The study is based on an analysis of relevant governmental white papers and interviews with politicians, representatives of public agencies and industry. Studies of industrial actors are particularly important as their decision-making is crucial in the final instance. Interviews focus on the perceptions of climate change and the possible policy and industrial measures that may be put in motion.

1) http://www.odin.no/smk/english/news/speeches/001001-090938/dok-bn.html

Jøran Solli
Department of Interdisciplinary Studies of Culture, Norwegian University of Science and Technology, Norway

Translating Climate knowledge. Scientific knowledge, transdisciplinarity and the performance of expertise in preparing the transport sector for climate changes

Assumptions about climate changes may have considerable impact on investments in and the management and maintenance of transport infrastructure and the transport industry in Norway. Thus, the development and diffusion of knowledge about climate changes and their potential impact on the transport system will be of crucial importance to be able to prepare for such changes. In this paper I will investigate how important groups of actors linked to the Norwegian road system understand climate change issues, how these issues may impact the road system, and their strategies to prepare for the impact of climate changes with respect to road infrastructure across Norway.

A main assumption is that the understanding of climate changes among the main stakeholders of the road system is mediated through the occurrence of extreme weather rather than through information from climate research and related scientific knowledge. The paper explores the consequences of such mediation and the challenge this poses to climate research and policy.

Actor-network theory could help us think about how the use of climate change knowledge can move upwards and sidewards from local authorities, local knowledge and expertise. An analytical focus on translations means to look at the construction, or lack of the construction, of actor-networks. This may enable us to discuss how centres of actor-networks are (to be) equipped in order to be able to strategically enroll objects and actors that they need to appropriate climate change knowledge in the decision making processes.

Thomas Berker
Department of Interdisciplinary Studies of Culture, Norwegian University of Science and Technology, Norway

Aesthetic energy use in everyday life

Technical and economic understandings of energy use and energy systems still dominate the field of energy research. This is despite considerable efforts to the opposite by scholars from STS, cultural studies, and neighboring disciplines, which have over and over again pointed out how crucial social and cultural factors are for how and how much energy is produced, distributed and used.

In this paper I present approach and preliminary findings of a research project ("Paradoxes of design: Aesthetics as a barrier to sustainable consumption?", funded by the Norwegian Research Council), which addresses phenomena which are deeply rooted in society and culture: energy design and use for leisure and luxury. These are interesting for at least three reasons. First, energy use for leisure and luxury continues to have a steep growth curve in most industrial countries. Second, this growth is particularly difficult to control, since it is prone to so-called rebound effects – the simple fact that money saved through energy efficiency measures can and often will be used to consume even more energy. Third, we expect to learn more about the relation between technology, policy, society, and culture by looking at this neglected part of energy consumption and design: that energy is used to produce joy and aesthetic experiences.

So far we have two main sites of exploration on our preliminary empirical research agenda: Domestic spaces and sports-related leisure activities. The first addresses contemporary domesticity which according to the literature includes symbolic representation of one's self and feelings of coziness and security, all of which is highly relevant for energy design and consumption. The latter, sports, is an area, whose energy-related aspects are largely unchartered territory.

I am very sorry for submitting the form twice, I must have pressed a wrong key - _this_ is the actual and complete submission.

We welcome additional individual paper submissions which fit into our session proposal. The natural choice for us would then be to break the session into two tracks: one about "energy and sustainability" and the other about "climate change and sustainability".

Erik Hagelskjær Lauridsen
Department of Manufacturing Engineering and Management, Technical University of Denmark, Denmark

Converging technological paradigms in sustainable buildings?

On the basis of an ongoing project on emerging trends in sustainable buildings in Denmark, this paper investigates the design paradigms of the characteristic technologies of the sustainable house. The sustainability issue is integrated into particular technologies as design paradigms, as the normativity of the sustainability issue is translated and

constituted in guiding visions and design rules as well as the material artifacts of building technologies. Although continuous and increasing regulatory focus on energy issues has emerged in building codes, this is not uniformly reflected in the different technological elements of the building. For some technologies visions of sustainability appear to be strongly incorporated (such as insulation) while this is less evident in other technologies (as for example windows). Should the development of sustainable buildings be seen as a process of combining individual products and solutions, that are primarily brought together by the building as a physical entity, or are common understandings of technologies as contributions to the building as a system developing, e.g. as shared future visions. Should lack of convergence be seen as an unavoidable outcome of the complexity of a building, or are there new opportunities of coordinating the design and innovation of building components?

END

5.8 Stabilizing Multiplicity

Organizer/chair: Zara Mirmalek
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Sophia Efstathiou, <S.Efstathiou at lse.ac.uk>, University of California, San Diego;
London School of Economics and Political Science

In STS, we have been engaging in revealing the invisible contexts, such as political, social, economic environments and hierarchies of knowledge, that constitute the multiple ways in which a single object, career, or idea has been formed. This act of revealing takes us to looking back into the past, or present.

In this session, we are interested in a conversation about the future. When and how is multiplicity advanced? And when and how can multiplicity advance? At what level of science practice and in what form? In what circumstances is the tendency to select a unique standard resisted? What are the consequences of multiplicity for epistemology? For ontology? And, in what sites do we find these often invisible consequences emerging as visible?

We want to share and develop insights from multiple perspectives. As such, we make this process an experiment for enacting multiplicity. We approach 'multiplicity' from various points of entry situated in current ethnographic and theoretical work –and work contexts- in science and technology studies. And, we advance these perspectives in a process that aims to provoke, fracture, and recombine, seeking ways to optimize and to achieve action; the method is practiced through sharing (papers, perspectives, and discussion) and consideration (mutually developing the discussion arrangement with thought to the perspectives of the participants, presenters, discussants, and conference attendees).

Jerry Doppelt
University of California, San Diego

Do Multiple Values Allow A Critical Theory of Scientific Knowledge?

How do multiple political and epistemic values enter into the constitution of scientific knowledge-claims and controversies? Is it desirable or possible to generate a stable account of how to demarcate cases in which such values ground knowledge claims from ones where they distort or undermine these claims? I propose a critical theory of knowledge which assesses what political values enter knowledge-making, whether they are visible or invisible to situated actors, and how such political values gain or lose successful embodiment in epistemic or cognitive values-aims. I illustrate this critical standpoint by examining its power to represent and evaluate specific controversies in the politics of knowledge: the Challenger disaster, conflicting knowledges of "stress" in the Air Traffic Controllers' Strike and some other salient cases. I employ perspectives from philosophy of science and sociology of knowledge (SSK). One implication of my move to a critical theory is a challenge to trends in SSK that capture the

social/contextual/interest-bound dynamics of scientific judgment at the price of our losing any critical/normative/liberating standpoint.

Sophia Efstathiou
University of California, San Diego; London School of Economics and Political Science

Collapsing Multiplicity, Retaining Possibility

I am interested in the space between function and design in applications of science. Scientific theories, as other tools, have a specific design or structure and are applied to specific uses. But what about our tools makes them usable for new functions, and can a choice of design select between these unforeseen uses –or are our tools inherently up for grabs?

As a case study I discuss how multiple notions of 'race' are collapsed when the term enters different biomedical domains: public health, epidemiology and genomics. Though 'race' is commonly described as a composite biological and a social category, the variable gets traded and used as either approximating a social or a biological kind depending on the purposes (extra and intra-scientific ones) that are to be served. Multiplicity of different entities gets collapsed at various stages in this process. And this is not per se problematic. Indeed, I argue that distinguishing between social and biological notions of race, when doing our science of 'race' is necessary if one is to formally track causes of health outcomes. However, there is an interest in holding a view of the un-collapsed multiplicities in their initial state.

If what enables use is structure, and what dictates use is interest, what could advance a multiplicity of use is as much a multiplicity of interests as a multiplicity of structures: controlling use can be effected by controlling structure. As such, a view of the multiplicity of structures is a view of the multiplicity of actions.

Andrew Feenberg
Simon Fraser University

Formal Bias, Symmetry, and Stabilization

The concept of formal bias refers to the type of bias exhibited by rational systems such as sciences and technologies. A sidewalk that prevents wheel chairs from passing exhibits an intrinsic bias that can be overcome by redesign. This type of bias is different from personal prejudice. STS needs such a concept to serve as a more precise and theoretically defensible formulation of what is sometimes referred to as the "ideological" character of sciences and technologies. One expression of formal bias of particular interest is the preference for a specific type of evidence that supports a pre-established priority or program. This talk presents an example of this type of formal bias in the case of the Challenger disaster.

Martha Lampland
University of California, San Diego

The Challenge of Multiplicity to Social Theory

Feminist theorists have argued that classical (and contemporary) social theory is ill suited to analyzing the complexity of living and knowing social reality, insisting on the multiplicity of experience within social formations, and the necessarily partial conditions of knowledge. Hacking has argued that human society is characterized by an historical ontology, suggesting not only the fluidity of social process, but also its contingent and over-determined (by which I mean "multiply caused") character. Some theorists (Laclau) assert that society itself—conceived as a systemic whole—is impossible. It is the purpose of my participation to raise questions about how social theory could accommodate these complexities, i.e. refuse simplistic or reductionist structural principles or impoverished notions of human subjectivity. How can we begin to create viable theories of social action which capture the way multiplicity(s) is/are constitutive of social forms?

Aryn Martin
York University

Why Y? The Y chromosome as tool and trickster in fetal cell sciences

In this paper, I tell the story of a would-be prenatal screening technique that aims to instrumentalize fetal cells in blood samples from pregnant women. In the course of its almost 40-year history, the technique has had numerous iterations, each of which has relied on visualizing the Y chromosome as a standard or "proof of concept," and each of which has been plagued with false positives and false negatives (despite huge capital investments in the technique). Instrumental communities have relied on an absolute identity between "male" cells and "male" bodies – both of which can allegedly be indicated by a single glowing spot that lights up some portion of a Y chromosome. In keeping with the themes of this panel, I will consider investigators' dogged attempts to standardize Y chromosome markers as proxies for fetal cells, and their failures. In their conceptualization of clinical trials and experiments, fetal cell scientists take for granted that the Y is a standardizable and reliable tool. Exceptions – such as variable constitution of particular Ys, genetic chimeras, cells from previous pregnancies and intersex conditions – appear only later, as post-hoc attempts to repair the results and salvage the original concept and the tool. In other words, variations to the rule that Y=male and absence of Y=female are coded as anomalies, disallowing a (possibly more accurate) conclusion that multiplicity is the norm.

James McAllister
University of Leiden

Empiricism and the Origins of Multiplicity

Philosophical reconstructions of natural science usually endorse the claims of scientists themselves that their practices and findings are unique. In particular, philosophers have usually viewed increasingly radical forms of empiricism as an antidote to the arbitrariness engendered, in different ways, by both metaphysics and contextualism. The correct response to the prospect of a multiplicity of findings is, on a widespread philosophical view, a return to an empiricist bedrock, whether in the form of positivism, instrumentalism, or probabilism. This paper aims to show that even the most uncompromising form of empiricism conceivable does not exclude but rather generates multiplicity. I first sketch an empiricist view of science based on the identification of patterns in empirical data. I then show how the nature of empirical data ensures that any data set can be interpreted in principle in terms of virtually any pattern. I argue that many examples of good science, from cosmology to medical science, depend on the simultaneous acceptance of multiple patterns exhibited in the same data set. This suggests that, if we accept a causal relation between the physical world and empirical data, the world itself must have a pluriform structure. I conclude by considering the relation between empiricism, metaphysics, contextualism, and multiplicity in this new light.

Francoise Millerand
Universite du Quebec a Montreal

The Challenge of Standardization: How a standard became (re) stabilized when multiply enacted

This paper brings to the conversation on 'stabilizing multiplicity' an ethnographic investigation on the development and enactment of a technical standard in the ecological sciences. From a sociological perspective, we present a case study where a unique and generic standard became a set of multiple customized standard-applications in practice, going though being 'a stable off-the-shelf standard solution' to a 'no longer stable ecological standard in practice' to ultimately a 're-stabilized multiply enacted standard-application'. We argue that whereas standard development aims at stabilization through uniqueness – of procedures, practices and technologies, standardization in practice requires multiplicities to render the situated nature of scientific practices.

While the environmental sciences face an exponential increase of highly distributed and heterogeneous datasets, the need for shared standards and procedures for data transport, access, and exchange is emerging as a critical issue. The Long-Term Ecological Research Program, a network of more than 1800 researchers distributed across 26 geographically distributed research sites, endeavours to standardize its data management through development of a shared metadata standard, the Ecological Metadata Language (EML). Adopted in 2001, the standard is almost implemented through the network 5 years later. Detailed analysis of the standardization process from the development of the standard to its arduous local enactment at the laboratories and research stations reveals the active work of appropriation by local information managers. They adapted and customized the standard to fit existing local infrastructures and practices. They contributed to stabilizing the standard the moment they were able to enact the multiple standard-in practice.

Zara Mirmalek
University of California, San Diego

Grounded in Space: Opening up the Future of Multiplicity

Within the domain of the meso-level site of knowledge production, the organization, I pose the following questions: how can we imagine developing domain specific epistemology which attends to the multi-cultural constitution of the production process; how do we identify and interrogate the tendency, of humans and organizations, to resist leaving space open for multiples; and, how do these questions gird considerations for experimental work design which might interrupt the linear progression of the assumption that the future of knowledge production work must build on the past of assembly-line production?

Using ethnographic data collected at NASA, I consider these questions within an organization wherein the technological future is produced and our future is sought in the past of other planets. I consider some of the social negotiations employed in situ for managing multiple cultural backgrounds working symbiotically towards one goal and dozens of competing goals. I also consider how the technological imperative operates within a techno-scientific organization to promote the assumption that new information mediums standardize communication across cultures. This discussion endeavors to explore designing the future of multiplicity within organizational infrastructure.
END

5.9 Latin American Science and Ways of Knowing

Organizer/chair: Christina Holmes
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Scientists in Latin America face a variety of challenges contributing to global scientific knowledge. Given that scientific ways of knowing are always enacted within particular contexts, this group of papers asks how challenges to producing scientific knowledge are negotiated in Latin America? This includes such factors as the maintenance of networks and communication channels, as well as the management of institutional, technological, and epistemic challenges in order to create scientific knowledge within Latin America and by Latin Americans.

Tod Van Gunten
The University of Wisconsin-Madison

Transnational Knowledge Production: Latin American Economists in the North and South

As economic training has become increasingly prominent among policymakers in developing countries, transnational linkages between these actors and the global field of economic expertise have become more important. Since the time of the infamous "Chicago boys," a group of University of Chicago-trained Chilean economists who became instrumental in the transformation of the Chilean political economy under the Pinochet regime in the 1970's, attention has focused on how U.S. credentials translate into political power in Latin America. At the same time, these transnational linkages result in a globalized process of knowledge production. While U.S.-based expertise confers legitimacy in the periphery, cosmopolitan intellectuals can became contributors to economic debates in the core. This paper will explore this duality by analyzing the transnational ties of economically trained policymakers in Argentina. I show how the politics of expertise in Latin America is systematically linked to the global field of knowledge production.

Cristian Berrío Zapata
Université de Rouen & Paris XIII & Universidad de San Buenaventura, Bogotá

The university reform in Colombia: a contractual failure

In December 28th 1992 law 30 came to life in Colombia to regulate high level education and universities, and the activity was classified by the state as a public service of strategic importance. The law recognizes autonomy to the universities on the basis of quality, free will and opinion, and gave birth to the National Accreditation Council which is the organ that guarantees the quality level of the sector. Although these measures and intentions, the quality of high level education in Colombia does not improve substantially. One area of the problem is poor knowledge production from teachers. As a hypothesis to explain this, on the base of Michel Crozier's theory of power, it is sustained that labour and contractual conditions act as a mechanism of power that maintains teachers controlled on the base of uncertainty about stability, income and duties. On the other side, teachers respond producing adaptative barriers to such power supported on the natural difficulties implied in the control of productivity and quality in education, as the quality of pedagogic and knowledge services is difficult to measure. Teachers respond to the formalisms designed by universities to control their performance producing results that are an empty sell, so no real advances are made regarding social competences and knowledge generation. The situation reflects a blocking between universities and educators, highly incompatible with knowledge creation as the final product is a mediocre repetitive education with low innovative capacities.

Richard B. Duque
Louisiana State University

Internet Practice and Professional Networks in Chilean Science

This is a quantitative study of the relationship between
scientific networks and Internet adoption and use. I examine the diffusion of information and communication technologies (ICTs) within the Chilean knowledge production sectors addressing the following issues: what social forces have shaped Internet adoption and practice and to what extent does Internet use associate with professional networks? I offer results from a comprehensive 2005 communication network survey of 337 researchers working

in both academic departments and research institutes. I also compare findings with recent studies African and Indian scientific communities. Quantitative results confirm Chile's advanced Internet infrastructure. Diffusion of innovation(s) literature explains the profiles of those who

adopted the Internet earlier and use it with more diversity. Moreover, diverse Internet practice and international network profiles show positive and significant association. Gender though is not a factor. Counter-intuitively, those in periphery research regions report more diverse. Internet practice and international networks, contradicting previous findings.

Rossio Motta
University of California Davis

Translations of Madness: Psychiatry, Mental Health Policy and Deinstitutionalization in Peru

This paper examines how diverse actors translate biomedical knowledge and practices related to the field of mental health across power-differentiated settings. The Peruvian mental health care system is centered primarily on a handful of psychiatric hospitals catering to a population of chronically institutionalized patients. International and local groups have been denouncing this situation while advocating for a reform inspired by a global biomedical psychiatric model based on an intense use of psychotropic drugs, ensuring patients' 'deinstitutionalization'. Despite their efforts, the availability of psychotropic drugs in the local market, and a long history of biomedical psychiatric practices in Peru, this reform has yet to happen. My objective is to examine how multiple translations shape psychiatric practices and the use of scientific knowledge in Peru, ultimately preventing 'deinstitutionalization' in the local mental health system. First, I will explore how the translation of scientific knowledge generally produced in a foreign language affect the configuration of psychiatric practices in Peru. Second, I will examine how the translation of goals and motivations between different local and international actors involved in asymmetric relationships, as well as previous local histories of translations, shape the constitution of psychiatric knowledge in this country. Third, I consider that deinstitutionalization is itself one of the results of a process of translation in global psychiatry between two apparatuses that I call outer and inner asylums. Both are concerned with the regulation of mental abnormality, but differ in the types of technology/body interface that they use to achieve this objective. As such, the translation of deinstitutionalization is contingent on the existence of certain conditions also allowing the translation between outer and inner asylums.

David Barkin
Universidad Autónoma Metropolitana, Xochimilco, MEXICO

The Philosophical and Material Underpinnings for a Sustainable Alternative

Numerous social groups are explicitly rejecting their integration into the proletarian organization of production as part of the process of capitalist accumulation. In its place they are proposing and implementing self-directed social and political systems with their own productive and ecosystem management programs that allow them to determine the terms of their interchanges with the world (and regional) market economies. Using the author's proposal for an analytical apparatus to evaluate the philosophical underpinnings of actual practice by social groupings (usually alliances among communities and/or within indigenous groups), this paper applies four fundamental principles –autonomy, self-sufficiency, productive diversification, and sustainable ecosystem management– to evaluate progress made in regions attempting to implement their own alternatives to capitalist organization. The article analyzes results from two specific projects in which the author is involved as well as incorporating the lessons learned that are being applied

in other settings, including a number of projects being implemented by social actors in other geographic, ethnic and institutional settings. The study concludes that the organization of societies to build viable and attractive alternatives to capitalist models offers great scope for improving human welfare and promoting sustainable environmental management that also offers significant benefits to other segments of society living in the urban-industrial context.

Lilian Krakowski Chazan & Ivan da Costa Marques
Universidade do Estado do Rio de Janeiro & Universidade Federal do Rio de Janeiro

Domestic 'Video Sessions', Consumption and Spectacularity in an Obstetrical Ultrasound in Rio de Janeiro, Brazil

The visual inspection performed by ultrasound technologies allows for diagnosis of anomalies during pregnancy, which may indicate corrective actions or, alternatively, abortion. The acceptability and lawfulness of this kind of interference varies enormously in the contemporary world. This paper focuses on how ultrasound technologies come to produce authoritative knowledge about pregnant women, fetuses and pregnancy in Rio de Janeiro, Brazil, based on an ethnography that took place in three private imaging clinics during 2003. Negotiations in the production and use of inscriptions (images) involve the equipment, the fetus, the pregnant woman, her family, and the doctors, and configure the role of ultrasound technologies along the transformation from fetus to person in the field observed. Consumption and spectacular elements seem to perform specific and differentiating roles in support of ultrasound technologies in Rio de Janeiro: 1) frequently pregnant women bring their families to share the exam (and later at home they exhibit the video to friends and relatives); 2) the exam in itself became an inescapable consumption item in the field observed. We conclude with a non-disciplinary explanation. In a society strongly influenced by the catholic tradition, where the practice of abortion is illegal and where the cost of equipments in relation to salaries is extremely high, the gain of the diagnostic offered by ultrasound technologies would be relatively reduced by the difficulties to carry through its possible recommendations. Consequently, it comes as no surprise that ultrasound technologies juxtaposed local specific heterogeneous elements, like consumption and spectacularity to succeed its facts.

Daniel Tagle & Edith García
Metropolitan Autonomous University, México City

Resolving Environmental and Social Problems through Collective Bargaining

Latin American and the Caribbean have serious problems with their water management systems: large segments of the population in the region do not have access to clean water or sewage services and environmental problems are rife. Access to water is highly

inequitable, and the poor pay significantly more for water of distinctly lower quality; many aquifers seriously over exploited with significant levels of contamination. Our research evaluates alternative water management models in terms of equity and environmental impacts; as an example, we analyze a specific productive sector (the tannery industry) showing how a different social strategy might offer an alternative that is socially and environmentally responsible.

The analysis applies the alternative framework of ecological economics, the paradigm of the new culture of water (NCW) and the Precautionary Principle. Together, they contribute to the design and implementation of a strategy and policy for environmental remediation. However, the specific political and social conditions in each region in which we are working calls for individual strategies adapted each of them; for this reason we use a tool of analysis like Multicriteria Analysis (MCA) to define the multiple dimensions of the problem and the perspectives of each of the stakeholder groups. MCA facilitates the analysis of environmental problems in a holistic way, incorporating social, environmental and political dimensions into the decision-making process. It also explicitly includes the problem of incommensurability of values, allowing for the consideration of a complex set of evaluative criteria considered by a whole range of stakeholders. In this way, we consider the need for environmental conflict resolution into the process of strategy design and implementation.

Christina Holmes
Dalhousie University

Knowing Genetic Engineering in Colombia: Balancing Hope and Scientific Hegemony

Biotechnology and genetic engineering hold a special appeal in Colombia, both as potential to join the new knowledge economy and as a way of harnessing the country's great biodiversity. Nevertheless, new genetic engineering technology and its related knowledge production are dominated by northern interests and resources. Colombian scientists employing genetic engineering must work within this context. The novelty of the technology, however, allows many to hope that their southern focused research projects will benefit Colombia and Latin America. The way this technology is known, then, is negotiated between optimism for future potential and the global conditions in which it takes place.

Fatima Branquinho
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About inlanders fiber over the sociotechnical network of Açu's barrage: a history told by flooded rupestrian pictures

The present study try meet whether on inlander knowledge concerns over archaeologists' - and vice-versa - about archaeological sites and rupestrian art over Brazilian semi-arid.

From a polyphonic text made by these knowledge and others, what can be said about Vale do Açu's history, its small producers, about Rio Grande do Norte State (RN), and the five to ten thousand years heritaged rupestrian pictures Brazilian society? What do the pictures found on small cities stones and along Potiguara roads can say about religion, politics, and all of us? What more can the rupestrian pictures, submerged under the greatest Latin American barrage, reveal about São Rafael/RN citizens and the flooded carnauba forest? The main consequences of the description about the Açu's barrage sociotechnical network wove by inlanders' fiber translate the indissociability between content and context, between science, technology and society, farther on the contribution to fair and democratic environmental and cultural policies development.

END

5.10 Science and the Politics of Food: Negotiating Risk, Credibility, and Civil Society

Organizer/chair: Gwendolyn Blue
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Food and eating provide an illuminating lens into the ways in which scientific discourses intersect with everyday life. Although a necessary and pleasurable activity, eating also leaves us vulnerable to illness, disease, even death. As such, it is a site in which we negotiate issues surrounding safety, risk and uncertainty. Discourses and practices of techno-science have altered deeply rooted assumptions about natural boundaries, destabilizing the divides between farm / factory, animal / human, natural / synthetic. How does eating both challenge and maintain assumptions about boundaries, divisions and differences? How do we (re)establish trust and expertise as we cross over multiple layers and contexts of meaning?

Gwendolyn Blue & Melanie Rock
University of Calgary

(U. Calgary)
When 'Mad Max', the first cat diagnosed with Feline Spongiform Encephalopathy, garnered media attention in the UK in the early 1990s, public attention turned to the possibility that BSE might cross the species divide via the food chain. Although 'Max' served as an indicator that BSE was not limited to cattle populations, the pet food industry has been slow to restrict the use of bovine specified risk material. Drawing from Michel Foucault's concept of biopolitics, this paper explores representations of cats as simultaneously vulnerable to and immune from BSE like agents, and what the implications might be for broader food regulatory regimes.

Patrick Feng
University of Calgary

In regulators we trust? Risk, uncertainty, and ways of knowing in Canada's handling of BSE

Regulators must negotiate a number of issues and constituencies when developing policy responses to food outbreaks. In the case of Bovine Spongiform Encephalopathy (BSE), Canada's response has been characterized by many observers as being "measured" and based on "best science." For their part, Canadian consumers seem to agree: Canada was the first country where beef consumption did not drop, but actually increased following the discovery of BSE in native cattle. What accounts for this unusual degree of trust in

Canada's regulatory system? And what role does science play in the construction of this level of trust?

This paper will investigate questions of trust in both science and regulation. I argue that, in the case of BSE, at least four distinct groups were involved in the (de)construction of trust in Canada's food system: policymakers, scientists, producers, and consumers. And each of these groups has a different emphasis in terms of how they understand or anchor trust: through laws, knowledge, practices, or public action. In this paper I investigate how uncertainty is handled by each of these groups, how trust is created, and how these groups perceive each other's knowledge of the food system. Drawing on interviews with policymakers, scientists, and food producers, I suggest that these groups have very different ways of "knowing" that their food is "safe." Furthermore, while Canadians seem to express great confidence in their country's regulatory systems, the reasons for this have less to do with "good science" than with how policies are perceived as public action.

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Making an American Body: Markets, War and the Creation of USDA Nutrition Guidelines, 1942-2005

Government nutrition guidelines are efforts to produce a "generic" citizen body, varying only along the lines of gender, age, and pregnancy status, as much as they are efforts to promote optimal human health. Since 1885, the United States Department of Agriculture has produced such guidelines, refining them in part based on their own and others' research on human nutritional needs. Yet cultural, economic, and political ideals have also played a critical role in shaping what foods Americans needed to eat, how they were to be prepared, and in what amounts they were to be consumed. In this paper, I examine how two key quite opposite factors—fears of food shortages because of wars, and the availability of ever more forms and amounts of food that were made possible by markets engineered by states and corporations---shaped the construction of United States Department of Agriculture nutrition guidelines between 1942 and 2006. I show that the move from a smaller to a more elaborate set of guidelines was powerfully shaped not only by knowledge of human physiology, but by political and economic exigencies.

David Schleifer
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The unintended consequences of knowledge-based social movements

This presentation will be based on part of my dissertation, which examines the institutionalization of perceptions of risk through a study of food manufacturers' responses to the Food and Drug Administration's 2003 trans fatty acid labeling rule.

How did trans fats enter the American diet, and what are the implications of that story for our understanding of the relationship between social movements and knowledge?

In conventional stories about risk, corporations produce risks as side-effects of their pursuit of profits and watchdog groups campaign for exposure, litigation or regulation of risk producers. But most modern risks are only perceptible through the production of scientific knowledge, which is always uncertain and subject to revision. Diane Vaughan suggests that decisions made under conditions of uncertainty may result in retrospective designations of irrationality. My research indicates that the Center for Science in the Public Interest (CSPI) was among those groups pressuring the food industry to eliminate saturated fats in the 1970s and 1980s. Trans fats appear to have entered the American diet as a solution to the perceived risks associated with saturated fat, and CSPI may even have promoted trans fats at that time. In the 1990s, CSPI petitioned FDA to regulate trans fats and is campaigning actively for their elimination from the food system. What might be the implications of this story for other knowledge-dependent social movements if campaigns undertaken under conditions of uncertainty can create ripple effects resulting in the amplification of risks rather than their attenuation?

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Foods becoming Drugs through Knowledge

The combination of food, technology and industrial power has brought to the fore debates concerning the relationship among development, risk, credibility and civil society. This paper complements this body of scholarship by addressing another realm of the discussion: the media coverage of 'natural' foods visualized by 'bio-technoscience.'

Current media sources that report and advertise on health and health products have introduced biomedical scientists' arguments that they have found compounds which make certain natural foods healthy. This paper explicates the process in which the boundaries between natural/artificial, layperson/expert, knowledge-production/consumption are re-constructed while the way experts visualize natural foods is translated to change consumers' choice.

A case study of Germinated Brown Rice (below GBR) in Korea is considered in the paper. While consumption of brown rice has been a tradition in Korea, the emergence of GBR has engendered a new way of 'seeing' brown rice. In 1994 GBR became regarded as a healthier rice as it was found to contain high levels of Gamma Aminobutyric Acid (GABA), a major neurotransmitter with previously known health benefits. Media coverage of the GABA increase, which occurred in GBR via the sprouting as claimed by food scientists, is not only portrayed as an 'objective' scientific knowledge. This 'objective' claim is put forth as a selling point and interacts with consumers' practices. By exploring the performative narratives and practices which construct a particular hybrid of nature, science, rice, neurobiology and consumers on GBR, this paper argues

that collective translations are involved in forming a novel socio-techno-scientific network.

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A tempest in a test tube? In vitro meat and the futures of food

In the popular media, all manner of food choice has become cast as an expression of individual or communal empowerment. From slow food, local food, and organic food, these choices come enumerated in terms of economy, ecology, identity, health, animal well being, and ethics, thus recasting the idea of food as problem. Not a problem of if, but a problem of what kind, of why, of whether.

More recently, those troubled by the "problem" of raising animals for food production have found hope in a potential new technology – in vitro meat. Dispensing with the sentient part of the animal, in vitro meat promises to create animal protein using only embryonic muscle cells encouraged to grow in a suitable medium. Responses to the ethical and environmental possibilities of this technology have generally been very positive.

In this presentation, I place in vitro meat on a continuum that includes other forms of the same animal, along with human relationships to those forms. My goal is to trace out the beginnings of a schematic that arranges combinations of non-human and human systems across an axis of intention. The more intention we wish to insert into how things work, the more aspects must come under human systems, which require translations of both knowledge and energy. Aspects of the non-human system not translated are pushed out of the system. This framework, presented as "open-source," may help to recast the problem of domesticated animals in terms of vulnerability and surprise.

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Food's little black box: The FDA Nutrition Facts label as information technology

This paper examines the history of the standardized "Nutrition Facts" food label by the Food and Drug Administration in the early 1990s, an example of both science and the law in everyday life. The introduction of a universally mandatory nutrition label played a central part in the FDA's effort to respond to scientific and popular concern over an emerging national health crisis associated with unhealthy eating habits, while also addressing specific regulatory concerns regarding a proliferation of health-branded food products. The disputes that arose between different governmental agencies (specifically the USDA and FDA), consumer and health advocacy groups, expert professional organizations, and food industries over the proper content, design, and implementation of

the Nutrition Facts label reflected the high economic stakes in how food was represented and the political stakes of expanded federal government oversight. I will argue that the new label represents a scientized (and therefore reputedly apolitical) remedy to problematic trends in food production and public health data. In order to accommodate capitalist demands for flexible food production, the label proffers a modern taxonomy for classifying food (i.e. nutrition science) that reduces food products to transcendent properties divorced from their various unique production histories or their consumption contexts. In this manner, the Nutrition Facts label can be seen as an effort to transform the consumer's understanding of food by shifting their health concerns away from food processing, per se, to an abstract, process-non-specific food product.

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5.11 Growing Up Connected: Ways of Knowing through Participatory Culture

Organizer/chair: Danah Boyd
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Today's youth have unprecedented access to networked technologies that allow them to gather with others and share ideas, media, and culture. Through participation, youth are able to explore societal norms, learn how the world works, and position themselves accordingly. What has emerged is a participatory culture where individuals can actively engage with and distribute media.

With the rapid and ongoing evolution of new media, youth have more opportunities to consume media and produce cultural artifacts. These practices raise numerous questions that are crucial for STS. How does mediated participatory culture re-organize social life? What are the advantages and disadvantages of such systems? To what degree is what Henry Jenkins calls a "participation divide" emerging across generations and socio-economic status and what are the implications of this? What role does gender, race, and religion play in participation? How can society constructively support youth practices in their media-saturated environments? How does networked participation affect public life?

This session will explore a range of socio-technical practices amongst American youth in an effort to understand how participatory culture has shaped the lives of young people today. Participants will draw from various qualitative studies on American youth's engagement with networked media to examine the ways in which different practices have enriched and/or complicated the lives of today's youth.

Lisa Tripp
Florida State University, College of Information

Your Space My Tube! Youth Media as ways of knowing social activism and participatory culture

Since the 1970s, one of the primary ways that marginalized youth have had access to creating and distributing media has been through community-based media and youth development programs, often referred to as "youth media" initiatives. These initiatives have often tried to incorporate critical pedagogy and youth "empowerment" teaching methods—emphasizing media projects in which youth explore social and political issues affecting their lives, and in which youth express their ideas through a wide range of media formats and genres. This paper draws on interviews with youth media producers who have a well-established history of involvement in youth media organizations to examine how they experience being a "youth producer." The analysis focuses on the ways that youth use media production as a form of participation in activist political struggles and participatory media culture, and how they negotiate the relationship between these arenas. The paper aims to address a gap in literature and theory about

youth media that has tended to treat youth media in celebratory terms, as an instance of youth "self-expression," or more critically and dismissively, as an expression of adult-driven pedagogy. I argue that neither approach does justice to the range of ways that youth media producers use media to participate in society and culture.

Rebecca Herr Stephenson
University of Southern California, Annenberg School for Communication

I <3 Harry, therefore I am: Fangirl identity as a way of knowing

From crowds of screaming girls at concerts to the girls who create and maintain shrine websites for actors, musicians, and models, "fangirls" make regular appearances throughout the history of American youth culture. Fangirls can be easily understood and dismissed as obsessive consumers. However, in an age of participatory culture, in which identity and learning are so closely linked to cultural production, it is important to consider as well the types of production—from web shrines to fanfic to fan videos--in which fangirls engage. How does the identity of fangirl operate as a way of knowing? Further, how does this identity challenge the notion of the disempowered consumer citizen?

While the movement to online spaces and the adoption of media production as a mode of participation in fandom have created additional opportunities for participation, they have also complicated the traditional understanding of media fandom as a female space. This paper investigates the ways in which "fangirling" operates as a mechanism for girls to leverage current discourses of gender and sexuality in order to create a place for themselves within male-oriented technical milieu of video production and podcasting. With a focus on the Harry Potter fandom, this paper will draw from ethnographic observations and interviews with fans and fangirls to analyze girls' participation in fan production and to raise questions about the ways in which learning and identity development operate within this context.

Sarita Yardi
Georgia Institute of Technology

The Problem of Not Knowing: Understanding the Gap between Youths' Sophisticated

Participation on the Web and their Misperceptions of Traditional Computer Science Fields
Youths' participatory culture on the web is no longer limited to those teens that have home access to high-speed Internet connections. Nor is it dominated by stereotypical demographics, such as male gamers. Recent studies show that teenage girls and underrepresented youth comprise a core demographic of users on social networking sites and in media production and sharing environments. My studies with such teens have revealed them to be sophisticated, savvy, and highly aware users in their online worlds. In these environments, they express a strong sense of self-identity, confidence, and comprehension. Yet, when asked about their ability and interest in using computers and

technology in their future academic or professional careers, they repeatedly affirm that they "don't know a lot about computers" are "not bright" or "don't know as much as the boys."

Despite being empowered and confident participants on the web, their perceptions of computers reflect those that have been lamented throughout the past three decades about underrepresented populations in these environments. Why is there still a gap between youths' perceptions online and using computers? Are there lingering stereotypes that today's participatory culture may help to dissolve? Drawing from my surveys, focus groups, and interviews with teenagers in these environments, I will describe how growing up connected has influenced their ways of knowing and what it might mean for their futures in computer science related fields.

Patricia G. Lange
University of Southern California, Annenberg School for Communication

How Tubers teach themselves: Narratives of self-teaching as technical identity performance on YouTube

Interviews with YouTube participants often produce a familiar narrative about how they learned to manipulate technical artifacts such as video cameras, computers, and editing software. This narrative, or encapsulated story about sequences of events in YouTubers' lives, often includes the assertion that they are "self-taught." They maintain that they learned about technology on their own, ostensibly without the help of other people. However, careful analysis of a range of data reveals that: 1) participants making this claim are actually not exclusively self-taught; 2) being self-taught has myriad connotations and meanings; and 3) claiming to be self-taught forms part of a larger identity performance by YouTube participants among technically-oriented, imagined online communities. Based on an ethnographic project that combined observation of behavior on YouTube, analysis of technical artifacts such as videos, and interviews with YouTube participants, this paper argues that claims about being self-taught reflect and reify assumptions about normative ways of learning and participating in certain online milieu. As scholars of oral history have pointed out, an oral self-representation is "important not necessarily because of its adherence to fact but rather in its departure from it, as imagination, symbolism, and desire emerge" (Portelli 1991). Examining claims about participants' life events is instructive, but not because it is important to verify actual sequences of learning events in every case. Rather, such claims provide a window through which we can understand how some online participants project their identities as competent and acceptable participants in communities of technically-oriented media practice.

Sonja Baumer
University of California Berkeley

Modes of engagement, motivation and ways on knowing on YouTube

Within the framework of a larger ethnographic study on informal learning and digital media. I examined how American youths (age 18-25) engage with YouTube. My data include 60 interviews and 370 videos (responses to a question "Why do you YouTube") that were content analyzed. Among the people who are not "youtubing" for monetary or career interests, I identified three types of engagement:

1. "Doing Random Stuff" is characterized by non-selective viewing (i.e., "surfing") and a bricolage type of production that stimulates creativity and intertextuality.

2. "Ego-involved" youtubing is focused on performance, self-representation and reputation. Videos produced within this mode are largely provocative and feature authors who vlog about their lives or demonstrate "cool" skills.

3. "Interest driven" youtubing is found among people who have developed interest in a specific topic (e.g., Harry Potter, soccer, etc.) and whose viewing and video production are highly selective and centered around that interest.

My discussion is informed by theories and empirical studies conducted in the area of intrinsic and achievement motivation and academic learning. I first discuss the underlying motivational orientations behind the three patterns of "youtubing" (intrinsic, ego performance, and task/interest driven achievement motivations). I then reflect on how these motivational orientations emerge during users' interactions with(in) the YouTube media and about the potential consequences of the introduction of monetary incentives on YouTube. Finally I describe the distinctive trajectories of learning and acquiring knowledge that are associated with those motivational orientations.

Christo Sims
University of California-Berkeley, School of Information

Getting to Know You: Teens' Uses of Digital Media for the Construction of Nascent Intimacies

Developing an understanding of a peer's subjective experience constitutes an important type of knowledge for teenagers, facilitating interpersonal relationships, identity exploration, and many collective undertakings. Digital media, and the emerging conventions that structure its use, allow new ways for teens to learn about the lived experience of their peers. These new methods for authoring and exchanging subjective information are particularly useful when teenagers wish to explore the possibility of romantic relationships. Drawing on data from home visits, interviews and participant observation, my paper will report on some of the ways teens use digital media to co-produce the beginnings of intimacy. In particular, I will focus on a tendency to exchange numerous short, asynchronous, text and photo messages – both through cell phones and social networking sites like MySpace – in the initial stages of getting to know someone of possible romantic interest. I argue that these apparently casual, but carefully crafted, messages allow for micro revelations, in which neither party has to divulge much about their feelings of interest without receiving a reciprocated response. These small, but rapid, exchanges allow teens to investigate the possibility of interest without putting themselves "out there" as much as might be required in telephone or face-to-face communications. The paper draws on ethnographic field work conducted in rural northern California.

Heather A. Horst
University of California – Berkeley

Mediating the Generation Gap: Creativity and Communitas in the Digital Family

Digital media's capacity for increased interaction and participation is often heralded for its potential to reconfigure relationships between producers and consumers as well as adults and youth. While education and other class dynamics shape the particular dynamics of parent-child relationships, there are indications that the perpetuation of the 'generation gap' often hinges upon parents' lack of familiarity with technology and media. This paper examines how the generation gap is mediated by technologically-literate families in Silicon Valley, California. Drawing upon Victor Turner's notions of 'liminality' and 'communitas', I argue that parent-child engagements with media create a liminal space in which family members may come together in "a time and place of withdrawal from normal modes of social action" (Turner 1977:167). An attempt to temporarily transcend the traditional hierarchies and power relations between fathers and sons, fathers and daughters and parents and children more broadly, I explore how the creation of family websites, videos, podcasts and other endeavors often creates an intense feeling of togetherness and belonging, or communitas. By focusing upon how parents and kids construct, rework and practice this egalitarian ethos, I question the extent to which

the dialectic between media-centered communitas and normal modes of interaction may give rise to broader reconfigurations of power relations in the family and thus bridge the generation gap.

END

5.12

Topological Media Lab: Atelier, Studio, or Laboratory?

Sha Xin Wei, Canada Research Chair, Media Arts and Sciences, Concordia University
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The Topological Media Lab is a group of students, artists, scholars and engineers who are making responsive environments as experiments in gesture, distributed agency and materiality.   Although the techniques push the edges of computational media, and sensor networks, ubiquitous computing, and augmented reality, mechatronics, the motivations draw from research in performance, architecture, time-based media, movement, and installation arts. Moreover, the TML's ethico-aesthetic approach and axiology draw as much from Artaud, Grotowski, Guattari, Thom, and Alexander as from critical and literary theory.

I present the TML as an institutional oasis, as a technical milieu, as art-as-vehicle, and as a conjecture about the possibility of experimental philosophy.

6.1 Translating Latour

Organizer/chair: Roy Bendor
Simon Fraser University, Canada
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Jack Post,
University of Maastricht, The Netherlands.
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In over 30 years of academic research and publication Bruno Latour has significantly contributed to the shaping of social studies of science and technology as a viable and vibrant intellectual project. With its constructivist approach, historically grounded narratives and trademark polemical style, Latour's work is much more than an attempt to untangle the various dimensions of techno-scientific practice; it is an 'anthropology of modernity.'

As such, Latour's key concepts – mediation, translation, delegation, shifting, hybridization and assemblage – provide a vocabulary for a critical approach to modern truth-making that addresses not only science and technology but also religion, politics, law and the arts. However, in glaring contrast to Latour's own constant dialogue with various strands of the social and the natural sciences, there has been little attempt to engage with actor-network theory on a wider socio-political and philosophical terrain. The presentations in this panel address this lacuna by critically re-reading and interpreting Latour's work, drawing from a range of theoretical lenses that include semiotics, phenomenology and hermeneutics.

In doing so, the presentations gesture toward Latour's own mode of theorization by mediating, displacing, or 'translating' his work into various other research dialects and foci, creating "a link that did not exist before and that to some degree modifies the original two" (Pandora's Hope, p. 179). By critiquing, reconfiguring and expanding Latour's insights to contemporary discourses of democracy, ecology and media culture, this panel affirms the continuous relevance of Latour's work to contextualizing science and technology studies in an ever integrating, dynamic world.

Roy Bendor
School of Communication, Simon Fraser University, Canada

Latour's Techno-Political Ecology

This presentation reconsiders the ontological foundations and ethical implications of Bruno Latour's techno-political ecology.

In Politics of Nature (2004), Latour reasserts the centrality of science and technology to pursuing meaningful environmental politics. In his view, the modern techno-scientific dynamics that lead to the ossification of the nature/society (false) dichotomy can be subverted to reconstitute our relationship with our environment on entirely different

terms: instead of merely reintroducing environmental concerns into our techno-political culture, Latour argues for a radical reconfiguration of 'nature' and 'politics' to address the 'collective' of humans and nonhumans.

While Latour's appeal to ecologically reconfigure politics seems to echo earlier critiques of the modern alienation from and domination of nature, it is premised in a particular ontological construction, namely the assemblages of actor-networks that make the fabric of the modern world. In this presentation, I employ an actor-network analysis of the flows and mutual dependencies that construct a landscape immersion lab to explore the political-ethical dimensions of Latour's ontology. I argue that while actor-network theory goes a long way in establishing a substantial ecological sensibility to the (essentially technical) interactions of humans and nonhumans, it has little to say about meaning, value and potentiality – the building blocks of ethics – without which no truly transformative politics can be pursued.

Darryl Cressman
School of Communication, Simon Fraser University, Canada

Translation and A Hermeneutic Theory of Media

Generally speaking, Latour's work has come to be associated with micro-level descriptions of how sociotechnical networks come into being and how they function. As such, this approach has always appeared at odds with work of media theorists like Harold Innis (1951), Walter Benjamin (1968) and Susan Sontag (1973). Whereas Latour's work emphasizes complexity and contingency in localized contexts, these media theorists approach sociotechnical phenomenon through macro-level frameworks that emphasize history, ideology and interpretation.

Despite these differences, in this presentation I explore how these theorists can be understood as describing processes of sociotechnical translation - the ways in which the social world and the technical become inseparable, co-constituting each other as they become intertwined in everyday practices. I use the examples of photography, film and writing to describe the ways in which media translates our experience and interpretation of the world. I conclude by proposing a hermeneutic theory of media technology that conceives of translation not only as a micro-level process but also as a universal phenomenon that occurs across a variety of social and cultural contexts.

Jack Post
Faculty of Arts and Social Sciences, University of Maastricht, The Netherlands

We Have Never Been Semioticians? Reconciling Actor-Network Theory and Semiotics in the analysis of computer games

Although Bruno Latour is very explicit about his debt to semiotic theory, he is, nonetheless, very critical towards it. Latour considers semiotics a toolbox which can be

used freely to analyze such different topics as a text from Einstein, a hotel key, or the interaction between humans and guns. Despite the fact that semiotic terms such as actant, actor, shifting, reference or enunciation play a crucial role in his work, Latour reproaches semiotics for not being able to analyze typical STS research topics such as the "natural" entities of science or the "material" entities of technology.

In this presentation I would like to take the semiotic legacy of actor-network theory seriously and show that semiotics is indeed quite useful to analyzing complex technological artifacts and assemblages such as contemporary computer games. This is especially the case because in the last fifteen years semiotics has rediscovered its phenomenological roots, allowing it to address such research topics as the 'object' and the 'body'. This shifting of centers of interest places semiotics in a position to complement Latourian theory which is in fact quite limited in its capacity to help analyzing even such simple computer games like Tennis for Two.

Jean Hebert
School of Communication, Simon Fraser University, Canada

The Networked Music Subject

The networked personal computer represents a radically flexible interface/artifact for musical activities ranging from creation, performance, and recording to dissemination and listening. The configuration of this technology as a plastic, multifarious all-in-one site for musical activities transforms what we may think of as a 'musical-technical subject'.

While the vanishing boundaries between listener/creator, disseminator/receiver and agent/network have been accounted for in prior theories about the performativity of taste (Hennion 2001), the space of flows in distributed music creation (Theberge 2004) and the social construction of musical instrument users (Pinch and Trocco 2002), in this presentation I employ Latour's notions of 'translation' and 'hybrids' in an attempt to theorize the reshaping of our notion of what a musical-technical subject is.

As Antoine Hennion shows, thinking about the musical-technical subject with a Latourian frame of reference can stimulate and renew the discussion about musical subject-networks, and point the way to a new and productive vocabulary for talking about musical (and related nonmusical) subject-networks. However, some serious challenges for a Latourian perspective on technology arise as the social production of music is in some ways not comparable to the construction of knowledge. In particular, the personal computer signals an unprecedented degree of transformations of subjects, networks, and technologies, as formerly distinct groups of users (notably, audiences and creators) are reconstituted in new forms. And in general, there are also problems with shifts from micro- to macro- analyses which are brought into sharp relief when music is the central focus of study.

Peter-Paul Verbeek

Department of Philosophy, University of Twente, The Netherlands

Actor-Network Theory and Phenomenology: the Nonmodern Connection

In many instances, Bruno Latour has distanced himself from phenomenology. Even though phenomenology and actor-network theory share an abhorrence of modernism, for Latour phenomenology does not provide a truly nonmodern alternative. Its attempt to reunite subject and object – using the bridge of 'intentionality' – merely reconfirms their separation, rather than enabling a symmetrical approach of humans and nonhumans.

Yet, Latour's critique does regard classical phenomenological positions, but fails to take into account contemporary phenomenological approaches. The postphenomenological approach, which arose on the basis of the work of Don Ihde, offers a more radical alternative to modernism. Rather than bridging the gap between subject and object, postphenomenology shows how subjects and objects constitute each other in the relations that arise between them, often mediated by technology. Just like actors and networks, subjects and objects can be seen as the product of their interaction, not as its starting point.

There are important differences between the specific ways in which both positions aim to stay away from the modernist separation of subject and object, though. While actor-network theory claims that the distinction between humans and nonhumans is ultimately irrelevant, the postphenomenological focus on the technological mediation of experience requires a distinction between an experiencing subject and an experienced object, which constitute each other in their mutual relations. The paper analyzes the implications of and differences between these distinct styles of nonmodernism, by using them to investigate the mediating role of ultrasound in moral decisions regarding pregnancy.

Discussant: Andrew Feenberg
School of Communication, Simon Fraser University, Canada

END

6.2 Going Local, Knowing Global? Dilemmas and Challenges of Genomic Governance

Organizer/chair:
Barbara Prainsack
Life Science Governance Research Platform, Department of Political Science, University of Vienna, Austria
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Richard Hindmarsh
Centre for Governance and Public Policy
Australian School of Environmental Studies
Griffith University
Nathan, Australia

The current dilemma of governance is often summarized as a discrepancy between the global scope of practices and knowledges on the one hand, and predominantly national scopes of governance on the other. This session will explore what "going global" means within the field of genomics research and applications. How do research collaborations, knowledges, and identities transcend national borders? In what way do national borders impact on knowledges and practices in the field? Furthermore, to what extent do knowledges and practices of genomics generate new modes and patterns of governance in the context of globalization?

Our starting point is the conviction that in the field of genomics, the use of the term "global" tends to gloss over a wide variety of differences in terms of how practices and knowledges are organized (and organizing themselves). For example, the governance of forensic DNA profiling is driven by very different infrastructures, images, rationales, and stakes, than the governance challenges inherent in the Alzheimer´s "epidemic" among an ageing population world wide. Consequently, there is no single problem for which "good" global governance in the field of genomics could offer a single solution. This session will instead focus on the ways in which different governance dilemmas and challenges arise in different contexts of genomics. It will also explore how current dominant modes of ethicization of research and science often do not facilitate transnational governance of genomics, but rather increase tensions and disharmonies between local truths and practices on the one hand, and global claims and images on the other.

Ursula Naue
Life Science Governance Research Platform, Department of Political Science, University of Vienna, Austria

"Journeys of a lost brain": Governing Alzheimer's Disease in the genomic era

The proposed paper uses the example of Alzheimer's Disease (AD) to discuss the impact of genomics research on practices and knowledge landscapes within contested concepts of this disease. Different ways of knowing are not only different possibilities to view the

world, but at the same time give meaning to the world. Therefore, these ways of knowing represent and form power relations which establish what particular knowledges are relevant. At the same time, these ways of knowing reflect several levels and forms of governance in the field of AD, from self-governance of individuals and local practices to global governance aspects. Whereas "doing AD" can be viewed as the local and personal aspect of this disease, "describing AD" from a more global standpoint applies to transnational and collectivising practices, as e.g. genomics research. Governing AD in this context increasingly implies a mutual influence of these different practices and discourses. On the one hand, local knowledge, problems and ways of ordering this disease spread and travel globally, and on the other hand, transnational research collaborations and findings, as well as various transnational networks affect living a life with AD and the enactment of this disease on a personal and local level. Therefore, the proposed paper aims to discuss the different "journeys" of practices and ways of knowing with regard to AD and their possible impact on future modes of governing this field.

Jenny Reardon
Sociology Department, University of California, Santa Cruz, USA

The Problem of Democratization in a Time of Transnational Biopolitics

Following the stringent critiques of organizers of the Human Genome Diversity Project for excluding people from the initiative's early planning, subsequent administrators of high profile 'global' efforts to study human genetic variation, such as the International HapMap Project, have made great efforts to stress the importance of including 'the people' who are to be the objects of study in research design and regulation. Such efforts to 'democratize' genomics would appear to represent a positive development. However, in practice they have satisfied few as they fail to recognize the most basic lesson of the Human Genome Diversity Project debacle: genomics raises questions not just about the inclusion of people, but about their very constitution. Positing concrete, stable subjects in society, current efforts to 'democratize' genomics fail to recognize that entangled in the fundamental questions about nature posed by this emergent form of technoscience are fundamental questions about the order and constitution of societies. The creation of sustainable and desirable forms of governance require us to come to terms with challenges posed to liberal democratic practices and values, such as inclusion, in an age defined partially by this mutual dis/ordering of nature and society in a transnational age.

Catherine Waldby
University of Sydney, Australia

We would like to devote much time to a substantial discussion about what the terms "global" and "global governance" in the field of genomics (we include the notion of "post-genomics" in the term "genomics") mean, and what practical manifestations we can discern. We plan to ask authors to give short kick-off presentations and subsequently participate in a semi-structured discussion on several aspects relevant to our topic (a list

of questions will be prepared and sent to the authors prior to the meeting). Contributions from the audience will be strongly encouraged.

Ingrid Metzler
Life Science Governance Research Platform, Univeristy of Vienna
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Knowing the public or doing publics? Making sense of participatory arrangements in the governance of biobanks

Over the last decade, 'biobanking' has become a key practice in contemporary life science and a major topic in the emerging bio-economies throughout the western world. In a narrow sense, biobanks consist of a combination of biological artefacts, such as spliced tissues or donated blood, with medical and biographical data. In a broader sense 'biobanks' do not only link biological artefacts and data. Rather, their success or failure depends on the successful enrolment of a broad range of other heterogeneous entities, among which 'the public' ranges prominently. Regardless of whether the 'public' is conceptualized as the assemblage of present 'donors' and/or as 'patients' or 'consumers' in the future, knowing what the 'public' thinks and involving the 'public' through participatory arrangements has been recognized as key for the success or failure of biobank initiatives and has therefore been embraced as a central strategy in biobank governance.

Drawing on empirical research in major biobank initiatives, this paper seeks to analyse the different strategies and practices that biobank initiatives have tackled to make sense of what the 'public' thinks. It argues that it makes little sense to conceptualize the 'public' as a pre-existing entity and that the 'different ways of knowing the public' are therefore more usefully conceptualized as 'ways of doing publics'. The paper seeks to map the different ways in which publics are enacted in participatory practices and seeks to make sense of what difference they make.

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6.3 Sciences and Publics
    Chair: Matthew Weinstein
    Presenters: Matthew Weinstein, Claude Rosental, Zoe Nyssa, Elizabeth Shea

Matthew Weinstein
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Distorted reflections of science education and science studies

This paper examines the skewed discourses that science studies deploys in examining schools and science education and that science education deploys of science studies. At stake here are two different ways of knowing, and a parallel reification of each others discourses. First, the paper traces analysis of education in science studies from Kuhn, through Traweek, Haraway, and Toumey, each of whom addresses the role of science education relative to science. In general, this literature paints a static image of education, in which education is the "other" to Latour's science in action. For science education, science studies becomes a set of representations of science. Charged with conveying both the social nature of science and the cosmology that science presents, science educators draw heavily but selectively from science studies. The paper outlines four representations of science borrowed from science studies: science as intra-lab interaction, science as job (cum inter-lab interaction), science as enterprise (cum political economy), and science as culture (cum social struggle by extra-enterprise publics); each involving more actors and more complex socialities. Finally, the paper suggests missed opportunities for both communities. To start with the paper analyzes a dynamic missed by science studies scholars within schools towards telemetric control and "evidence based" practice. This rearticulation reconstitutes education through cultures of science. Also, this transformation has implications for science education as students are subject to these new technocratic regimes.

Claude Rosental
CNRS Paris, France
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A Sociology of Technological Demos: Going Public in Science and Technology

I propose to analyze the social conditions and uses of technological demos (public demonstrations of technological devices). My presentation will be based in particular on empirical observations I have conducted in the past years among researchers in AI and engineers in the Bay Area, as well as within the framework of major Research and Development Programs of the European Commission. I will show how demos constitute a key element in the processes that bind the making and the marketing of science and technology. In the light of this analysis, the recent development in the use of demos will appear as a historical opportunity to understand why demonstrations should not be apprehended in the limited terms of an opposition between proof and persuasion (or apodeixis and epideixis). Studying such social phenomena will also allow me to explore

contemporary forms of scientific capitalism and of demo-cratic regimes: regimes that seem to provide power not so much to the masses (the Greek demos) than to the demonstrators.

Zoe Nyssa
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Public Understanding of Science off the Contextualist Continuum: New Zoos, New Modes of Public Engagement

The deficit model of public understanding of science and its problems have received sustained scholarly attention since the early 1990s. In this model, science communication is treated as a unidirectional flow of information from expert scientists to a passive public broadly ignorant of, and even resistant to, scientific understanding. More recent contextualist models symmetrize the analysis of professional and lay understandings (both are now considered "ways of knowing"), ranging science discourses bidirectionally along a continuum of contexts. But by taking academic and mass media contexts as paradigmatic of science discourses, the contextual model cannot account for other science discourses or modes of understanding occurring "off the continuum."

Zoos represent one such "off the continuum" case. In the last quarter century, zoos have shifted their missions to emphasize conservation activities characterized by sophisticated biological research on captive and wild animal populations. The institutional transformation of zoos is complicated, however, by zoos' engagement in multiple ethical, political and environmental conflicts over the roles and statuses of animals. Zoos must address diverse publics, including visitors, donors, animal welfare organizations, and the communities around the world in which zoos' wildlife conservation projects take place. Using interviews and participant observations collected over a twelve-month period at one prominent U.S. zoo, as well as analysis of reports on zoo-based research, I argue that "off the continuum" cases such as zoos point us toward a new mode of public understanding of science in which science institutions can productively—and democratically—engage multiple publics and ways of knowing.

Elizabeth Shea
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Retelling History of Evolution; Revising Norms of Knowing

Studies in the history and historiography of science have examined the epistemic, social, and institutional exigencies that shape the tellings and retellings of histories of science. Helge Kragh and Peter Gallison, for example, have each examined the pedagogical, institutional, and epistemic purposes that become the rhetorical goals of histories. These histories, in turn, participate in the production of new scientific knowledge and in the negotiation of what constitutes normal and legitimate ways of knowing within the sciences. In this paper, I draw on theoretical perspectives from the history of science and

the rhetoric of science to examine a retelling of the history of the study of evolution in a public museum setting. I focus specifically on the way that the museum exhibit participates in the rhetorical negotiation of what constitutes normal and legitimate ways of knowing. The exhibition, titled *Darwin* and currently traveling to museum sites around the United States, responds both explicitly and implicitly to the recent resurgence of public debate surrounding the study of evolution and the definition of scientific theory. The response is evident in the "controversies timeline," in the place of the more traditional discovery timelines of museum displays, and the strong emphasis placed on the relationship between Darwin and his wife and the anguish over religion that that relationship reveals. At a public museum exhibit, the refiguring of Darwin and the history of evolution calls attention to the ways in which public controversies affect the norms of knowing. The museum site also calls attention to the influence of public rhetorics in reshaping the history of science and affirming norms of knowing.

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6.4 Technologies of Hope: Exploring Emerging Therapeutic Cultures

Organizer/chair: Annette Leibing
Université de Montreal
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Virginie Tournay, vtournay at yahoo.fr, CNRS Grenoble, France

This panel is about hope and uncertainty as social forces - two poorly explored, but important aspects of the social lives of health technologies. This is especially true regarding new technologies, which generally emerge or emerged within a heated debate of hype, hope, and fears. Hope can result in standstill, but usually leads to action in order to be fulfilled. In line with a "sociology of expectations", panelists, stemming from different academic disciplines (anthropology, history of medicine, sociology, psychiatry, political sciences), explore this moment of "not-yet". Applying their arguments to concrete examples such as stem cells, laboratory fiction, or psychopharmaceuticals, panelists show how technologies projected into possible futures become embodied and transform and structure therapeutic cultures.

Jonathan Metzl
University of Michigan

Rhetorics of Hope: Narrative Trajectories of Wonder Drugs

This paper will explore the narratives and narrative theories that surround the release of wonder drugs, and particularly wonder drugs whose benefits function at the nexus of medical illness and everyday life. Patterns of popular euphoria and disenchantment surrounding the release of the tranquilizers of the 1950s, benzodiazepines of the 1970s, SSRIs of the 1990s, and perhaps the Viagras of the 2000s, are governed by the three-phase Law of the Wonder Drug (Smith, 1985). In phase 1, an initial embrace, filled with high hopes and a suddenly fickle discontent for prior forms of treatment, is encouraged by science writers and an expectant public waiting for miracles from medicine. This leads to a period of wild enthusiasm in which the new drug is overvalued, overrequested, and overprescribed. In the process, prior forms of treatment are deemed obsolete. In phase 2, problems are discovered, and the drug is undervalued and overcondemned. The result is a fall from grace. Finally, in phase 3, stability is achieved with appropriate evaluation of the comparative worth of the drug. Resolution leads to a rational if somewhat tempered understanding of the drug's benefits, which then results in judicious long-term use in clinical practice. The paper will explore this trajectory in numerous settings, and will then contemplate its relevance within a present-day context where pharmaceutical companies claim financial hardship (Pfizer 2007) as a way of profoundly curtailing new-drug development (Angel, 2005).

Nubia Rodrigues
Federal University of Bahia

Doctors, Heroes and Monsters: An ethnography of biomedicine and politics in science fiction movies

In 1886 Robert Louis Stevens wrote The strange case of Dr. Jekyll and Mr. Hyde. The story is about a doctor, who is trying to discover a drug which separates the good from the bad in human beings. Unfortunately, the worst qualities were stronger than the good ones and the doctor became a monster. This novel became very popular and was adapted for theater, TV and cinema (more than one hundred different versions). In the past doctors in their labs would create monsters, like Mr. Hyde. Stevenson's story is a kind of witness mirroring social concerns about science as dangerous to life. But in the 1960s there was a turning point: with the Spiderman (1962), and X-Man (1963) comic books of Marvel Comics a new kind of discourse about the biosciences emerged. Those new characters were created as a result of scientific experiments, which were able to protect human beings from different kinds of threat. For example, mutations produced in laboratories resulted in superheroes dedicated to order, justice, and happiness.

In order to understand why science fiction stories like that became so popular we have to consider modern biomedical thinking and our concerns about life and death. Following E. Said (1978), we can understand science fiction as part of a discourse in the biosciences which changed our social mentality. In other words, bioscience's discourses through science fiction movies and stories fill a social imagination about life and death, our origins and paths in history.

Virginie Tournay
CNRS Grenoble

Moral statements and technical devices: some collective means for collecting medical data and for setting up medical innovation

The coordination of medical practices and their standardization feature prominently in both the social studies of medicine literature, and the publications of health care professionals. Despite the regular appearance of this issue, a clear definition of the tools of standardization is the missing link that will allow for a classification of different types of medical coordination. This presentation examines the French standardization process of contemporary non-systematic laboratory manipulations of human cells and their clinical uses in attempt to begin defining some of the tools of standardization. This standardization process has been occurring for the past 25 years, and has resulted in a body of heterogeneous medical practices that have been grouped under the generic term "cell therapy". Two salient transformations in the medical management of human cells are emphasized. This collective work is characterized by a temporal superimposition of two kinds of regulations that have gradually renewed the articulation between human

cells and the social network, despite the heterogeneity of the medical material cultures that use human cells. The objective is to highlight the properties of these regulations according to the circulation of standards and the identification of what are called the operators of standardization from which regulations are developed.

Pierre-Luc St-Hilaire and Annette Leibing
UQAM and Université de Montreal

Stem cells under the microscope of social scientists

This talk is about how social scientists talk about stem cells. After a first overview of the main arguments found I key texts, we will highlight the limits and challenges of social science analysis of stem cell research as part of a new therapeutic culture. We will look specifically at how social scientists lead with the "not-yet" of stem cell research.

Eric Montpetit
Université de Montreal

Policy learning in the midst of controversy: a comparative survey of biotechnology policy actors

In controversial sectors, policy-making can be a challenging task. Controversy comes from the polar beliefs held by policy-making participants in a given sector and the frequent concomitant scarcity of shared beliefs among the public. This situation is problematic from the perspective of policy-makers who seek to avoid legitimacy deficits. In democratic countries, Beetham (1991) argues, legitimacy deficits stem from their failure to provide justifications for policy choices along shared beliefs. In the face of controversy, one policy-makers' hope to avoid legitimacy deficits is the occurrence of policy learning. The objective of this paper is to contribute to existing knowledge on policy learning with insights derived from a survey of biotechnology policy actors.

An online survey, was sent to individuals who participated in biotechnology policy development in four countries: the United States, Canada, the United Kingdom and France. The interest of the comparison stems from differences in the degree of biotechnology policy controversies among the four countries, as well as economic, institutional and normative differences. Drawn from existing surveys, some questions allow a comparison between the beliefs of policy-making participants and public opinion. Potential respondents were invited to participate in June 2006 and the survey will be closed in December 2006. Thus far, almost 300 individuals have responded. According to a preliminary analysis, a significant proportion of policy-making participants claim to have changed their beliefs, especially about some causal relationships between policy and biotechnology. Learning, this preliminary analysis suggests, carry a potential to reduce biotechnology controversies and legitimacy deficits.

Tiffany Romain
Stanford University
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Cryonics: Theorizing Subjectivity in the Long, Long Term

This paper is based on 18 months of ethnographic research on cryonics, the practice of freezing bodies after death with the hope that someday—in the near or distant future—these bodies (or at least consciousnesses) will be revived and restored to health. "Cryonicists," those who have decided to have themselves frozen, buy a service that, like many mainstream biomedical technologies and practices, offers to extend life and "buy time." The difference is that cryonics dangles the hope of buying a lot more time—ultimately, immortality—without proof that it will work. To purchase this service, a person must make many leaps of faith. For instance, a cryonicist buys a life insurance policy to cover "cryosuspension" on the likelihood that, given enough time, humans will eventually "cure the biggest health problem of all: death." Or, many cryonicists believe their identity resides only in the neural network of the brain and freeze only their heads.

Like religions that promise an afterlife, cryonics provides an avenue for seeing oneself in the long term; however, the cryonics community vehemently grounds itself in the language and logic of science and biomedicine. This paper asks how subjects re-imagine themselves through joining the cryonics community where terms for re-labeling death abound such as "the first life cycle" and "deanimation." In this paper I ask how certain subjects are drawn into cryonics (largely white, male, American, and libertarian), and how cryonics, in turn, develops particular subjectivities vis-à-vis technology, progress, and conceptions of the self.

Discussant: Rachel Pentice
Cornell University

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6.5 Towards a Socio-Technical Understanding of Architecture and Urbanism: 1. Design Thinking: an STS perspective on architectural practices

Albena Yaneva
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The session aims at exploring the role STS can play in furthering our knowledge and understanding of architecture: what does it mean to produce a socio-technical explanation of buildings, of design practices? What kind of conceptual tools are needed to understand design thinking and visualization, distributed cognition, buildings as socio-technical artifacts, design controversies and negotiations, and the heterogeneous networks surrounding architectural projects?

The session will focus around the questions: How is architectural knowledge produced? What are the ways of experimenting, validating and demonstrating a new finding in architectural practices? Recent studies on architectural design have shown that far from being a materialization of an idea or intuition through drawings, models and plans, architectural knowledge is "obtained" in the studio through meticulous material operations (of projecting, situating, mapping, planning, testing, mocking up, scaling and rescaling, diffusing, etc.), and through negotiations with a variety of heterogeneous actors. Instead of essencializing the model, the rendering, the plan, we will rather discuss and ethnographically account what happens around these hybrid objects. What kinds of knowledge are they able to generate? What kind of groupings do they form? What kind of cognitive environments do they shape? How can we account these design operations and procedures to gain access to the forms of architectural cognition?

While contributions may cover methodological issues related to architecture and STS, we especially welcome papers, which will base their findings on empirical examples and case studies, on fieldwork in architectural offices or studies of development processes.

Steven A. Moore
University of Texas

Design Thinking, Abduction, and Transdisciplinary Action

Following Aristotle's lead, Charles Sanders Peirce argued for the existence of a third type of valid reasoning, "abduction," in addition to deduction and induction. Peirce proposed that abduction is instinctive reasoning that either generates a hypothesis for solving a problem or privileges one hypothesis over another. This paper proposes that "design thinking" relies heavily upon abductive reasoning but is not synonymous with it.

Modern design thinking is always linked to an improved future, to "the transformation of existing conditions into preferred ones" (Herbert 1969). Everyone, then, is a designer, either self consciously or by unconscious membership in social projects. It would, however, be overly simple to claim that designers think abductively and scientists and scholars think analytically because scientists and scholars too are directed toward the future, even if through the analysis of past phenomenon, and they employ abduction just as designers employ deduction and induction. The distinction is, then, a soft one of habit and preference for different kinds of knowing.

My purpose in crafting this soft distinction is not to privilege design thinking over analytic thinking, or visa versa, but to argue that scholars (who see the future through an "objective" interpretation of the past) and designers (who see the future through a "situated" interpretation of the present) need each other to solve social problems. The paper concludes with a proposal for action in which STS scholars, architects, and others collaborate as designers of a better world.

Vincent Calay
Université Libre de Bruxelles

Re-Assembling the City with Paper Architectures: the 'Capital of Europe' as Urban Design Controversies

Since the end of the 1990's, Brussels has been progressively re-assembled as the 'Capital of Europe'. This production process of a new identity for the city engages various processes of knowledge. The paper will focus on two main networks of actors (worlds of humans and non-humans) that produce assemblages of the city through this idea : the world of urban design and the world of tourism. Revisiting the concept introduced by Magali Sarfatti Larson in 1993, it will try to show that both worlds produce 'paper architectures' that still construct the 'Capital of Europe' in rather controversial ways. Firstly, an emphasis will be made on how the professional architect's tools (models, computer-generated images, scale drawings,…) are reinvested by architects and urban designers in order to politically communicate on the 'Capital of Europe' and makes it public. Likewise, the paper will examine the struggles opposing architects and urban designers as experts of the definition of what is and what is not the 'Capital of Europe'. Secondly, it will show how the political tools of public consultation are used to develop a communication policy on Brussels' European image within the world of tourism. Process that re-assembles the city in ways ravelling and opposing references to heritage, landmark, urban marketing and management and Europe's postnational or federal identity.

Yanni Loukissas
MIT, Department of Architecture

Building Simulation and Visualization through a Socio-technical Lens

Over the past few decades, computational simulation and visualization have been adopted by building designers as admissible ways of knowing. Techniques like finite element analysis, ray-tracing, and computational fluid dynamics can increasingly be found among the ways that designers make claims about structures, acoustics, airflow, and other aspects of building performance. These simulation and visualization techniques have become a new means by which designers can define their practices and compete for professional jurisdiction. If we are to develop a socio-technical understanding of building design, we should consider how computational ways of knowing are shaping new practices and professional networks.

This paper will consider both ethnographic and historical methods of uncovering these dynamics in the shaping of Arup, a global and highly technical pioneer in the field of building design. From their celebrated concrete shell structure at the Opera House in Sydney to their acoustical predictions for the Lincoln Center renovation in New York City (to be unveiled in 2008), Arup has used innovations in simulation and visualization to redefine the discourse in building design and articulate new possibilities for the field. These innovations have not only led to new designs, but also to new professional roles and relationships. In describing the extraordinary development of Arup, I hope to illustrate how such technical and social changes are intertwined. When does an innovation become a turning point in a building project, in the organization of a practice, or in the development of a professional network?

Ola Söderström
Institute of Geography, University of Neuchâtel, Switzerland

The language of creole objects

The title corresponds to a research project which proposes an analysis of cultural globalization through a study of different types of urban artefacts (street furniture, architecture, interior design) in different geographic settings. The observation on which the project is based is that more and more artefacts 'speak creole'. These artefacts are, in other words, the result of different forms of negociations between local and extra-local logics. The hypothesis of the research is that they work as resources by means of which the complexity of contemporary cultural identities are expressed and embodied.

My presentation will, first, describe more precisely the goals and hypotheses of this project. I will then discuss some methodological aspects of the research and why it is necessary, in order to fully understand contemporary architecture and urbanism, to combine STS insights into the conception of artefacts ('script analysis' in particular) with approaches stemming from cultural anthropology and geography as well as from architectural history. It is, I will maintain, necessary to step out from the architectural studio, the planning or the design agency to look not only at users' strategies, but also at the biography and the geographic circulation of artefacts and building types. I will support this claim using elements from fieldwork concerning the conception of street furniture in Switzerland, on the one hand, and the burgeoning of new architectural styles in the city of Palermo, on the other.

Sophie Houdart
CNRS UMR7535, Laboratoire d'Ethnologie et de Sociologie comparative (LESC)

Sticking or not to Realism: New Challenges for Architectural Illustrations

Since the end of the 1950s and the very technical beginnings of digitalization, computer designers aimed at reproducing the appearance of the external world with the highest fidelity. Nowadays, these techniques are mature enough to offer the possibility of a perfect realism – a realism as perfect as a photography. In the field of architecture, realism, then "hyper-realism", are still the most commonly chosen ways for visualizing a project. These last ten years, however, architectural renderings have been criticized for this ever-increasing realism and the standardization of computer models. Since the end of the 1990s, computer designers and architectural illustrators develop techniques of Non-Photorealistic Rendering (NPR). Simulating hand-drawn illustration techniques (depth of field, abstraction instead of figuration, reduction of details, color balance…), NPR introduce a change of paradigm in the way of knowing about the project: on what tensions does NPR rely if it is not necessary anymore to be realist to convince of the project? What kind of experiment about the building is this? How does the quality of an image (realist or not) affect the design process? What kind of negotiations does it initiate? How do architectural illustrators and architects work together, when the first ones "think" often quicker than the last?

On the basis of an ethnographic fieldwork in the world of computer designers I will discuss, in this communication, some of the consequences of these new techniques in the conception of architectural project.

Albena Yaneva
University of Manchester

Architectural Models: a tool of thinking, a tool for convincing

In architecture, model making denotes a way of thinking - not merely as function of architect's mind, but a set of active operations, with and upon things. Knowing a building through modelling requires continuous operations and tests in work, where any process of knowing establishes itself solely through continued research, and not on the ground of any alleged outside 'foundation,' 'premise' or 'context'. What is experienced through the model is of cognitive importance in connection with what can be experienced with the building. Holding the epistemological burden of the relationship conceptual - perceptual, of sense and understanding, physical models in design act, spark architects' imagination, and enrol a variety of other participants in design: clients, investors, potential users, political stakeholders, representatives of the city authorities, etc.

Following architects at work in two architectural firms (OMA, Rotterdam and Moshe Safdie associates, Boston), I will depict ethnographically the operations of testing, experimenting and presenting the models and will show how architects think by

modelling and engage in interactions through models. Discussing the practices of the former, I will emphasise the cognitive potential of scale models in architecture and their capacity to serve as research tool in design enquiry. Drawing on analysis of public presentations of models in the latter, I will discuss the procedures of collecting knowledge and testing "the relevant social links" through the reactions, evaluations and judgements of all participants in design.

Liam Sharratt
University of Manchester
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Calculated Fictions: The Role of Models in Architectural Decision-Making

To model is to create an abstract or actual representation of an object or system from a particular viewpoint. A model thus is a dynamic 'way of knowing'. This paper aims to explore the way in which architectural decision-making is influenced by models by using an interdisciplinary approach and specific examples from studies of the processes present in the development and use of such models. The research brings together three distinct literatures. Firstly, a debate about the institutional framing of modelling, illustrating the many socio-political forces that shape models. Secondly, a debate about ways of representing the world, for example in GIS models, will explore the technologies of description, understanding and control. Lastly, debates within the sociology of science and technology, which explore the inter-relatedness of social and technological change, and more specifically, competing perspectives on processes of architectural technical change will be considered. This paper connects research interests across many disciplines, being framed by a sociotechnical perspective, seeking to establish a dialogue between engineers, natural and social scientists. This study of the developmental processes adopted through models will encourage an active interdisciplinary dialogue. The paper will be of interest to model designers, model users, policy-makers and planners. It will help to widen the debate within the various disciplines about the role of models in architectural decision-making and so contribute to the longer-term development of architectural research internationally.

END

6.6 Pharmaceutical Ways of Knowing

Organizer/chair: Barbara L. Marshall
Trent University
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This session addresses the interface of pharmaceuticals and the pharmaceutical industry with the production, dissemination, legitimation and experience of biomedical knowledge. This interface includes direct industry influences on the production and dissemination of knowledge through, for example, the funding and 'ghost-management' of academic research, and the politics of pharmaceutical knowledge in relation to drug regulation and regulatory bodies. It also includes more diffuse impacts on knowledge, including the various strategies which create knowledgeable pharmaceutical consumers, the crafting of 'scientific facts' and knowledge claims in pharmaceutical marketing, and the manner in which drugs (either already existing or anticipated) might be understood as actants enmeshed in the production of knowledge about bodies. The papers in this session ponder a range of questions which go the heart of debates about what constitutes authoritative biomedical knowledge, the ways in which that knowledge circulates and its consequences.

Sergio Sismondo
Queen's University

Ghost-management in/of the medical sciences

Ghost-management of medical journal articles and meeting presentations is the extensive but unrecognized research, analysis, writing, editing and/or facilitation behind publications. Documents have shown that large numbers of articles on profitable drugs are constructed by and shepherded through publication by pharmaceutical companies, whose influence is largely invisible to readers. By identifying and describing many suppliers of publication planning services this presentation corroborates the evidence of those documents and makes the case that ghost-management is a common and important phenomenon. This raises interesting questions about the perceived natures of authorship and publication in medical science, and this presentation will start to address those questions.

John Abraham
University of Sussex

Politics and Reason in Regulatory Science and Pharmaceutical Knowledge

Before being permitted to put their drugs on the market, pharmaceutical companies must obtain approval from government regulatory agencies. The adoption, interpretation and enforcement of scientific standards are, therefore, crucial to pharmaceutical marketing,

and to what becomes accepted as knowledge about new drugs as they enter the market. This paper examines the ways in which pharmaceutical companies make knowledge-claims about their drugs within the regulatory process, and how regulatory agencies assess those claims, with specific reference to drug safety and efficacy. To conclude, the paper discusses how social science and STS can evaluate the robustness and political implications of various social constructions of pharmaceutical knowledge, by reference to the apparent standards and reasoning of regulatory science itself.

Nathan Greenslit
MIT

Storied Science and Strategic Knowledge: Drug Marketing and the Production of Scientific Fact
In the age of managed health care and direct-to-consumer advertising,

marketing literature commonly describes branded competition in the pharmaceutical market with modifiers like 'hyper' and 'fierce' and 'harsh'. Brand positioning for prescription drugs is similarly described as needing to be 'strategic' and 'defensive.' Scientific fact has its own unique circulation in this marketing environment. My talk will explore how marketers have evolved their own varied methods of presenting science to doctors and consumer-patients, with ramifications for pharmaceutical relationships, the ways in which individuals encounter and create experiences with medications that have assumed specific social lives as heavily marketed and advertised commodities. Marketers are concerned with carving up their target audiences in the right way, but at the same time these marketers are drawing out a theory about persuasion in American health care -- one that puts scientific fact right in the center. Drawing on content analyses of pharmaceutical marketing literature and recent participant-observation with drug marketers, I will show how drug marketers are active participants in the social construction of scientific fact, which is not simply circulated, but which must be 'storied' in multiple ways.

Paula Gardner
Ontario College of Art and Design

Big Pharma's Visual Strategies -- Selling Depression On-line

This paper argues that Big Pharma (top-grossing pharmaceutical companies) employ a "script" that works to promote depression, by suggesting that depression poses a perilous, intolerable risk to most individuals. The discourse's biopsychiatric reasoning, despite its inherent logical instability, links its disease paradigm to biotechnical recovery solutions. This paper reviews recent visual and textual strategies Big Pharma employs to pass off this tenuous script as positivistic knowledge. Specifically, the tactics encourage consumers to self-surveill everyday mood behaviors for risk—signified as insidious, lethal, and yet, manageable by biotechnology— and to translate "risk" as actual disorder. Pharmaceutical promotional strategies include: the presentation of consumer-brand science that collapses and misrepresents research on broad spectrum depression; the

reframing of conjecture and hypothesis as biomedical knowledge, the circulation of depression screening quizzes (such as the Zung scale) to consumers to self-diagnose risk; and the misuse of scales charting antidepressant effect to indicate high risk of remission.. Seminal to the script is a neoliberal logic reflecting the idealized tenets of consumerized North American society; this logic emphasizes streamlined, rationalized behaviors in consumers, suggesting good citizenship requires biotechnical solutions to productivity losses caused by mood problems. These provocative neoliberal "signs" play on the productivity anxieties of society's producing class -- workers, managers and multi-taskers--and kids, as future producers. Finally, the paper argues that Big Pharma has formed consortiums with industry and nongovernmental groups, encouraging the use of such promotional strategies to increase depression diagnosis and pharmaceutical treatment among individuals with minor mood distresses.

Barbara L. Marshall
Trent University

The Pharmaceutical Imagination in Contemporary Sexual Medicine

Widely circulated 'facts' about sexual problems suggest that there has been sea-change in medicine's knowledge of the sexual body. The marker of progress in contemporary sexual medicine appears to be the progressive replacement of psychological etiologies with physiological etiologies for sexual dysfunctions, and the development of effective pharmacological treatments is taken as evidence of success. Thus, biomedical research into sexual dysfunction is grounded by a 'pharmaceutical imagination' – the assumption that we just need to know more about sexual physiology to advance a linear model of scientific progress, which will result in even better pharmaceutical solutions. Against such a linear model, this paper draws on an analysis of both clinical research and health promotion literatures to explore how drugs such as PDE-5 inhibitors, melanocortin agonists and hormones become actants in the materialization of sexual anatomies, and probes the convergence of scientific and commercial interests embodied in the 'pharmaceutical imagination' as it links industry, clinical scientists, medical practitioners and patients.

David Healy
Cardiff University
Discussant

END

6.7 Nanotechnology
        Chair: Ali Kenner
        Presenters: Alison Kenner, Byoungyoon Kim, Karen-Marie Woods, Federico
        Neresini, Mark Philbrick

Alison Kenner
Rensselaer Polytechnic Institute
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Our Shrinking Frontier: Nanotechnology, Power, and Democracy

Fueled by crisis and the interests of power, the trajectory of twentieth century science and technology has not been guided by democratic principles or practices. Despite the tremendous impact that technological development has for society and the global ecology, citizens lack agency in governing its design. Will this trend continue with the maturation of nanotechnologies?

Three points will be kept in focus while questioning the governance and development of nanotechnology. First, technoscience is often justified with the promise of public benefit and social progress. How has nanotechnology been pitched within this social contract? Next, twentieth century research and development (R&D) expanded within institutionalized patterns of power. What are the structures and interests shaping nanotechnology design? Finally, the United States lacks strong democracy and its citizens are often absent from direct participation in policymaking. What effect does this have on nanotechnology development and what are the possible consequences?

These points will be discussed while examining the establishment of the College of Nanoscale Science and Engineering (CNSE) and Albany NanoTech Complex at the University at Albany, SUNY. How has CNSE-Albany NanoTech engaged local, national, and global interests? What are the implications presented by this research complex? Finally, how could future decisions be more attuned to the needs and experiences of "other" social actors?

Byoungyoon Kim
Rensselaer Polytechnic Institute
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Comparison of public participation in nanotechnology in the United States and South Korea

Public participation in technoscientific decision making has been a topic of importance in the field of science and technology studies since its beginning. These intellectual and practical efforts of putting democracy in technoscience have mostly been devoted to elaborating the meaning and feasibility of participation and designing effective participatory mechanisms. These participatory apparatus are generally assumed as "democratic," however the participatory practices should be considered within the

context and its political impacts also be evaluated with other policy measures associated with the apparatus.

This presentation looks into the context and the practice of public participation in nanotechnology decision making and shows how differently participation is conceived and practiced in the United States and South Korea. I intend to examine three technology assessments of nanotechnology funded by the Korea government and two participatory experiments in the States, and compare them with respect to the underlying assumption of citizens and citizenship, the institutional context, and the actual output, and investigate the 'official' understanding of citizenship and democracy in both countries.

Karen-Marie Woods
Simon Fraser University
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Politicizing Bionanotechnology

Within the last ten years there has been a growing mobilization of epistemologies, practices and resources governing nanotechnology. Nanotechnology is commonly characterized in relationship to the unprecedented manipulation of particles and molecules. It is invoked as a highly interdisciplinary project with hybrid research agendas in biology, chemistry, electronics, physics and engineering. Recently the term bionanotechnology has come into use to indicate a marriage of biotechnology with nanotechnological research agendas. Various constellations of power are tied to bionanotechnology, evident in neoliberal narratives of the technology, implicit and explicit links the technology has to the American military complex, and in the emergence of a strikingly apolitical anthropology of nanotechnology. This paper serves to underscore the tension between discourse and practice; between the imagined and the imaginable; between hegemonic promises and global relations articulating the bionanotechnological.

Federico Neresini
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When 'non expert' define and handle new technologies: the case of nanotechnologies in Italy

The paper aims to describe and to discuss how lay people deal with new technologies, such as nanotechnologies, trying to show which interpretative resources (images, metaphors, heuristics, cognitive schemas, beliefs, and so on) they use in order to make sense of them.

In this respect, the Italian situation represents a very interesting moment, since this is currently a research field that still has to draw the public opinion's attention and, as a consequence, it still has to arouse disputes.

The lack of a thorough public debate underlines the crucial importance of this phase embedded within a sort of "zero time" where it is possible to observe which interpretative resources common people deploy when they have to handle a techno-scientific "object" still hardly known and a-problematic. The importance of such an opportunity is clear when you consider that in case of moot innovation, such as biotechnologies, the analysis of attitudes has clashed with the lack of an appropriate knowledge of the situation before the public debate took on the size we know about.

The research design is based on 12 focus groups realized around Italy during the last year. The analysis of the transcriptions permits not only to show the different ways through which people are producing knowledge about nanotechnology and the fact that – at least at the moment – none seems prevailing, but also the distance between this kind of knowledge and those coming from scientific researchers.

Mark Philbrick   Nanotech Compiled
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Putting anticipatory governance into practice: An ongoing case study of
nanotechnological environmental sensors

The concept of anticipatory governance may offer an opportunity to move beyond the
polarized debate between supporters of the precautionary principle and advocates of
'sound science'. At least two elements are crucial in practice: the construction of
foresight with respect to the probable consequences of technological deployments, both
intended and unintended, and the involvement of a diverse array of stakeholders in the
assessment of technologies that do not yet exist. Both aspects present novel research
challenges, and the rapid pace of nanotechnological development indicates the need for
adaptive governance strategies.

In response to these challenges, we are conducting a multistakeholder analysis over the
course of several years, centered on the possibility of using nanotechnology to produce
environmental sensors sensitive to analytes of concern in disadvantaged communities in
urban and rural California. Phase I elicited community group desires with respect to
device capabilities and characteristics, and produced a three-tiered model for phased
deployment. Phase II, to be conducted in the summer of 2007, will explore approaches to
and attitudes towards potential risks among nanotech startups, venture capital partners,
and senior researchers. Future efforts will expand the range of stakeholders to include
local and regional government representatives and concerned citizen groups, as well as a
longitudinal return to the community organizations from phase I, albeit focusing on
risk/benefit tradeoffs. Reflective of a work in progress, the presentation emphasizes
questions rather than conclusions, and seeks to identify problems and opportunities in
integrating this research into larger frameworks.

END

6.8 Knowing Food: Taste, Technology and Skill

Organizer/chair: Heather Paxson
Massachusetts Institute of Technology
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David Sutton, dsutton at siu dot edu, Southern Illinois University

Food production, exchange and consumption, as part of a process of incorporating the non-self into the self, are typically highly morally and politically charged acts. Small-scale food production, from artisan food processing to home cooking, involves aesthetic and sensory experience as well as moral and political judgment. It is formed in the nexus of the social, the cultural and the material, involving judgment of taste, smell, feel and vision. But it is also a kind of science, dependent on specialized though wide-ranging knowledge of tools and techniques as well as the biochemical properties of material ingredients. This panel explores the making of food, food knowledge and food knowers — from artisans to regulators and from celebrated gastronomes to humble home cooks. Relevant topics include knowledge transmission, the development of skilled practice, sensory memory and processes of valuation that distinguish 'proper' or 'authentic' food knowledges. How does judgment in taste — in both physiological and symbolic senses — contribute to food knowledge and knowledge communities around food? How does the social reproduction of class, gender, religious, ethnic and national distinctions happen through contemporary food knowledges? How do human practices take into account the contributions of other actors — animal, microbial, chemical — in food production and and cooking?

Deborah Heath and Anne Meneley
Lewis and Clark College, Trent University

Foie Gras, Fowl Play: The Techne and Technoscience of Ethical Eating, or the Delicacy of Despair?

Foie gras has been banned of late in California and Chicago, a move pitting animal rights activists against restauranteurs and celebrity chefs. The debate focuses around the relative "naturalness" of foie gras production techniques. Chefs like Alice Waters of the famed Chez Panisse restaurant in Berkeley and foie gras producers aim to trump detractors' discourses of pathology with descriptions of avian physiology. They argue that the fattening of geese and duck livers to produce high quality foie gras deploys the "natural" tendencies of these birds to fatten themselves in the wild before migration.

Animal rights activists, who've called foie gras a "delicacy of despair," invoke identification between humans and their avian kin. Jeffrey Mouissaief Masson argues that because one can discern signs of intelligence, emotion, and monogamy in waterfowl, it's "unnatural" to fatten their livers in ways humans would likely find excruciating. In contrast, foie gras proponents defend the feeding tube typical of modern industrial foie gras production, so vilified by animal rights activists, by stressing differences between

the physiological characteristics of humans and those of ducks and geese. The waterfowl throat, for example, is "keratinized," composed of "fibrous protein cells that resemble bristles or fingernails" (Ginor 199:81) and the esophagus is elastic (picture a heron swallowing a whole fish). Pro-foie gras specialists invoke both techné and technoscience, not only claiming artisanal authority by emphasizing foie gras' "ancientness" (references to Pliny and Plutarch abound), but also invoking technoscientific knowledge claims about the "natural" physiological qualities of foie gras' avian hosts.

Heather Paxson
Massachusetts Institute of Technology

The Art, Craft, and Science of Artisan Cheesemaking

Cheese, a food created by the conjoined action of humans and microbes on milk produced by ruminants, is a nature-culture hybrid. In the last decade, handcrafted American cheeses, many made on farms with as few as a dozen cows or goats or a score of sheep, have mushroomed at farmers' markets, restaurants and in the media. The new cheesemakers, many embarking on a second career, hail from farm families, liberal arts colleges and the high-powered urban world of biotech and investment banking. As a rule, cheesemakers know rudimentary microbiology and are careful to avoid contaminating cheese rooms with barnyard bacteria. Yet they speak of their craft as an aesthetic experience, involving judgment of taste, feel, personal vision and what Evelyn Fox Keller might call "a feeling for the microorganisms." Based on participant-observation fieldwork on New England cheesemaking dairy farms, this paper investigates how cheesemakers, in their sanitized, laboratory-like cheeserooms and their moldy caves, identify and balance what they view as science, craft and art. Key to this is the cheesemakers' recognition of the microbial-driven agency of cheeses to "develop," "mature" and "age." Interpreting the analogies cheesemakers use to describe their own work as well as the organismic/ecosystemic agency of cheese, I consider how educational and occupational experience, gender and cheesemakers' cultural capital as consumers contribute to the body of knowledge that cheesemakers bring to this modern artisan practice.

Amy Trubek
University of Vermont

What's Good to Eat? How Notions of Taste, Place and Health Shape Food Knowledge

When humans taste food or drink, when the bite or sip rests in the mouth and then moves into our bodies, culture and nature become one, in a universal process. At the same time, taste is ultimately subjective, a sense that can never truly be physiologically shared. However, that does not mean our tasting can only be understood or explained at the individual level. Our cultural tastes ultimately shape our physiological taste experiences. Cultures create evaluative categories for individual taste experiences; these categories frame and explain every day choices about what to cook and what to eat. This paper will

use ethnographic research to explore the importance of two evaluative categories to contemporary Americans: taste and place, and taste and health. By focusing on how these categories are defined and then reproduced in people's daily lives, we can see the emerging importance of these categories of knowing to Americans' overall engagement with taste today. Examining why and how these taste categories shape Americans' interactions with food and drink can illuminate how more general cultural ways of knowing get translated into daily life, especially the relationship between aspiration (I want to eat more healthy food) and practice (I can't afford that food; I don't have time to make healthy food).

Wendy Leynse
New York University

Taste Mastery: Child Socialization and Food Habits in France

Learning to appreciate food in France means learning to make distinctions: It means acquiring a specialized vocabulary to talk about food and enough practical, sensory experiences with different types of food to be able to compare and judge foods. In this paper, I will use data from ethnographic fieldwork conducted in a Loire Valley town to analyze the ways in which a group of French children were expected to broaden their palates, begin to obtain different types of practical culinary knowledge, and gain mastery of "taste"-related talk. As I see it, these were three different but inter-related aspects of what in France is known as "l'apprentissage du goût," which one could translate as "learning about taste" or, simply, "taste mastery." Discussion of this idea as well as the word "taste" ("le goût") in France will be followed by specific examples of how children acquired such concepts through participation in food-related experiences in the school classroom and lunchroom, in the home kitchen, and around the family dinner table.

David Sutton
Southern Illinois University

Does it Really Pass from Mother to Daughter? Cooking Skills, Knowledge Control and Apprenticeship on a Greek Island

This paper explores the changing nature of everyday cooking practices on the Greek island of Kalymnos. It addresses this question: How are cooking skills, practices and knowledges being reproduced or transformed concomitant with other changes associated with "modernity"? Cooking involves a variety of culturally defined skills, including knowledge of ingredients, tools, recipes (written or oral), and evaluation of the material properties of food through different, often combined sensory modalities. It also draws on a complex combination of habit memory, imagination, social skills and environmental cues. Based on ethnographic research using filming of everyday cooking practices, I examine the point of transmission of skills and knowledge about cooking: the extent to which they are (or were in "the old days") passed on from an older generation of women to a younger generation, acquired from other sources (cookbooks, classes, television and

other media), or perhaps not acquired at all. Changing gender relations, family structures, experiences of "work" and "leisure" time, availability of new technologies, and relation to local and wider communities all shape the value placed on "traditional" cooking knowledge and techniques and the practice of acquiring or transforming such knowledge. This paper explores the interrelationship of the social, the material and the sensory through the everyday techniques and knowledges people bring to bear on the practice of cooking.

Frances Short
Independent Scholar

Who Knows About Cooking?

Cooking is generally presented as a practical activity. In much popular, academic and policy discussion, knowing cooking centres on skill, on acquiring and utilising abilities such as chopping, grilling, stir-frying, making a white sauce or cooking pasta 'al dente'. The imagery that surrounds good cooking and good cooks usually lies in technical expertise, standards to be met and success in doing so. Drawing on findings from a UK study, this presentation will argue that this is simply one way of thinking about knowing cooking. Further, it will explore how within this dominant, 'common sense' discourse, recognition and appraisal of skill / ability (knowledge) is constructed around the social value of the cook, those who are cooked for and the food produced. A sustained analysis of actual cooking practices, on the other hand, that takes into account both task-related and person-related knowing produces a very different understanding. It shows that cooking can be known in a variety of ways and contexts, that cooking knowledges can be perceptual, conceptual, organisational and emotional as well as practical, technical and sensual. Can the school cook possibly be 'as skilled' as the Michelin starred chef? By what criteria can she who regularly serves up frozen pizza, instant macaroni and the occasional batch of Betty Crocker brownies be constructed as a 'knowledgeable'? Where does the serious cook, the technical expert who can produce a perfect chocolate marquise and knows what makes for a real, authentic pizza fit into the realm of 'knowing about cooking'?

END

6.9 Learning in Online Communities of Practice

Organizer/chair: Noriko Hara
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Pnina Shachaf
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A shift in the concept of learning has been observed over the past two decades as traditional learning led by instructors in the classroom is no longer the only type of learning. Other types of learning, such as e-learning (learning in electronic environments) and learning in situ (learning while doing (Brown, Collins, & Duguid, 1988)), are now part of educational practice. Similarities in the literature and practice of e-learning and learning in situ exists.

E-learning has become popular because it allows professionals to improve their skills and knowledge while permitting administrators to increase profits without physical constraints. Research is not lagging behind, yet appropriate pedagogies for e-learning still need to be identified. The popular press tends to report a utopian view of e-learning; researchers tend to promote a positive perception; and empirical implementation studies are rare.

Learning in situ often takes place in a "community of practice" (Lave & Wenger, 1991; Wenger, 1998). The concept is widely used, but underdeveloped. Some studies examine motivators to share knowledge in electronic environments (e.g., Wasko & Faraj, 2005), yet empirical research that identifies effective implementation is scarce. A better understanding of the interactions and relationships among community members is needed (Contu & Wilmott, 2003).

The panelist will describe studies that address these gaps in e-learning and communities of practice.

Noriko Hara; Pnina Shachaf
Indiana University

Power distance in Wikipedia community

Knowledge sharing among members of this community is essential to enhance learning in situ, which improves the quality of Wikipedia. Collaboration and knowledge sharing are building blocks of Wikipedia. The number of Wikipedia articles, users, and languages expands daily, yet research about Wikipedia is lagging behind. In particular, there is a need to gain a better understanding of the interactions in the Wikipedia community

(Viégas, Wattenberg, Kriss, & van Ham, 2007). Power distance among Wikipedians has significant influences on the process of decision making, interactions, and the content of the encyclopedia. Power relations can "impede or deny access" or can "enable access" to the communities of practice (Contu & Willmott, 2003, p.285). Yet, the issue of power has rarely been addressed by researchers of communities of practice and Wikipedia. The goal of this study is to address the issue of power in this online community. Online ethnographic observation and content analysis of Wikipedia talk pages illustrate sources of power, power distance, and their effects on Wikipedians' behaviors. This study enhances our knowledge of online communities of practice and Wikipedia community, in particular; and then informs designers, moderators, and participants of online communities of practice.

Jason Nolan; Danny Bakan
Ryerson University

Songchild.org: Learning and Play Through the Sharing of Open Access Children's Music

Music is central to early learning environments, and plays a key role in arts-based education curriculum for the professionalization of early childhood educators. A growing body of research is confirming the value of music education in the early years, and that

it is efficacious in the stimulation of cognitive, verbal, spatial, fine and gross motor-skills development in children (Fujioka, et al., 2006; Royal Conservatory of Music, 2006; Upitis & Smithrim, 2003; Wainsbrough, 2006). As well, music is important in its ability to facilitate learning opportunities that support the inclusion of children with special needs, as well as diverse cultural, social and linguistic backgrounds.

Songchild.org is a pilot online learning environment under development at the School of Early Childhood Education at Ryerson University using the MediaWiki architecture. Songchild represents the development of a community of practice that extends beyond preparing educators for the profession. Our goal is to create a large multi- lingual, multicultural community comprised of educator and researchers, parents and children,

musicians, lyricists, and storytellers willing to share, mash-up, translate, repurpose and retell both music in the public domain and new compositions. The goal will be the development of integrated, cross-curricular activities in the form of lyrics that will be created by educators, students and early learners. The pedagogical approach will allow for emergent curriculum and encourage a facilitative constructivist learning partnership between mentors and students. Inquiry will be in the form of analysis of all stages of production, dissemination and use of materials in a variety of context, and the tracking of the use of materials.

Fujioka, T., Ross, B., Kakigi, R., Pantev, C., & Trainor, L. (
Cindy Xin; Andrew Feenberg
Simon Fraser University

Pedagogy in Cyberspace: The Dynamics of Online Discourse

This paper elaborates a model for understanding pedagogy in online educational forums. The model identifies four key components. Intellectual engagement describes the foreground cognitive processes of collaborative learning. Communication processes operating in the background accumulate an ever richer store of shared understandings that enable the forward movement of the conversation. The collaborative process requires a moderator to coordinate communication and learning in a group. The moderator in online education is usually a teacher who shares knowledge in the process of leading discussion. Finally, a successful discussion generates intrinsic motivations to participate which keep the discussion going. This framework is designed to bring out the complexity of online discussion and to provide a basis for advising teachers and evaluating applications and software.

Howard Rosenbaum
Indiana University

Why doesn't my system work? E-learning as a computerization movement

Rosenbaum will research that explores e-learning as a computerization movement. Making use of a concept introduced by Iocono and Kling (1996), this work assumes that e-learning systems are the core technologies around which a particular type of social movement has formed. In this case it is a movement that focuses on the use of networked information and communication technologies in higher education to deliver educational experiences to a wide range of audiences. According to Kling and Iocono, early in the trajectory of a computerization movement, there will be a significant lack of overlap between the trade and the academic discourses, particularly with respect to negative or critical findings of academic researchers, which will be missing from the former. This research adopts a social informatics perspective, using the concept of a computerization movement to analyze the academic and trade discourses surrounding the spread and use of e-learning technologies in educational institutions. Rosenbaum will report on the results of a study of five years of trade and academic literatures about e-learning technologies that sought to determine whether the gap predicted by Kling and Iocono exists. A content analysis of the relevant discourses shows that there is a considerable gap between the two discourses; this gap will be described and its implications for the continued growth of e-learning will be discussed.

André Somers
Rathenau Instituut, Netherlands Centre for Science System Assessment
a.somers at rathenau dot nl

Effects of the introduction of large scale knowledge sharing infrastructures on communities of practice

The contemporary society is often characterized as a "knowledge society", in which the production and sharing of knowledge is seen as a way to cope with contemporary,

societal challenges. Several large knowledge infrastructures are currently constructed in and funded by the European Union, in the form of complex ICT based systems with the goal to facilitate data or knowledge dissemination.

Currently, knowledge sharing is often perceived as mainly a technical problem, but we would like to call attention to the social aspects. Because knowledge sharing is understood to provide a locus for innovation and knowledge production, better understanding of these social aspects may provide insight into the circumstances required for stimulating and facilitating of this knowledge growth.

In this paper, we will focus on the impact that large scale knowledge infrastructures have on different types of user communities. How does the introduction of such an infrastructure change the work that the users are doing? How does it change their perceptions, routines and motivations? In short: how does it affect their community of practice?

Using a case-study approach, we studied the effects of a variety of partly overlapping, large scale knowledge infrastructures in the field of biodiversity in the Netherlands. This field consist of many heterogeneous communities of practice, ranging from volunteer birdwatchers, to scientists and commercial consultancy firms, and to different layers and departments of government. In our paper, we will highlight the different impacts that the same infrastructure has on these very different communities of practice.

Discussant: Elisabeth Davenport, School of Computing, Napier University

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6.10 Transvaluing Communicative Discourse: Using New Media for New Knowledge Construction

Organizer/chair: Jennifer Jenson
York University
jjenson at edu.yorku dot ca
Suzanne de Castell, Simon Fraser University, decaste at sfu dot ca

This symposium will focus on the presentation of newly developed research software that enables the analysis of audio and visual data through a communicative action model. The panel will begin with the rationale for the tool, describe its process of development, and demonstrate how it works. Each panelist will then describe and illustrate a very different kind of analysis made more comprehensively understood using the MAP tool. The session will be organized as a series of inter-related multimedia, interactive presentations that attempt to "map" divergent educational and social practices both inside and outside the classroom. The aim of this session is to encourage researchers to look more closely at everyday research practices and presumptions in which "talk and text" are privileged over other forms of communication, in order to more fully understand how meaningful knowledge is constructed otherwise.

Suzanne de Castell
Simon Fraser University

It's all happening at the zoo

This presentation demonstrates and analyzes an audiovisual record of educational interactions intended to support 'ecological literacy' in a non –formal learning environment, the Toronto Zoo. Illustrating the contradictions and tensions between the school-like practices that zoo educators have increasingly come to adopt which re-configure environmental understanding as a text-driven science lesson through a micro-analytical lens enabled by MAP, we will argue that the privileging of classroom curriculum and "teacher talk" in a non-formal setting effectively disables powerful "other" knowledges that a setting like the zoo can provoke. This paper excavates the potentialities and rich possibilities of embodied knowledge in informal learning environments which are too often buried or sidelined by the imposition of classroom-like expectations and traditional school knowledge.

Jennifer Jenson
York University

Playing for keeps

This paper examines the social interactions of girls over three years as they play console games in a lunchtime and after school "game club". An ethnographic project that makes use of extensive video documentation of girls' contextual play during the club as well as

fieldnotes, interviews and a questionnaire, situates their play as contextually and socially determined. Using the MAP software, it shows how different play interactions as girls play document not only a range of abilities and play styles but also performance of play and competition. In other words, it seeks to undermine stereotypical presumptions about girls' 'cooperative' impulses and demonstrates instead their performative attempts at playful competition, sabotage and indirect "help". This kind of detailing helps to shake lose quotidian notions and characterizations of gendered play and subverts usual presumptions about what and how girls play.

Giuliana Cucinelli
McGill University

Mapping technological literacy

This paper presents and analyzes audiovisual data from conventional classrooms, as well as from technologically-rich classrooms, which seek to promote advanced technological literacy by making extensive use of laptops. In particular, it looks at the ways in which teacher behavior and interaction with the students differs with and without the laptops. The use of MAP will demonstrate that there is a strong sense of collaborative work, sharing and exchanging of information/knowledge and gender stereotyping through behavior towards and interaction with technology. This view demonstrates differences in attention, physical mobility, interaction, responsiveness to teacher-directions, and autonomous individual learning in these class settings in a way that would be rendered invisible were "teacher talk" and "student talk" the primary analytical focus.

Nicholas Taylor
York University

Mapping gendered play

This paper will take up strong arguments recently forwarded that digital game play supports the development of a new variety of 'cultural literacy' which both advances and enriches important socio-cognitive abilities. His use of MAP will show, however, that there is a critical distinction to be made between what and how girls and boys learn from digitally-mediated social play. Recent ethnographic studies, looking to move explorations of gender and gaming "outside the box" to the actual spaces of digital play, have "read" them as sites where gendered notions of play are learned, performed, and possibly subverted. Mobilizing the MAP tool's capacity for "making commonplace scenes visible" (Bryce and Rutter 2005, p. 304) in a way that purely textual means of reporting on ethnographic research cannot, this presentation charts 2 audiovisual clips from the EGG study to locate in participants' interactions possible sites of significance in terms of how gender is both performed and subverted. These include when and how proximity between players is either breached or widened; when and how physical contact, joking, and laughter happen; and when players' gaze moves from game to each other, and vice-versa. By mapping the ways these micro-interactions are played out differently by girls

and boys, this presentation aims for a deeper understanding of the ways players learn from social gaming.

Nis Bojin
Simon Fraser University

Game-based learning: Exploring new literacies?

This paper will focus on what and how boys learn as they play commercial digital-games in an after-school all boys computer game club. It uses the Multimodal Analysis Program (MAP) to provide a multithreaded analysis of video and other media as well as to allow the 'layering' of detailed analyses of video data along a given medium's timeline and permits researchers a comparative analysis among selected coding criteria. This particular analysis will be framed in terms of James Gee's notion of semiotic domains: the distinct contexts in which crucial social practices take place, signs are imbued with explicit meanings, and in which one can be literate (Gee, 2003). This paper will pay particular attention to the literacy involved in participating in the domain of gameplay, including the linguistic and practical conventions and player-expressed knowledge of the rules, signs and meanings of those signs as acquired through interaction with the game and among their game-playing peers (Gee, 2003; Wittgenstein, 1953). Using the metaphor of the language-game, it will look at how game-club participants come to be linguistically entrenched in the semiotic domain of their play; how boys adopt conventions, accept modalities and come to learn and take part in the language-game of gameplay itself. This talk will conclude with a comparative analysis of the domains of gameplay and 'traditional' classrooms.

Discussant: Michael Hoechsmann
McGill University

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6.11 "Alternative" Ways of Knowing: the Changing Landscape of Legitimate Knowledge in CAM/IM

Organizer/chair: Ellen Salkeld
University of Arizona
esalkeld at email.arizona dot edu

How do Complementary and Alternative Medicine (CAM) and Integrative Medicine (IM) studies create opportunities for re-evaluation of legitimate 'ways of knowing'? The pragmatism of biomedical clinical research grounded in a scientific stance is often at odds with the more constructivist nature of many CAM approaches. As conflicting frameworks become proximal in practice, legitimacy of knowledge must be negotiated. This session examines various modes of privileging information in the practice and research of CAM and IM, which combine aspects of mainstream medical practice with 'alternative' approaches to clinical medicine.

Two papers analyze measurement standards of clinical research data, contextualized within expanded parameters of knowledge considered by many CAM and IM practitioners as valid sources of informed clinical practice. Sutherland et.al., present an outcomes tool under development to measure transformational change and capture whole persons outcome, while Menke discusses the positioning of classical frequentist analysis as a privileged inferential tool, and contrasts the Bayesian approach for application to IM clinical data.

Other papers contrast perceptions of scientific and non-scientific knowledge in clinical practice and self care. Wang examines the way traditional knowledge in Chinese medicine has been influenced through institutional privileging of Western scientific knowledge, and Salkeld explores IM clinical practice and competing epistemological frameworks in clinical education. Thompson and Nichter discuss the importance of experimentation and embodied knowledge as strategies for dietary supplement use in an ambiguous regulatory environment. Collectively, these papers depict a changing landscape of legitimate "ways of knowing" as CAM and IM draw increasing scrutiny from competing interests.

Elizabeth Sutherland1ND, Cheryl Ritenbaugh2PhD, MPH, Mary Koithan2PhD, Sara Warber3MD, Charles Elder4MD, MPH, Marja Verhoef5 PhD
1 National College of Natural Medicine

Developing Whole-Person Measures for CAM Clinical Trials

Many complementary and alternative medicine (CAM) systems address the whole person. Some individuals receiving CAM therapies, especially therapies that might be considered to have an energetic or spiritual component, report transformative experiences, or life-altering changes that transcend their original symptoms. To date, few empirical studies have examined whole-person outcomes beyond labeling them "non-specific effects." Reliable and valid tools have not been available to evaluate whole

person-level and transformative experiences reported in qualitative interviews.

This project combines qualitative data collected in peer-reviewed CAM research at five US and Canadian institutions, to develop and evaluate a questionnaire that measures whole-person outcomes, including transformational change. Using a well-developed series of analytic phases, we are performing secondary analyses on seven existing qualitative data sets of patient (n=122) and practitioner (n=55) reports of changes, to identify frequently reported whole-person outcomes. We will also identify characteristics and descriptors of transformational process and change as described in participants' natural language. The resulting draft instrument will undergo psychometric evaluation over the next two years in a variety of populations and CAM treatment settings.

J. Michael Menke, MA, DC, MA
University of Arizona CANCELLED

Ways of Knowing: Analyzing Inference

The kinds of design and analysis applied to data greatly influence making inferences, choices, judgments, and decisions. However, inferential science tools mostly fall under just one of several types. This is frequentist or classical analysis, which estimates parameters under some very tenuous assumptions that apply only to certain types of data, conditions, and contexts decision-making. In practice, the classical frequentist analysis has ipso facto become the standard of inference for clinical research, despite its limitations. CAM is an ideal environment to test the clash of data, beliefs, and values – and adopt inferential tools to inform clinical and health policy decision-making.

Though the "classical" frequentist approach is the most common method for data analysis, it is not the oldest, and may have evolved its pre-eminent status due to a lack of computing power until just recently. This method tends to omit subtle effect sizes and should not be used where repeated sampling is impossible. Bayes's Theorem dates back to 1763, and Fisherian Likelihood Analysis to the early 20th Century. The latter two are powerful, but lesser known tools for inference and parameter estimation must be interpreted differently, but build evidence rather than reduce uncertainty.

Perhaps just as interesting as learning about these other tools, is the compatibility of analytic results with our ability to grasp and use them. With the prime purpose of research to free the mind from preconception and up-date beliefs, there must be some vigilance for method-bias in using the wrong tools, just because they are old favorites.

Ellen J. Salkeld, Ph.D.
University of Arizona

Integrating Differential Frameworks in Clinical Medical Education

As integrative medicine (IM) becomes increasingly popular, programs to educate medical professionals in alternative and complementary (CAM) theories of diagnosis and treatment are proliferating. When multiple domains of knowledge, formerly legitimate within their own systems and philosophies of medicine come into contact with each other, a negotiation must take place regarding the value of each type of knowledge in relation to all that are under consideration.

This qualitative research examines the processes of legitimating and invalidating knowledge during patient case conferences as part of clinical training program in integrative medicine. In addition to the biomedically trained physician – fellows in the program and their mentors, participants include professions in mind-body therapies, naturopathy, manual medicine, Traditional Chinese Medicine (TCM), sleep hygiene, energy medicine, spiritual consultation and psychiatry. Based on participant-observation of over sixty (60) case presentations and interviews with the clinical fellows who completed the program, the data suggests that integrative clinical fellows evaluate information from competing epistemologies in ways that more closely resemble traditionally scientific approaches to clinical assessment. At the same time, particular 'alternative' frameworks are selected as legitimate and useful in managing complex patient cases, while other methods of understanding health and sickness are dismissed as irrelevant. This paper discusses the relationship between competing disease epistemologies and evaluation of patient health, contextualizing the discussion within case presentations to illustrate the dynamics of negotiation and categories of knowledge as applied to real world clinical practice.

Jun Wang, Ph.D.
San Francisco State University

"Knowing the Why but not the How": Knowing versus Practicing Dilemma in Contemporary Chinese Medicine

This paper explores the knowing conflicts created from the institutional changes between the contemporary and older generation Chinese medicine doctors. It chronicles the contemporary forgetting of old Chinese doctors as well as the critique of medical modernity that episodically remembers them.

For several decades, scientific laboratory research on Chinese medicine has received unusual support from the leadership of Chinese medicine institutions and of the government. Policymakers increasingly see Chinese medicine as a rich untapped resource to be capitalized upon as an opportunity for global assimilation and for the marketing of Chinese products and expertise. However, in the words of a common refrain among insiders, this process of "modernization" has produced doctors with advanced degrees who "know why traditional medicine works, yet fail to grasp how it should be used in practice." In response to this challenge, inheriting the experiences of old Chinese doctors has been a primary agenda for the development of Chinese medicine since 1980s. The

name "old Chinese doctors" only become popular and honorable when their numbers were dwindling. Yet various inheriting projects were concluded as not successful due to the conflicts between new and old knowledge and methodologies. Most of the senior doctors had passed away by the year 2000, gone with them their unique clinical approaches.

Jennifer Jo Thompson, M.A,, Mark Nichter, Ph.D.
University of Arizona CANCELLED

You just know when it's right: The climate of experimentation in 'real world' dietary supplement use.

Dietary supplement regulation in the US restricts supplement labels to 'structure and function' claims of 'general well-being' and strictly prohibits most health and disease claims. Because consumers are using supplements for a wide range of reasons, they must augment information provided on supplement labels with information from other sources. We know little about how people obtain this information, what sources of information they deem most trustworthy, and how they tailor supplement regimens to suit their purposes.

In this paper we suggest that the regulatory environment surrounding dietary supplements in the US has contributed to the development of particular 'ways of knowing' by consumers about when and how to use dietary supplements. Analyzing interview data from formative research with dietary supplement users, we observe skepticism in the way our informants interpret scientific information about supplements and trust in referrals from lay referral networks of family and friends. Most notably, some supplement users explicitly characterized their method for determining their supplement regimen as an 'experiment' in which they overwhelmingly privileged their embodied knowledge and personal experience over 'expert' sources of information. We suggest that pragmatic and ideological factors—including supplements regulation in the US—foster a climate of experimentation and, for some, the process of somatic re-education vis-à-vis supplement use. In response, we stress the need for research focusing on 'real world' supplement use—especially, patterns of supplement use in context, the network effect of supplement use, and the way information about supplements is translated and transmitted.

We would be more than happy to have additional, similar papers assigned to this session, and/or a discussant if there is one available.

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7.1 Subject/object Configurations in Transnational Circuits of ICT

Organizer/chair: Lucy Suchman
Lancaster University
l.suchman at lancaster.ac.uk
Kavita Philip
kphilip at uci dot edu
UC Irvine

References to globalization, and to the place of information and communications technologies in its constitution, frequently figure 'the global' and 'ICT' as singularities. Positioned somewhere outside/alongside the phenemona of interest, dominant discourses imply that it is the range of distribution of information and communications technologies, and the variety of local appropriations, that are in need of documentation and explanation. Inspired by insights from poststructuralist, feminist and postcolonial STS, this session asks instead how specific technological assemblages and locations are constituted, inhabited, and enacted as related sites within a transnational technoscientific network. The sites considered include software workers and entrepreneurs in South Asia; Japanese and South Asian projects in robotics, bioinformatics and medical transcription; distributed associations of wireless internet activists; a Silicon Valley research lab mapping its futures; and circulating discourses of ICT for development in North and South. Within and across these sites, particular cultural/historical configurations of persons and things are variously reiterated and transformed. Technological ways of knowing are respecified through these papers, from knowledge that travels to the lived work of differently located persons and things, including the work of their identification and recognition as participants in making contemporary technoscience.

Adrian Mackenzie
Lancaster University

Generating global wirelessness: from GeekCorps to Google in Abuja

How do people represent, carry out and combine globally-oriented technical, political, ethical and commercial actions through and around wireless networks? This paper discusses several projects based around building and managing wireless networks in developing countries or for disaster relief. The paper analyses how wireless activists ('geek activism'), NGO's and business partners engage in developing wireless networks in India, South-east Asia and Africa. It suggests that these networks create forms of global awareness and enact participation in global civil society in ways that allow technologies to overflow (Callon) their conventional locations. Drawing on global civil society literatures and recent network theory, the paper analyses how hybrid civil rights /commercial wireless networks generate events that create feelings of transnational relationality.

Kavita Philip
UC Irvine

Emancipating technological subjects: Notes on India's Location in Transnational Information Technology Networks

India currently has over 25 million Internet users, mostly in its urban centers. E-governance has become a buzzword, and is pursued most aggressively by the southern states (Andhra Pradesh, Karnataka and Tamil Nadu.) The south Indian software industry workforce is about 25% female, and the less specialized information technology-enabled services industry has about 66% women. Most sociological studies ask questions such as: are developing countries liberated by information technology? Are women empowerd by the digital revolution? Rather than see technology as the driver of social, economic and political change, this paper sketches a more complex analysis of information technology in developing societies.

Susan Elliot Sim
UC Irvine

Planning vs. Improvisation: Conflicting World Views in Software Interoperability

Software engineering is concerned with constructing large software systems in the service of human activity. It has its roots in computer science, mathematics, and engineering, and as a result the conventional approaches have attempted to use logic, control, and planning to tame complexity. This approach is evident in traditional process models, such as the Waterfall model, which emphasizes an orderly sequence of events, contingency planning, and careful specification. In recent years, approaches such as Open Source software and agile software development have challenged this view. These approaches have relied on human relations, improvisation, and negotiated conventions. The dichotomy in two approaches is evident in new methods for reusing and combining existing software into new systems. Software engineering research is focused on "service-oriented architectures" as a means to prescribe, plan for, and control interoperability between software systems. In contrast, the global community of software developers is creating "recombinant software" using Open Source systems as components that are held together using wrappers and glue code.

Don Slater
London School of Economics

'Knowledge of' versus 'knowledge through' ICTs in development discourse

Development discourses persist in depicting ICTs as world-historically transformative, ushering in 'information ages' and 'network societies'. However, while envisioning a transformation of the world through new technololgies of knowledge flow, there is almost total silence as to how ICTs could, or should, transform knowledge itself,

including the knowledges involved in development practice. This is even more surprising given that the development industry itself depends to an extraordinary extent on online networking and online publication, as well as online communications to manage their transnational enterprises. This paper explores the paradox of ICTs in development practice: while 'knowledge of' ICTs involves transformative visions, the flow of 'knowledge through' ICTs in development is understood more or less as business as usual (just faster and less of a hassle). This paradox reflects a kind of core-periphery division: northern knowledge is transformative; southern knowledge is purely instrumental.

Lucy Suchman
Lancaster University

Mapping global technoscapes as a parochial project

It is by now a commonplace that representations are not simply descriptive, but also generative of the realities that they posit. This paper considers a particular representational genre – the strategic diagram – that aims to map lines of power and knowledge as recognizable presents and imaginably habitable futures. More specifically, I explore the landscapes delineated within an organisation dedicated to positioning itself as central to inventing technology futures within the global imaginaries of entrepreneurial capital. More than the accuracy or even efficacy of such diagrams with respect to the technoscapes that they project, my interest is in the micropolitics of their genesis and use in situ, as an obligatory form of local self representation. My aim is to investigate for this site the premise that "knowledge of the map is knowledge of the world from which it emerges" (Wood 1992: 18). Like other maps, moreover, depictions of the technoscape are not simply aids to navigation through an already-existing terrain, but propositions for a future within which relevant subjects and objects can claim their place.

Joan Fujimura and Amit Prasad
University of Wisconsin and University of Missouri-Columbia

Transnational "Laboratories": Encountering Nations, Economies, Gender,

This paper will locate Japanese robotics/bioinformatics/systems biology and South Asian medical transcription within a network of relations among actors, laboratories, companies, national governments, national and transnational economies, genders, and histories. It will explore the complex relations and multiple locations of ICT work and then use these

explorations to examine postcolonial, transnational, feminist, and political economic theory. It will analyze socio-economic-technical facets of robotics/bioinformatics and medical transcription and show how these are sites for the emergence of not only new technosciences but also

hierarchical subjectivities/ subject positions and citizenships. It will also compare these

studies with the questions that motivated previous lab studies using ethnomethodological, symbolic interactionist, ANT, SSK, or cultural anthropological orientations.

Morana Alac
UC San Diego
alac at ucsd dot edu

Enacting Subject-Object Formations in Robotic Technology Design

This paper grounds the question of subject-object formations in an ethnographic study of a Japanese laboratory involved in research on social robotics.. In particular, the paper concerns the dynamics of emobided semiotic engagements in the work of the laboratory's practioners. The attention to local dependencies between robotic and human bodies recovers the ways in which robotic bodies are enacted and sustained by human labors. At the same time the paper also deals with the contingent character of the knower's position and her/his embodiment. Through moments of design practice the human body is oriented to, partitioned, mechanized, and felt so that it can be known and can know.

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7.2 Civic Epistemologies and Mediated Science

Organizer/chair: Joan Haran
CESAGen Cardiff University
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The session examines a multiplicity of cultural resources that are available for publics to draw on for making sense of scientific truth claims about cloning and stem cell science. These include personal contact networks, news in the press and on television, television dramas and drama-documentaries, cinema and fine art. It draws on a range of research methodologies, including comparative analyses, focus group work, interviews, ethnography and the unique UK-based Mass Observation archive.

These cultural resources, and the specific uses made of them by a cross-cultural sample of audiences and publics, are discussed within a conceptual framework that articulates the concerns of STS scholars regarding the making and adjudication of scientific truth claims, with those of media and cultural studies scholars preoccupied with the material circumstances in which people 'engage atively in their uses of cultural artefacts in making sense of their own and others' lives' (Gray 2003).

Joan Haran
CESAGen Cardiff University

Civic Epistemologies and the Culture Industries

Sheila Jasanoff argues that: 'how publics assess claims by, on behalf of, or grounded in science forms an integral element of political culture in contemporary knowledge societies' (Jasanoff 2005: 249). She coins the term 'civic epistemologies' to signify the shared cultural understandings of the ways in which credible knowledge claims are articulated, represented and defended. However publics' cultural understandings of cloning and stem cell science are not arrived, nor do they cease with, a rationalist weighting of knowledge claims in the political domain.

This paper will set out a conceptual framework that articulates the desire to take seriously the multiple ways in which 'lay' subjects construct knowledge about and make meaning of cloning and stem cell science. It will offer a textured exploration of multiple sites of mediation, across a range of genres, as well as within academic research. It will examine the different ways in which people in a range of international cultural settings construct, negotiate and operationalise civic epistemologies and will further investigate what else is at stake for such publics, beyond the adjudication of scientific truth claims.

The session to follow will examine the multiplicity of resources that people draw on for making sense of such claims including personal contact networks, news in the press and on television, television dramas and drama-documentaries, cinema and fine art. Of particular interest is the way in which publics and audiences co-constitute science fact

and fiction, as well as those areas in which they are prepared to accommodate ambiguity or ambivalence.

Kate O'Riordan
Media and Film Studies, University of Sussex and CESAGen, Lancaster University

Global Civic Epistemologies: Genes, genetics, cloning and Mass Observation in the UK

This presentation examines the results of a Mass Observation directive on the meaning of genetics and cloning. In 2005 we asked Mass Observation respondents how they know about genes, genetics and cloning. We had ninety respondents who wrote back in relation to this question, some in detail running to several pages, some with a few sentences. Mass Observation directives have been issued continuously since 1981, and although the constitution of membership has shifted over time, these respondents are used to being asked to write about their everyday life, behaviours and thoughts.

Analysis of these responses shows that that knowledge about these topics is drawn from two different sources, narrated as personal experience on the one hand and (more dominantly) mediation on the other. Respondents discussed a wide range of texts, attitudes and experiences which we discuss in this presentation in the context of civic epistemologies. Ways of knowing, or epistemologies, structure scientific, and so called 'lay knowledge' in different ways. Jasanoff argues that whilst the epistemologies of science are constructed through a global community they are practised in relation to specific civil epistemologies, varying with the culture of the nation state (Jasanoff, 2005).

In this presentation we examine this notion of 'culture', and how the concept of civic epistemologies in relation to Mass Observation, can help to make sense of the kinds of knowledge construction operating, and the interactions between fact and fiction, in the UK context, in relation to genetics and cloning.

Maureen McNeil
Institute for Women's Studies and CESAGen, Lancaster University

Bio-art and/as public engagement

This paper will be an attempt to engineer an encounter between bio-art and debates around public engagement with science. This will include a brief review of the conditions for the emergence of both of these complex responses to recent technoscientific developments in the Western world. The first part of the presentation will concentrate on bio-art, highlighting some of its manifestations but extending this into a more analytical assessment of reasons for the recent interactions between fine art and the bio-sciences. The second part of the presentation will scan more familiar territory (for STS audiences) – the initiatives around 'public engagement' with technoscience in the early twenty-first century.

The final component will be an effort to chart convergence and divergence: Where and how do these movements meet? In what ways are they complementary? In what ways are they divergent, indeed, antithetical? Does this matter? I am interested in considering these movements together to highlight their significance in opening up the bio-sciences to a larger public. However, I want also to consider questions of cultural capital that are sometimes obscured but are crucial in both of these movements. My discussion will also consider the impact and limitations of these movements in socially and politically reconfiguring and remaking the biosciences.

Jenny Kitzinger
JOMEC and CESAGen, Cardiff University

The myth of the Frankenstein myth: debunking the 'Science Fiction' explanation of public concerns about science

Establishing the difference between 'science facts' and 'science fictions' is a core boundary management activity of scientists and policy makers. As part of this process they routinely present science fiction as negative threat – misleading a gullible public and misrepresenting science. Disquiet around human cloning, for example, is sometimes presented as a consequence of viewing too many horror films. At first glance there is ample evidence that fiction often highlights potential dangers and our own focus groups discussions about stem cell research were frequently populated by references to films such as 'Boys from Brazil'. However, the argument of this paper is that such references deserve to be treated with more reflection than they usually receive. Close analysis of everyday talk reveals that sci-fi may both reflect and resource people's imagination about science, but that 'real' events are then mobilized to underwrite and contextualize such concerns. This research also shows how 'sci-fi' may actually project an image of technological progress and even the monstrous Frankenstein can be linked to a discourse of science as a healing technology. The paper concludes by arguing that when policy makers dismiss 'Frankenstein fears' they are failing to engage with the tensions within their own discourse around scientific progress or address fundamental questions raised by public concerns.

Grace Reid
JOMEC, Cardiff University

Replicating opinions? Cross-cultural responses to TV drama about human cloning

This paper explores how audiences relate to and engage with the genre of docudrama. It focuses on a case study of the BBC drama-documentary If…Cloning Could Cure Us – which used a combination of documentary interviews and fictionalised courtroom drama to explore the potential uses of human cloning in stem cell research and future medical treatments. My research combines detailed analysis of the programme with 20 focus group discussions exploring how viewers used the programme to construct understandings of science and appropriate public policy responses. Focus groups were

conducted both in the UK and Canada, and in each country included both "general public" and "interest" groups, with interest groups consisting of religious groups, research scientists and patients who might potentially benefit from human cloning. My research looks at how the different contexts in each country (e.g. public policy differences) affect audience reception as well as how different social networks interpret the same media messages. It also explores how audiences negotiate fact/fiction boundaries in their understandings of science. I conclude by reflecting on what these findings mean for the docudrama genre generally, and particularly the use of the genre in the field of science communication.

Fiona J Coyle
CESAGen, Cardiff University

Virtual Publics: 'discourses about the public' in relation to stem cell research'

Until recently, the term 'the public' was unproblematically utilised in policy construction, media reporting and research. Further to this, conceptions of a monolithic 'public' dissolved into notions of 'publics' as 'active, knowledgeable, playing multiple roles, receiving as well as shaping science' (Einsiedel, 2007:5). However, as Einsiedel suggests, these constructions of rational individuals who construct knowledge and ignorance via judicious calculations or by optimizing purposive behaviours, are arguable. Rather, they disguise the everyday complexities, muddlings and learning experiences of human subjectivity that colour our relationship with scientific endeavour.

In this paper, I present the results of a critical review of English-language perspectives on public engagement with stem cell research. More purposefully, the focus is not on what these publics think, but how people as 'knowers', who have emotional ties to scientific developments are researched, talked about and documented. Specifically, I discuss the manifold ways in which publics are geographically categorised and under what circumstances, how they are conceived by the particular research methods adopted and how these mediums represent publics in their outputs. Namely, how are publics who talk about stem cells characterised as citizens, voters, religious persons, potential embryo donors and patient advocacy groups? How have these sub-categories of public been conceived, represented and mobilised both in public discourses and discourses about the public in relation to stem cells? What kinds of publics are fashioned by particular research methods, their geographical frameworks and temporal mappings of 'stem cell talk'?

Discussant: Brian Wynne
CESAGen, Lancaster University

END

7.3 Visions of Nanotech: Fault Lines in Knowledge and Meaning

Organizer/chair: Chris Toumey
University of South Carolina
Toumey at sc dot edu

Knowledge and meanings of nanotechnology are high problematic because nanotech is a very diffuse body of scientific knowledge, practice and meanings. In addition, nonexpert attention to nanotech is rudimentary. In these conditions, visions of nanotech are highly variable. Sources include science, science fiction, media interpretations, pre-existing cultural meanings, government agendas, interest-group ideologies, and other elements. From those sources come multiple forms of knowledge and understanding. This brings us to a classical hermeneutic situation in which nanotech means different things to different groups. At an academic level, this situation is very interesting, but it may also be troublesome if the fault lines of knowledge and meaning have serious consequences for science, policy, funding and public engagement. For this session we explore the problem by presenting sources, processes and forms of knowledge and meaning about nanotech, and then try to elucidate the consequences.

Toby TenEyck
Michigan State University

Nanotechnology in the News: 1980-2004

According to Hewlett-Packard (HP) advertising, nanotechnology offers the potential of making a cell phone small enough for an ant to use, and computer chips the size of a wristwatch which could contain every book ever written. Are these, however, real promises of an exciting new future, or another hollow endorsement about a new technology parallel to Lewis L. Strauss's proclamation that nuclear fusion energy would be too cheap to meter? The aim of this paper is to investigate the promises and concerns with this new technology as these have been presented in the press and popular culture (e.g., Michael Crichton's Prey). Beginning in the 1980s, we conducted a Lexis-Nexis search of all news items dealing with this technology through 2004, to gain a sense of the ways in which this technology was being presented on a public stage. We found that a large majority of the news portrayed nanotechnology as progressive science, as well as an economic stimulus for investors in technology.

Dietram Scheufele, Elizabeth Corley, Elliott Hillback, Tsung-jen Shih, Sharon Dunwoody & David Guston
University of Wisconsin

Nano Attitudes Among Scientists and the Public

Nanotech is slowly emerging as a visible issue on the public agenda, with scientists and the public struggling with regulatory issues and policies. We examine public opinion

surveys with random samples of nano scientists (N=400) and the general public (N=1,000) in order to compare scientists' views and public attiudes on regulation, risks and benefits, and various policy and funding proposals surrounding nanotechnology. These data are interpreted in the larger context of the media climate between 1980 and now, based on a large-scale, longitudinal content analysis of news stories about nanotechnology.

Jacqueline Luce
Zeppelin University

'Enabling' nanoscience and nanotechnology: Speculations on 'converging technologies' and scientific convergence in Germany.

The 'converging approach' and the concept of 'converging technologies' has in many ways been institutionalized within European Union funding programmes, appearing in the titles of foresight documents, calls for proposals, and conferences. Within this process of institutionalization are varied representations of the role of nanoscience and nanotechnology. While the articulation of 'converging technologies' and initiatives focused on supporting nanoscience may appear quite similar in descriptions of research initiatives, there is at times a recognisable absence of reciprocal language use or cross referencing between the documents. Drawing on fieldwork being conducted in Germany, one of the leading European investors in nanoscience research, this paper explores the configuration of nanoscience and nanotechnology as 'enabling' and examines its relationship to the 'converging technologies' concept. What are the practical, pragmatic, everyday experiences of scientists with the current images of and investment in nanoscience and nanotechnology? How do scientists acquire and disseminate their understandings and knowledge of 'work at the nano-scale'? How is the history of nanoscience, as well as its future, imagined and concretised through practice? Integrating interviews, observations and document analysis, this paper aims to foreground the multi-sitedness of the nanosciences and nanotechnology, tracking apparitions in scientific practice, policy documents, industry ventures and public space.

Brigitte Nerlich
University of Nottingham

Powered by Imagination: Envisaged & Visionary Functions of the Nanobot.

This paper explores images of nanotechnology, especially the nanobot, stored at SPL (http://www.sciencephoto.com/) in order to determine how science and imagination interact in the nano-realm. Images used in nanotechnology have attracted increasing research interest on both sides of the Atlantic. Chris Robinson and colleagues at the University of South Carolina (http://nsts.nano.sc dot edu/imagery.html) have, for example, distinguished four classes of images: schematic, documentation, fantasy, artwork. The boundaries between these classes are obviously fluid, as art and artistic conventions influence the images used for documentation and as fantasy conventions

influence artwork. This paper explores this interpenetration and draws out some ethical implications for emerging technologies. It is based on a quantitative and qualitative study of the images of nanorobots deposited at the SPL, the world's leading provider of science photos. It provides: a breakdown of the artists; their products and artistic background; a frequency and cluster analysis of keywords: and, an examination of the illustrations, including the distributions according to utopian vs. dystopian and medical vs. military visions, the variety of nanorobots, their visual appearance, the functions that they are supposed to fulfil, the landscapes against which they are projected, and the animate and inanimate objects used as models. The aim is to investigate the artistic, cultural and visual conventions and metaphors employed, the expectations and visions that are created or engineered, and the ethical implications this might have.

Rosalyn Berne
University of Virginia

Family Life: A Nano-Future Tale.

This is a short story about social-ethical implications arising from the development of nanotechnology, and its convergence with bio- and information technologies. Each new technological era is ushered in on claims of great promises and hopes, along with competing expressions of concern and alarm, doubt and disbelief. And, nearly always, new technological eras are propelled by futuristic dreams, fantasies, and ardently stated human values. What will come of the great proclamations being made about the material and economic gains of nanotechnology? What will be the actual results of current commitments and its ramifications to society? What will it mean to human life if the development of nanotechnology comes to fruition? There is moral significance in the imagined possibilities, in beliefs and visions, and especially in the promises for new ways of living reflected in nanotechnology initiatives. As a catalyst for the moral imagination, science fiction offers a medium for reflection about the ethical implications of nanotechnology. Projecting beyond accepted fact or theories, science fiction stories remind us that the orderly universe can be exposed and exploited by rational endeavors, and that human beings can change reality. In science fiction, everything is open to modification. In its essence, it projects into contexts that are at variance with what is now taken to be basic, and depicts the consequences of counter suppositions. This is a reflexive morality tale to incite imaginative exploration about what nano-bio-and information technology convergence may mean to the nature of family life.

Chris Toumey
University of South Carolina

Dialogues on Nanotech

There is a great deal of talk about the desirability of "public engagement" and "democratizing nanotechnology," but if nonexperts are going to have active and constructive roles in nanotech policy discussions, then one-way communications from scientists to nonexperts will have little or no value. Instead, the policy roles of

nonexperts ought to be nurtured in dialogues between scientists and nonexperts so that communication takes the form of two-way exchanges of knowledge, values and concerns. Columbia SC is a locus of several forms of dialogues on nanotech by virtue of a research group which is dedicated to nanoliteracy beyond the university. It is hoped that this strategy will enrich confidence and knowledge for nonexperts so that they will claim active roles in nanotech policy. This presentation explains the justification for this approach, it describes the programs, and it draws insights from those experiences.

Regula Valérie Burri
Collegium Helveticum, ETH Zurich

Evaluating emerging knowledge and risks: debating nanotechnology in a Swiss citizen panel.

Public discourses on emerging technologies involve the interplay of different ways of knowing. Similarly, the public assessment of emerging knowledge and risks associated with nanotechnologies draws on both scientific expertise and lay knowledge. Scientific knowledge has not stabilized in an early phase of research and development of new technologies, which makes it a special challenge for upstream public engagement. Nevertheless, the consensus that the public should be involved in deliberative discussions and assessments of emerging technologies at an early stage of research and technological developments is a widely shared concern among governmental and nongovernmental stakeholders. Several focus groups, citizen juries, and other discussion groups have thus been organized to explore public opinions on nanotechnologies in a variety of countries over the past few years. In Switzerland, the Centre for Technology Assessment (TA-Swiss) organized such a citizen panel in fall 2006. Drawing from an ethnographic study of this panel called 'publifocus on nanotechnologies, health, and environment,' this paper looks at the ways people deal with the epistemic uncertainty in their deliberation of new technologies. By exploring the statements of the participants in the discussion groups, this paper reconstructs the narratives that constitute the epistemic foundations of the participants' evaluations of nanotechnologies.

Discussant: Otávio Bueno
University of Miami

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7.4 Engaging Whom? Intervention-Oriented Investigations into R&D and Policy

Organizer/chair: Erik Fisher
Arizona State University
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Recent international science policies have mandated interactions among social scientists, publics, techno-scientific researchers, and other groups of stakeholders regarding emerging technologies like nanotechnology. These mandates emphasize the impact that such interactions are intended to have on policy mechanisms such as decisions. STS researchers are responding to this call in a variety of ways, and with differing degrees of observation and participation—as well as with skepticism.

This session seeks to present and interrogate emerging endeavors of this sort with respect to the following questions: Is STS research likely to play an effective role in enabling engagement, whether by (ex ante) inquiry, (ex post) assessment, or actual conduct of engagement activities? To what extent do these investigations necessitate or preclude intervention within the very contexts they study? What are their implications for policy, socio-technical outcomes, and the status of STS research itself?

The capabilities and roles of STS in respect to these questions are particularly intriguing, given the fact that some STSers have been emboldened by the idea that they have something to contribute, and hope to shape—or at least frame—technological development agendas, capabilities, or outcomes.

This panel will present a selection of intervention-oriented research—varied according to strategy, population, and proximity to engagement—that includes facilitation of public engagement, co-construction of socio-technical scenarios, multi-level movements of technologists, and assessments of interdisciplinarity and of impacts on laboratory researcher choices. The presentations are followed by discussant comments that visit the questions raised above.

Genevieve Maricle
University of Colorado-Boulder

Shaping Science: Turning Science Studies into Science Action

Over the past fifty years, 'science studies,' which in this case includes both science and technology policy (STP) and science and technology studies (STS) research, has evolved into a mature field of study. While its scholars come from a variety of disciplinary traditions, they have converged on a common goal: to evaluate, inform, and improve decisions about science and technology so that the scientific research enterprise may better meet society's needs. This convergence parallels an increase in requests for such research. John Marburger, the US President's science advisor recommends that we develop "a science of science policy," and several pieces of legislation echo this sentiment within individual fields. Science studies has offered critiques of the knowledge

production enterprise, analyses of society's needs and interests, and suggestions for how science might shift to better achieve societal goals. Yet it has not evaluated how successful the field itself has been in achieving its goals. Without such an evaluation – or the criteria for it- science studies scholars cannot iterate and redirect efforts within their field. An opportunity exists, therefore to do just this - to systematically evaluate the successes and failures of this community. Accordingly, this talk asks: "how does sciences studies research influence decisions about science?" and presents the preliminary findings from such an evaluation. The talk will analyze the impact of science studies research on global change and nanotechnology research agendas – in the US and the UK. It will also offer a preliminary field guide for science studies scholars.

Brice Laurent
Ecole des Mines de Paris

STS as Facilitator for Public Engagement in Science and Technology Policy? Lessons from Current Debates about Nanotechnology in France

STS-related research has inspired recent moves in official policy discourses toward recognizing a need for public engagement in science and technology. With different scales across countries, such research is more and more mobilized toward implementation. Using current debates about nanotechnology in France as examples, this paper questions the ways through which STS contributes to the practical construction of public engagement in science and technology. Drawing on several official attempts made from 2004 to 2007 to engage the public in nanotechnology policy, I define who the "STSers" are in this context; in addition, I outline a spectrum for gauging their different modes and levels of intervention in public engagement—from theoretical reference to active involvement. The complexity of relationships between STSers and administrations, scientists and activists shows that expectations concerning public engagement in nanotechnology on the one hand, and the role of social science on the other hand, differ greatly among actors. That leads me to describe some of the difficulties STS has to face when trying to play a role in public engagement in science and technology policy, and to consider how it can negotiate them. By means of reflexive investigations of their own modes of intervention, STSers involved in public engagement would do well to explicate their framings of the issues at stake and their constructions of the "public" and its proposed "engagement." Such investigations could help foster necessary relationships between the different levels of STS involvement.

Haico te Kulve, Arie Rip
University of Twente, University of Twente

Constructing Scenarios of Evolving Industry Structures: Tracking Nanotechnology Entrepreneurs and Multi Level Dynamics in the Food Sector

Engagements with and between actors is one of the aims of Constructive TA in order to support the inclusion of broader societal aspects and more actors at early stages of

technological development and its societal embedding. Such engagements occur anyhow, but CTA aims to make them more reflexive, for example through scenarios based on socio-technical dynamics. Key element in this approach is anticipatory coordination. Nanotechnologists, acting as institutional entrepreneurs, are practising anticipatory coordination whole the time when trying to develop new linkages between actors and future technologies. Take for example attempts of research entrepreneurs to mobilize resources for the development of nanotechnologies for food packaging applications. Consumer requirements of cheap, convenient and healthy food are translated in research questions aiming at for instance the development of nano improved packaging materials which keep food longer fresh. To explore and actually exploit nanotechnologies for such applications requires co-operation and development of new relations. At the same time broader societal aspects are important to take into account, such as health and environmental issues of nanoparticles and opinions of consumers, which may further shape developments. To analyze dynamics in food packaging and construct scenarios of evolving industry structures, we suggest to broaden conventional notions of industry structures and to apply a multi level analysis. By adopting this approach, more spaces for interactions emerge, but also more room for engagements and opportunities for improving reflexivity of entrepreneurs and other stakeholders.

Cynthia Selin
Arizona State University

Between Hope and Prudence: Experiments with Scenaric Learning

This paper investigates the balancing of persuasion, provocation and plausibility in a national scenarios project focused around the societal implications of nanotechnology. The project broadly aims to open the future to critical reflection on the co-evolution of science, technology and society. The scenarios are expert produced naïve product scenarios, intended to be the starting point of the process, rather than the conclusion. They feature an extreme focus on technology: rather than constructing elaborate worlds that include politics, social movements and economic systems, these describe a nano-enabled product, much like ad copy. So that the scenarios are deemed plausible, substantial vetting occurs prior to dissemination. Scientists evaluate the scenarios, representing the first stage of engagement. The scenarios should also be provocative and persuasive enough to encourage fruitful debate and social learning in wider audiences. Such anticipatory dealings present theoretical predicaments and epistemological ambiguities. Intended engagements with a wide ranging group of stakeholders will trigger different communities of practice, with different modes of establishing what counts as knowledge and differing comfort levels with futuring. The aspiration for plausible scenarios is in tension with that of producing provocative ones. Scenarios are meant to shake things up, question assumptions, and instigate reflection about uncertainties, implications and deeply held beliefs about science and progress. Persuasion strangely ties together plausibility and provocation since the scenarios must be both credible and compelling. The combination of these desires- for plausibility, provocation and persuasion- frame more general problems of trust and expertise in the quest towards anticipatory governance.

Dave Conz
Arizona State University

Reflexivity Assessment of STS engagement of Nanotechnology

A major goal of the Reflexivity Assessment program component at the Center for Nanotechnology in Society at Arizona State University is to understand how engagement research and activities may influence the values and choices made by nanoscale researchers who are exposed to such activities. Choices made by researchers about problem selection, research framing, funding sources, collaborators, intellectual property arrangements, etc. are likely to help shape the direction of nanotechnology development, making choices viable intervention points. Interviews with nanoscale researchers in the CNS-ASU network and at other institutions and in other sectors probe the extent to which relevance to societal outcomes is/is not a part of scientific research programs and, if yes, how this type of orientation was introduced. Initial results are used more generally to understand how and why research programs change, as well as for baselines from which to assess whether change is attributable to an ensemble of related STS research and engagement activities. The assessment program is termed reflexive because it is meant to probe scientists' awareness of the broader societal systems within which they operate; and also because it is meant to result in social learning on the part of the network of social scientists performing the engagement work, for instance, regarding their own interrelation to the scientific networks they study.

Edward J. Hackett, Diana R. Rhoten
Arizona State University, Social Science Research Council

The NSF Integrative Graduate Education and Research Traineeship (IGERT): An Experiment in Interdisciplinary Education

The IGERT program seeks to "catalyze a cultural change" within graduate education through innovative, collaborative research models aimed at producing "globally engaged" PhDs able to function as "creative agents for change." For instance, IGERT students undergo a different process of socialization from their disciplinary peers. Do students trained in interdisciplinary graduate programs collaborate differently than those from departmental programs? Are there discernible differences in the character or quality of the work they produce? Forty-eight graduate students from a national spectrum of programs in earth, ecological, and environmental sciences participated in an experiment that addressed such questions. Of the 48 participants, half were in the early years of their graduate program, half were in later years; half were IGERT participants and half were not. Homogeneous groups of 6 were formed, balanced for field of science and gender. Each was given a research problem and spent 2.5 days writing a brief proposal to address the problem. Proposals were evaluated by a panel of experts. Each group's work was also audiotaped, videotaped, and observed. We compare IGERT and other groups on measures of social process--namely, identity, socialization, communication, and evaluation--and evaluations of research outcomes. Research products were evaluated

using verbally- anchored quantitative scales that reflected NSF's merit review criteria and additional characteristics of the proposal. Scales were formed of individual items, where appropriate. In addition, experts offered written evaluations of proposals. Key evaluative dimensions include intellectual merit, broader impacts, disciplinary quality, interdisciplinary quality, integration and synthesis, rigor, originality, breadth, depth.

Discussant: Sheila Jasanoff
Harvard University

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7.5 Towards a Socio-Technical Understanding of Architecture & Urbanism II:
Reclaiming the city: An STS perspective on urban knowledge and activism

Organizer/chair: Ralf Brand
Manchester Architectural Research Centre, University of Manchester, UK
ralf.brand at manchester.ac.uk
Andy Karvonen, <karvonen at mail.utexas dot edu>, The University of Texas at Austin, USA

Many recent studies on cities share an alarmist view of the impact technological change has on the social and spatial fabric of cities, pointing to growing discrimination and inequalities, alienation, enhanced social exclusion, urban "splintering" on a universal scale. This results in a kind of resignation and pessimism that is disabling both intellectually and politically. In this session, we explore how an STS perspective on urban studies might be helpful in moving beyond this "universal alarmism" (which rests upon soft forms of economic and technological determinism) by emphasizing the ambivalence inherent to all technologies, the significant potential of contestation of, and resistance to, technology-supported forms of discrimination, and the deeply contingent nature of the process of appropriation of new technologies and, as a consequence, of the social "effects" of technologies.

Papers will focus on the disparate ways in which city-dwellers, city-designers, and city-managers come to know and act upon cities. Building upon STS critiques of "expert culture", papers will unpack the contested ways of knowing and acting upon the city and will highlight methods of research that can be employed to gather and interpret data about such a complex artifact. Empirically based contributions about "socio-technical dramas" (Pfaffenberger) through which urban actors reclaim their city from seemingly unavoidable futures are welcome, but not required. Rather, we encourage submissions to focus on the broader theoretical, epistemological, and methodological issues associated with understanding architecture and the city from an STS perspective.

Michael Guggenheim
Ethnological Seminar of the University of Zürich, Switzerland

Determinism Lost and Found: Architectural Theory, Technological Determinism and STS

Architectural work seems to be deeply materialised and prone to technological determinisms. However, in the 1960ies and 70ies when deterministic modernist design thinking came into a crisis, new theories of buildings emerged, which included the temporalization of buildings and the invention of the user. Along with these came new attention for old, vernacular and existing buildings, for change of use of buildings and public participation. Before the 1960ies, buildings were hard, non-modifiable cubes of concrete, that changed society. Afterwards, they were malleable unstable assemblages that were shaped by society. These conceptual changes of buildings were related to a new interest in the social sciences by architectural theory and a new, more modest role of

architects.

In my talk I trace the emergence of time and the user as two seminal concepts to undermine technological determinism in architectural thinking. I analyse which problems these two concepts posed for architectural theory and how they were attempted to solve. Furthermore I try to figure out what STS can learn from these debates, given that they already mark a complex state of theory regarding technological determinism, and assuming that it remains ambiguous whether STS itself is more or less deterministic than these theories.

Govind Gopakumar
Department of Science and Technology Studies, Rensselaer Polytechnic Institute, USA

Acts of Infrastructure Making: Water supply and action in Indian cities

The "splintering urbanism" thesis proposes that global economic and social conditions are creating conditions that are propelling cities in the affluent and not-so-affluent world towards a condition of fragmentation and division that is parallely reflected in the fragmentation and unbundling of their undergirding infrastructures. If an appealing proposition, the "splintering urbanism" thesis has been accused of ignoring local political and technical realities on the one hand and urban social bonds on the other. These differences often question the validity of global propositions. This paper reassesses the "slintering urbanism" thesis based upon an empirical study of "infrastructure making" of water supply in three cities in India. Cities in India along with

their infrastructures are proceeding along diverse trajectories of transformation influenced not only by local articulations of political and techno-physical conditions but also by the actions and arrangements of diverse mixes of actors. Changed political, economic and legal circumstances in India have provided a fertile terrain for the formation of new social bonds and arrangements amongst an eclectic mix of actors who seek to improve the delivery of water and sanitation services in cities. The picture that emerges is of vibrant contextual specific processes of infrastructure making rather than prophesied by the dour predictions of "splintering urbanism."

Jeff Howard
School of Urban and Public Affairs, The University of Texas at Arlington, USA

Implications of rapid climate change for urban planning – A reconstructivist STS perspective

This paper focuses on a conundrum of urban planning theory and practice that in the early years of the millennium grows more conspicuous by the day: how to overcome the inertia of prevailing disciplinary concepts, institutions, and political-economic postures predicated on endless spatial, material, and economic growth in order to decisively confront the implications of rapid global climate change. Drawing on the theories of

democratic expertise and intelligent trial and error, the paper offers a preliminary survey of the intersection of planning and the reconstructivist mode of STS.

Barbara Wilson
The University of Texas at Austin, USA

Codes and Social Change: LEED versus the Environmental Movement

This project investigates the relationship between social movements and the built environment and specifically the recent appearance of "green" or sustainable building codes. Coding systems are as deeply embedded in our culture as the building processes they regulate. Since the initiation of regulation with the Code of Hammurabi, societal paradigm shifts have altered the systems of spatial organization that govern the built environment. As issues in society arise, regulations emerge to address such problems. For instance, building certification systems such as LEED and Green Globe provide a mode through which the social values of the environmental movement can be institutionalized into building practice.

If social movements, whose power then becomes harnessed and institutionalized in some sort of societal code, are the internal balancing mechanism against the hegemonic dominance of the market and state, then attention must be paid to the ways in which these movements are systematically incorporated into the building industry. Using social movements as a framework to analyze the power of societal value systems, this project will investigate the relationship between codes and social values through a case study that analyzes the modes in which the environmental movement has been institutionalized in the built environment, the efficacy of these regulatory codes in furthering those societal values, and how this institutionalization in turn effected the health of the movement.

Andrew Karvonen
The University of Texas at Austin, USA

Urban Ecology and Actor-Network Theory: Hybrid Geographies of City Landscapes

Historically, cities have been described as organic systems and have been compared to natural entities such as anthills, beehives, and the human body. Such descriptions focus on "natural" properties of circulation and flow that form urban metabolisms. Cities have also been described in mechanistic terms to reflect the emergence of large technical systems and the related increase in the circulation of capital. Again, metabolism serves as a central metaphor but the flows of the mechanical city differ from the organic city because they are governed by human control as opposed to natural laws. The focus on metabolism in both of these descriptions emphasizes the relations inherent in the built environment.

 In the 1980s, a new relational perspective of urban landscapes emerged: urban ecology. Theorists and practitioners from landscape architecture, the natural sciences, and

environmental policy ascribe city elements such as waterways, parks, buildings, and roads with hybrid meaning. Such descriptions tend to downplay the modern dualisms of urban/rural, natural/artificial, and technical/social, and instead view cities as collections of hybrid geographies. In this presentation, I compare and contrast the relational approaches of Urban Ecology and Actor-Network Theory to understand how such a shift from an object-subject perspective changes our understanding of the socio-technical-natural hybrids that comprise the urban landscape. I will argue that hybrid geographies constitute a new way of "knowing the city" and offer novel opportunities for local interventions to reshape the city to better serve resident needs.

Ralf Brand
Manchester Architectural Research Centre, University of Manchester, UK

Facilitating war and peace – The built environment in Belfast

Haim Jacobi observed that the architecture of a contested city like Belfast "reflects on one hand, and shapes on the other the struggle over identity, memory and belonging". In other words, the relationship between the built environment and the social reality in a contested city is a prime exemplar of a "seamless web" (Hughes) or a "technological drama" (Pfaffenberger). Symptomatic of this mutual shaping is the socio-technical constellation in the Short Strand area in East Belfast: The "peace wall" around this catholic neighbourhood increased the symbolic separation from the surrounding protestant area. Although there is a post office conveniently located just outside the Short Strand, it's inhabitants often go to the inner city just to drop a letter because they are afraid of crossing the peace line.

Recent attempts by individuals, developers and the Northern Irish Housing Executive aspire to break out of this downward spiral of reflecting-and-hardening conflict. Buildings and other urban artefacts have been constructed – or are being constructed – with an intention to facilitate positive encounters while still preserving a sense of security for their users. The proposed contribution presents the findings of an empirical study about the design and appropriation of one such building: The Stewartstown Road Regeneration Project, a building designed by and for the adjacent catholic and protestant citizens with a crèche, a convenience store, a community centre and: two exits – just in case "something happens".

Simon Guy and Olivier Coutard
Manchester Architectural Research Centre, University of Manchester, UK and Ecole nationale des ponts & chaussées; Technics, regional planning and society research centre

STS and the City: politics and practices of hope

This paper will reflect upon current perspectives on cities, technologies and the city-technology compact. In particular, it seeks to explore the implications of widespread dystopian analyses of technological change on research interests, agendas and analysis.

STS approaches seem well suited for this purpose, given their central focus on the study of mutual shaping of technologies and practices. The intention of this paper is thus to discuss how we look at the city and to make an argument for a "less hopeless" urban research agenda. We will explore the splintering urbanism thesis of Graham and Marvin (2001) as an exemplar of the strengths and limitations of current research on networked urbanism, which develops a more dystopian analysis of urban futures. We follow this analysis with some counter examples of empirical research which problematises some central assumptions within the splintering urbanism theses. Out intention is to once again emphasise the contingency of technological change in the context of urban design and development, and to complement an often justifiable technological pessimism with a politics of hope.

John May
University of California at Los Angeles
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History, Epistemology, and the Mechanization of Geographic Vision; The Case of the Urban Heat Island Concept

Certain novel technologies for viewing the earth have, since the Second World War, catalyzed the emergence of a new mode of geographic thought, one that might provisionally be labeled 'statistical-mechanical geographic vision.' This emergence is most apparent in the recent explosion of cross-disciplinary processes of conceptualization associated with the use of these technologies, as well the appearance of a host new concepts that have served to organize geographic, environmental, and human impact research in recent years.

One of the most salient examples of this trend is the case of the urban heat island concept; an idea that began to appear in the climatological literature in the 1940's, but lay relatively dormant until the 1970's, when it was recognized that constituent elements of the idea were amenable to analysis using earth observation satellites. Since then, efforts have focused on expansion and elaboration of the initial principles through a deep resonance between improved sensor technologies and richer statistical modeling. Today, the concept serves to organize a vast subfield – urban climatology – whose implications are just now beginning to be explored by practitioners from increasingly diverse backgrounds, ranging from geography and environmental science, to hydrology, engineering and urban planning (among many others).

Bachelard noted that "it is when a concept changes its meaning that it is most meaningful." The drastic transformation of the urban heat island concept over the past fifty years provides a meaningful perspective on the epistemological effects of technology on recent scientific practice.

END

7.6 In the Eye of the Beholder: Surveillance and the Performance of Identity

Organizer/chair: Andrew Clement
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David Phillips
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The increasing prevalence of surveillance technologies and practices has direct implications for individuals in their daily lives, and for the constitution of broader social norms. This panel directly addresses the conference theme of "Ways of Knowing". Surveillance and identification infrastructures – as they mediate the proliferation, capture, processing, and use of personal data – are providing new and problematic ways of 'knowing' individuals – who they are, the risks they pose, the actions they are entitled to or prevented from taking. This panel questions and critiques those infrastructures as we explore their use in the performance and protection of identity across different contexts.

The panel examines whether and to what extent surveillance limits or expands the ability of individuals or/and groups within particular contexts to perform their identities. It then compares the actual implications of surveillance to the rhetorics that are used to publicly address it and the government identification schemes designed to operationalize it legitimately. The contexts explored here cover a range of public and private spaces including technological monitoring of and intervention into body functions (Torin Monahan), collective expressions within the production of urban spaces and identities (Rhonda McEwen), the development a mobile phone based system for the coordinated delivery of user-, location-, and context-appropriate information around a university campus (David Phillips), the aggressive collection of children's personal information through commercial 'chatter-bots' (Ian Kerr), public participation processes in identity and surveillance initiatives (Krista Boa), principles for preserving the integrity of personal identity (Andrew Clement), and a discussant from the Surveillance Project based at Queens University.

Torin Monahan
School of Justice and Social Inquiry, Arizona State University

Corporeal Control through Information Networks

Information and communication technologies increasingly afford the monitoring of and intervention into body functions. Through these technologies, bodies are recast as nodes on vast information networks, enabling corporeal control through remote network commands, automated responses, or self-management practices. In this presentation, I investigate two such sociotechnical developments, which I label "somatic surveillance": commercial body-monitoring systems for health purposes and radio-frequency

identification (RFID) implants for identification of hospital patients. The argument is that in present and projected forms, these systems abstract bodies and physiological systems from social contexts, facilitating hyper-individualized control and the commodification of life functions. My position is not that somatic surveillance systems are negative, perforce, but instead that they are closely connected to political economies, discursive regimes, and cultural mythologies, which are then absorbed into and co-produced by the systems.

Rhonda McEwen
Faculty of Information Studies, University of Toronto

Tools of the Trade: Drugs, Surveillance and Mobile Phones

Legislation developed to govern wiretapping is no longer applicable to contemporary urban practices, especially the use of mobile phones. Concurrently, the mobile phone is part of an urban identity that spans youth and street cultures. The proliferation of inexpensive mobile phones and pagers has provided those involved in the drug trade with "counter-surveillance" tools.

This paper examines how the use of mobile devices within urban street settings is impacting surveillance law and policy. The paper identifies (1) the uses of mobile telecommunications devices within this context as part of an urban identity, (2) the limitations of existing legislation in responding to these uses, and (3) the issues raised as legislative reform is considered, including balancing a desire to keep the streets "safe", with protecting the privacy rights of all citizens - including suspected dealers.

David J. Phillips
Faculty of Information Studies, University of Toronto

Infrastructures of knowing: Smart Campus in your Pocket

The University of Toronto and Bell University Labs are currently collaborating to develop "Smart Campus in your Pocket," a mobile phone based system for the coordinated delivery of user-, location-, and context-appropriate information around the University campus. In addition to these utilitarian ends, the development project itself is intended to generate a working model for interdisciplinary collaboration across the University. Each stage of the project – developing and coordinating among the databases, the knowledge broker, the profiling and context engines, the RFID-tagged locations, and the mobile phones – will involve the participation of researchers and practitioners from numerous departments and disciplines.

The participating institutional and individual actors all have different ways, ends, and means of knowing, especially of knowing identities, desires, and affiliations. They will also have different interests and opportunities for integrating and sedimenting those ways of knowing within the developing infrastructure. This presentation will report on who is

involved in this infrastructuring of identity and knowledge production. It will also delineate the technical, economic, rhetorical, and cultural resources and tactics by which particular entities and relationships are articulated and stabilized.

Ian Kerr
Canada Research Chair in Ethics, Law & Technology, University of Ottawa

Chatting with No One about Nothing in Particular

The online world of kids is fun, interactive, and kewl. These days, it is the place where they hang out, express themselves, and perform their identities. It is also a place that is structured by seamless surveillance and the aggressive collection of children's personal information.

While privacy and consumer protection legislation contemplates and in most cases prohibits the collection, use and disclosure of personal information without consent, what happens when kids are giving-it up freely and voluntarily to their friends? And, what happens when those friends turn out not to be their friends but, in fact, avatars and robots programmed to develop empathy and trust while 'chatting' on IM, all the while monitoring their every word, logging, indexing and data-basing financial, medical and other personal information about them and their families?

Is this science fiction? Nope. It's BuddyBots. In this paper, I examine the legal and ethical issues raised by a new business model that utilizes 'affecting computing' and other techniques in human-computer interaction in the marketing and sale of products and services.

Krista Boa
Faculty of Information Studies, University of Toronto

Shaping our Identities Together: Approaches to Public Consultation about Identity and Surveillance Initiatives

Public consultation is a well-recognized mechanism for citizen participation in government policy making. Consultation on contentious issues, such as the implementation of new surveillance and identity systems, is particularly important because such initiatives risk adversely affecting the relationship between citizens and the state, personal privacy and other civil liberties. Public consultation in these types of initiatives, however, is quite challenging – not only are the political stakes high, but the implications of new technologies are generally not immediately apparent, even to experts. The controversial character of these initiatives as well as the novelty and complexity of the technologies and the subjective, contextual nature of the issues they raise call for well-informed and genuine public consultation processes. Too often these have been lacking.

Coming from the position that public participation is essential in the policy and decision-making processes of surveillance and identity systems initiatives, this presentation offers a framework for developing strong public consultation strategies sensitive to the types issues and implications inherent to these systems and which allows a broad range of voices to be heard. Based on these criteria, I examine the approaches used in several Canadian initiatives, including the Ontario Smart Card Project (1999-2002), a Canadian biometric national ID card (2003), and the Toronto Police Service's initiative to increase use of CCTV in public places (2007).

Andrew Clement
Faculty of Information Studies, University of Toronto

I am a rightful person! Protecting personal identity in the face of pervasive surveillance

Driven by intensifying demands to 'know' their population better, many states are increasingly exploiting new technological possibilities for fine-grained surveillance. Key components in such national surveillance regimes are identification schemes in which (nearly) all citizens, residents and visitors must be enrolled. In recent years, the UK, US, Australia and Canada, all Anglo-American jurisdictions that have long resisted the development of national ID schemes, have begun actively considering or even implementing them. With widely varying degrees of transparency, specificity and sincerity, these state governments have proposed sets of principles for guiding the development of these ID schemes. However, these have been largely framed in terms of bureaucratic goals and criteria. What has been notably missing is the framing of identity principles from the perspective of individuals as identity-subjects.

This presentation will report on a proposed set of subject-centred principles for protecting the integrity of personal identity. These principles are emerging from a current research project, Visions for Canada: Identity Policy Projections and Policy Alternatives, which draws upon the analysis of government policy and program documentation, as well as research workshops conducted in major Canadian cities involving multi-stakeholder expert representation. The proposed principles will be tested in light a range of contemporary challenges to the integrity of personal identity, including those raised in this panel as well as more widely known ones such as the kidnapping and torture of Maher Arar.

Discussant: David Lyon
Sureveillance Porject, Dept. of Sociology, Queens University
Discussant

END

7.7 Problematizing Technological "Appropriation"

Organizer/chair: Toluwalogo Odumosu
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Ron Eglash, Rensselaer Polytechnic Institute, eglash at rpi dot edu
Rayvon Fouche, University of Illinois at Urbana-Champaign, rfouche at uiuc dot edu

Recent scholarship indicates that the boundaries of the user/consumer - producer/designer dichotomy is permeable and porous. On the axes of social power, interface design and consumption/production, border crossings are proliferating. The term 'appropriation' has been used to describe the processes through which the old binaries are being destabilized, though the term is often employed with differing meanings. We seek to investigate 'Technological Appropriation' and seek to problematize and broaden theoretical foundations of 'appropriation'.

Toluwalogo Odumosu
Rensselaer Polytechnic Institute

Appropriating Techno-Agency Citizenship

In this paper, I review recent literature on users and how they are

constructed within STS academic literature, always in relation with the various technologies that co-construct them (after all, users, must be users of something). Utilizing the recent academic focus on 'appropriation' as a springboard, I attempt to conceptualize technological agency within a framework of democratic choice using case studies of users interaction with cell phone networks in Nigeria.

Ron Eglash
Rensselaer Polytechnic Institute

Appropriating Nanotechnology

The "appropriating technology" framework investigates ways in which non-elite groups can participate in the production of science and technology production by reinterpretation, adaptation, and reinvention. To what extent can nanotechnology be appropriated, and how might such appropriations either detract from or contribute to social and environmental sustainability? This paper will discuss prior models for the appropriation of technology by social movements (environmental justice, community informatics, AIDS activism, etc.) and compare their strategies to the possibilities for nanotechnology. Some critical junctures can be found in:

1) Indigenous knowledge systems: reinterpreting the significance of the molecular level in terms of local understandings of macroscopic material properties.

3) The outsider within: individuals with non-elite identities (by race, class, gender, etc.) in pure and applied nanosciences.

4) Civic science: integrating public interest values (eg equity of science benefits) and procedures (eg participation) in nanoscience.

Rayvon Fouche
University of Illinois at Urbana-Champaign

Mediating Hip Hop: Technology, Cultural Identity, and the Mixer

The study of Hip Hop can reveal how cultural needs and desires can influence and inform technological appropriation, use, and design. This paper will examine the DJ mixer as a site of cultural exchange, engagement, and negotiation between black culture, technology, and multiple forms of music. The mixer is a piece of electronic equipment that mediates the relationships between turntables, musical forms, beats, and signals. The mixer itself can enable a DJ to appropriate elements from multiple sonic origins to "mix", "cut", and "reassemble" them into something completely new. Thus, the mixer can become a site for multiple forms of appropriation. By examining how various groups and communities reconceptualize the mixer as a technology of musical mediation, I will explore how user of technology can determine the shape and structure of future artifacts. By examining music, musical performance, technological design and use, as well as the cultural arenas in which these individuals, artifacts, and belief systems interact, this paper will to contribute to the STS work on cultural identity and technology.

M. Cameron Jones
University of Illinois at Urbana-Champaign

Web Mashups: Technological Appropriation in Web 2.0

Mashups counter traditional models of production and consumption when consumers alter, remix, and recombine artifacts to create something which is both new and yet familiar. Web mashups are websites which combine and integrate data and services from more than one source. They allow users to create technologies which satisfy a personal goal or objective. The range of web mashup activities reflects the diversity of skills and expertise held by web mashup developers. Expertly constructed mashups include sites like HousingMaps.com, which maps out real estate listings from Craigslist.com on Google Maps. At the other end of the spectrum are web mashups constructed by end-users and those without formal programming experience. For example, members of the MemoryMaps community on Flickr upload screenshots of satellite photos from map services to Flickr, and use Flickr's photo annotation tool to attach notes to regions of the map images, creating interactive story-telling maps.

In its present form, mashups are another kind of technological appropriation – they allow skilled programmers, typically individuals, to develop extremely powerful and creative applications by combining existing applications with minimal amounts of 'glue code'. This allows the creative individual enormous technical leverage, generating new, working applications that conventionally would have required enormous resources and whole teams to approach. This is fascinating in its own right, but raises yet more interesting questions when we consider possible future developments as functionalities are developed to make mashups far easier to code, giving wider access to less technically sophisticated developers.

Min Suh Son
University of California, Los Angeles

The Technology of Protest: Streetcar Riots, Race and Public Activism

It is a little known fact that in 1871, Robert Fox incited a civil rights conflict in Louisville, Kentucky by boarding a streetcar, sitting down in the white section and refusing to move—a method of protest that predates Rosa Parks by 84 years. Fox was thrown out of the car, for which he took the streetcar company to federal court, eventually to win the case. This led to a "ride-in" campaign by black leaders that highlighted the dissonance between local and state policy regarding racial discrimination. This paper will compare various protests that occurred in cities worldwide, such as Louisville, Chicago, San Francisco, Rio de Janeiro, Seoul, and Beijing in the late 19th and early 20th centuries when the introduction of the new streetcar technology became a locus for expressing dissent against the state, local government or commercial interests. I argue that this emergent form of protest was different from the machine-breaking sprees of England and France in the early 1800s and signified a distinctly new form of activism. Though it has been argued elsewhere that these early protests were neither premodern nor fully modern, a closer analysis of streetcar riots and strikes as a widespread phenomena demonstrates that there was a distinct concept of citizenship, rights and agency—one that developed explicitly around new public transportation technology—that has been largely underestimated in understanding mass behavior of local societies during this era.

Shib Shankar Dasgupta
Rensselaer Polytechnic Institute

Appropriated Technologies: A Case study on Grameen Telecom in Bangladesh

Science and technology studies are primarily focused on the impact and relevance of technoscience on the general public. Eglash argues that the concept of general public hardly includes the "groups outside the centers of scientific power" (Eglash, et. el., 2004). In the Third World countries this disparity is acute. There are awkward statistics on the universal access of telecom services. In rural Bangladesh the villagers happen to be only the passive recipients of telecommunication services. These excluded groups sometimes

reinvent dominant technologies to suit to their own needs and purposes. They appropriate existing as well as new technologies and participate in creating new concepts and practices applicable for similar situations outside their communities. This paper is based on the thoughts of the field actors in Bangladesh. They speak for themselves. The views and expressions of the field actors provide the insight and supporting evidence for this study of appropriated technology. In the digital economy, a plethora of consumer goods, including the mobile phone, becomes the source of economic production tool. This in turn creates a space of flows challenging hegemony and power relations in rural societies.

This paper highlights Grameen Telecom's concept of shared resources in telecommunication as a unique idea to bring existing technologies to suit to the economic, political and social demands of rural poor people in Bangladesh.

We can try to view Grameen based on this three levels End-user tailoring by Morch (1997

Tarleton Gillespie (Discussant)
Cornell University

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7.8 Making, Knowing and Governing by Numbers

Organizer/chair: Ann Rudinow Saetnan
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Heidi Mork Lomell
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This session explores how statistical practices of knowledge-building and of governance intercept and interact with various ways of knowing, being, and doing, thus changing the very phenomena they set out to measure.

Ann Rudinow Sætnan, John-Arne Skolbekken, Marit Solbjør, Wenche Østerlie, and Siri Forsmo
NTNU

Potential patients making sense of numbers

Many medical screening programs are based on voluntary participation by lay end users. As a norm, such participation is based on "informed consent", and typically much of the information provided is in the form of numbers, such as the probabilities (risks) of various outcomes. Numbers also circulate in other aspects of the discourses surrounding screening programs and the information emanating from them. The numbers are presented as "immutable mobiles", as observations frozen into knowledge statements that can be moved, unchanged, from one context to another. But are the numbers immutable? In earlier research, the authors have shown that lay end users make sense of various forms of medical knowledge (e.g. diagnoses, prognoses, risk factors, apparatuses) by contextualizing that knowledge within their life worlds: What does this diagnosis mean within my family, in relation to my job, in terms of my values, and so on. Can the same be said of numbers? We examine extracts of interviews with women invited to mammography, bone density, and obstetric ultrasound screening programs, and analyze how the women deal with various numbers that circulate in the discourses surrounding these programs.

Luisa Farah Schwartzman
UW-Madison

Transplanting Racial Technologies to Another America

This paper examines how technologies of measurement of "race" developed in the United States get transplanted to Brazil. The metaphor of "transplantation" implies that applying these measures require a process of "disembedding" these technologies from the local U.S. context and "re-embedding" them into the Brazilian context. This transplantation is

necessary because methods that were appropriate for describing and intervening in the field of "race relations" in the U.S. provide distorted pictures of what is going on in Brazil. I will discuss three instances where this disjuncture happens: 1) the measurement of "racial inequality" in the distribution of resources across families, 2) research on "racial attitudes" (in particular research about beliefs about racial inequality) and 3) the use of racial categories to determine whether Brazilian students qualify for affirmative action in university admissions. The paper has the following goals: 1) examining the work that goes into making these technologies transferable, that is, into making the measurement of "race", "racial inequality" and "racial attitudes" applicable from one context to another, 2) examining the ways that this transposition ignores and thus obscures local reality and 3) examining the way that the new "reality" created as consistent with the new technologies is only superficially similar to that of the U.S., while its meaning is fundamentally different on closer examination.

Svein Hammer, Jon Hovland and Gunhild Tøndel
NTNU

Knowing by numbers: Technology of governing, and remaking mechanism?

This paper discusses how measurements of "outcomes" (seen both as a way of knowing and as a technology of governing), have remade the reality of Norwegian municipalities: In the social democratic era the production of public services was typically governed through regulations, procedures and defined objects. The last five-ten years techniques like these have been supplemented, supplanted, and altered through a neo-liberal discourse, characterized by foreshortened hierarchical structures, "empowerment" and "dynamic interaction between equal actors," and, most important for us: practices designed to define expected results/outcomes, make these definitions operational through measurable indicators, act in relation to the selected indicators, and measure and report their outcomes. The theme "ways of knowing" is here introduced in two related ways. First: through the standardised indicators, the actors learn to know what they should focus on in their work. Second: through the measurements the actors will know what their outcomes are, and, as part of this, where they have to improve. Of course, in both ways the knowledge is based on a tough reduction of complexity; still, the indicators and their measurements often function as something objective and unquestionable, as the solution to "avoid subjective assessments" and "get the facts on the table". Our analytical questions on this discourse are: How do the dual acts of standardisation and quantification function in relation to each other, how do they interact with the other factors mentioned, and what effects do these interactions have on the ways of municipal knowing and working?

Gunhild Tøndel
NTNU

The mutual shaping of medical diagnosis practice and statistical knowledge-building

In most of the Western countries the financing of many public health services is now based on physicians' reports of diagnoses and procedures. The DRG system is often the tool used for translating these categories into budgetary units. It is basically a case mix and grouping system. On the basis of diagnosis codes, surgical procedure codes, gender, age, and discharge routines, it groups the in-hospital admitted patients in approximately 500 groups. Diagnoses contained within each group are presumed to be similar both medically and in terms of resource requirements. The system's legitimacy depends on its ability to describe the hospitals' activities, without changing the construction or production of medical diagnostic practice. In Norway a controversy has arisen concerning physicians' ability to diagnose patients without bringing economical considerations into this decision making process. Even more interesting is how this statistical governance technology reshapes medical diagnostic practice and the physicians' routines for reporting medical diagnosis codes, as the DRG system interacts with the translation process from qualitative knowledge of patients' condition to units; codes and numbers. How do physicians translate "the right" diagnosis to "the right" code, generating "the right" number? How does this translation process interact with medical diagnostic practice, hence shaping both the individual medical diagnosis and the re-presentation of the patient in his/her patient journal(s)? And how does this affect statistical knowledge-building, which in turn affects both the financing of public health services as well as epidemiological diagnosis statistics? The paper's analysis builds on participant observation and physician interviews in an internal medicine ward, where the physicians do differential diagnostics and code the resulting diagnoses on a daily basis.

Jon Hovland
NTNU

Systems of distinct knowing: How and why practices of governing-through-measuring matter.

Norwegian municipal administrations have over the last decade heavily increased their use of tools such as surveys and "balanced scorecard". These changes in ways of knowing about the organization are accompanied by new ways of governing and new structures of praxis and power. Depending on where in the organisation you ask, these changes are understood and described differently. A consequence of this divide is that phenomena like (a.) decisions that should be case-regulated become economy-regulated and (b.) increased power centralisation in the central administration vs. units and politicians, are seen as the same, but understood differently at different positions in the organisation.

Taking statistics and measuring as a departure point, I argue that there are four essential debates with corresponding dilemmas: Categorisation and standardisation, quantification, model analysis and formalising structures. The first three are familiar and I will describe their debates briefly. The fourth is a way of seeing how these activities strengthen their own system or discourse, and I suggest to discuss this through Immutable mobiles (Latour) vs. Boundary objects (Leigh Star), and Discourse (Foucault) vs. Communicative

system (Luhmann) to explore the possible motivating forces behind this development of cult(ure)s of measuring, and the changes they seem to produce.

Lidia Santora
NTNU

Turning diagnosis into numbers -- The changing concept of osteoporosis over the past century

About over hundred and fifty years ago osteoporosis was known as skeletal bone decay, a natural manifestation of "old age". Since then, the medical understanding of osteoporosis has developed through several transformations from a disease of biological properties to numerical fact. In the 1994 working group of the World Health Organization announced a diagnostic definition of osteoporosis as a value for as bone mineral density of 2,5 SD or more below the mean of young adult mean. According to the WHO definition of osteoporosis, about 30% of women above 70 years of age worldwide will be proxy diagnosed to have osteoporosis. Obviously, this statistical definition masks and creates potential problems for both individual and populations.

This article will present the diverse understanding and construction of definition of osteoporosis in trans-historical context by tracing the medical research efforts through review of the medical literature. In order to answer the question of why the WHO definition represents osteoporosis as it does, attention will paid towards internal scientific factors (medical research findings) and factors of non-scientific nature (social interest) and their implications for shifting definitions and diagnosis. Additionally, the various perspectives such as that of clinical practice, clinical research, social policy, epidemiology, health promotion and economics will be sketched out as criteria for explanation and understanding of osteoporosis.

Heidi Mork Lomell
University of Oslo

Crime statistics – problem or performance indicator?

Crime statistics are increasingly used, not only by the police in an attempt to govern crime, but also by the government, in an attempt to govern the police. In the past decade we have witnessed how crime figures are used not just as a problem indicator but increasingly also as a result or performance indicator. This development is affecting both the production and the usage of the statistics in the police organisation, and thus our knowledge about crime.

The police are more and more held responsible for crime reduction. Performance indicators such as the clearance rate, case closure time, and the overall level of recorded crimes are actively used by the government in reviewing the "performance" of the local police forces. Indicators play key roles in new ways of governing the police, and this is having an impact on the priorities in the police organisation, and also on how the police

produce and use crime statistics.

In addition, these indicators are mutually contradictory – for instance, working towards improving the clearance rate may actually conflict with trying to decrease the crime level. Ultimately, this new way of governing the police highlights how statistics, as a way of knowing, always has been formed by, or part of, ideologies of governance.

Note: We would welcome further papers that might "converse" well with our own, or even being merged with one or more related session proposals.

Note 2: As for the 7 paper proposals included here, we see various ways of "cutting" the set into two sessions. For instance one might divide them into views from "above" (or from a panoptic core, or a centre of calculation) vs. views from "below" (or within the field of control, or from the fact-submitting periphery) in organisational hierarchies. Alternatively: different practice fields (public administration in general vs. specific professional fields such as medicine and criminal justice). Neither division is perfectly neat and discrete. We might come up with a better suggestion later on, for instance after any relevant "orphan" papers or related sessions have been included. Therefore, for now, we have lumped all seven together and left them in random order.

END

7.9 Managing Ecosystems: Science, Culture, Values

Organizer/chair: Evelyn Brister
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Ecosystem management must be responsive to diverse visions of the place of humans in natural environments. This is true whether managers are restoring degraded ecosystems, preserving "wilderness," or conserving natural resources. While advances in environmental science, technology, and engineering raise hopes for constructing and renewing ecosystems, environmental policy and decision-making depend on negotiating the rocky terrain of multiple, often inconsistent value systems.

These papers approach the issue of value conflicts in ecosystem management from different disciplinary perspectives. They come together to illustrate both the promise and the limits of scientific ways of knowing vis-à-vis a wide range of epistemic, moral, and cultural values.

In particular, scientific ways of knowing are not currently applicable to normative, value-based controversies. Thus, while science can uncover the ecosystem services an organism provides, it does not have the tools to compare that ecological value with the organism's local cultural value. In many cases, these two value systems conflict, with the local system often being the one neglected. Nor can science, by itself, identify targets for ecosystem management, since human cultural systems and natural systems on any given landscape form a complex coevolutionary interaction that propagates continuous change—often masking the degree of past human intervention. And, finally, scientific ways of knowing need to recognize that cultural commitments regarding intervention or non-intervention in ecosystems can prescribe or proscribe the use of some management technologies.

David Tomblin
Virginia Tech

Mixing Science and Politics: An Experimental Recipe for the Ecocultural Restoration of the White Mountain Apache Tribe

This paper explores the role that ecological restoration, largely a Western-based land management technique, plays in the recent reemergence (1990s) of White Mountain Apache autonomy over the management of natural resources on the Fort Apache Indian Reservation. In general, the adoption of ecological restoration by Native Americans embodies the dual eco-political function of cultural resistance to and cultural exchange with Western-based land management organizations.

For the White Mountain Apache Tribe, resistance operates through an elaborate scheme of boundary work, which claims cultural, technical, and ecological differences between

Apache restoration practices and other North American cultures of restoration (e.g., federal agencies). The cultural appropriation of restoration technology by the tribe politically operates on two levels. On the one hand, these claims are designed to challenge Euro-American notions of restoration, wilderness, and western-based science. On the other hand, these claims help to reestablish cultural identity, reassert cultural autonomy, and protect tribal sovereignty.

Despite the immense energy expended delineating boundaries, the White Mountain Apache depend on cultural exchange with Euro-American land management agencies to successfully manage their natural resources. In general, exchange is accomplished through a series of boundary objects (of which ecological restoration is one) that act as loci of negotiation over how resources should be managed. As a result of this interaction, science, technology, and the reservation landscape are the products of an ecocultural hybridization process. Furthermore, this process reveals a potential framework by which a fruitful interchange of knowledge can occur between an indigenous culture and Western society.

Christine Keiner
Rochester Institute of Technology

The Contested Role of Oysters in Restoring the Chesapeake Bay Ecosystem

In this talk I will examine the recent history of efforts to elucidate the ecological and economic role of the oyster in the Chesapeake Bay, North America's largest and historically most productive estuary. Since the 1988 discovery of the oyster's role in cleaning the bay, it has acquired a new status--it is no longer a mere commodity, but an ecological linchpin. The tensions inherent in these competing visions have led to heated, ongoing debates over whether efforts to restore oysters should focus on maximizing ecological functioning (since oysters filter out pollutants) or on maintaining the traditional way of life of the watermen (who have fished the bay for three centuries), and whether these purposes should be served by focusing on the besieged native oyster (which is vulnerable to disease) or by introducing a heartier species from Asia (about which many unknowns remain). I will examine these current controversies with respect to the historical context of the Maryland and Virginia oyster industries.

Evelyn Brister
Rochester Institute of Technology

Natural systems, cultural landscapes: Appraising value judgments in ecosystem management

This paper analyzes types of value conflicts in ecosystem management. There are two predominant frameworks for translating values into management goals: a scientific model and a consensus-based model. Both foster systematic, predictable conflicts over values.

The scientific training of resource managers cultivates value-neutrality. According to this

framework, science can dictate means but not ends. This model lacks a normative stance for evaluating management goals. Thus, while it may criticize particular goals as arbitrary or contingent, it lacks a moral center to justify alternatives.

Consensus-based approaches to environmental decision-making are one response to the failure of scientific approaches to endorse management goals. Grounded in a democratic commitment to grassroots participation in environmental planning, consensus-based approaches none theless tend to reflect the power of entrenched interests. Consensus-based decision methods often ignore or trivialize value conflicts by proposing compromise solutions which distribute control over management goals according to the size or power of interest groups.

Both models see values as mere preferences. I argue that in an environmental context, some values are better justified than other values. Philosophers and social scientists can contribute to environmental decision-making by articulating types of value-claims, by examining the normative force of some claims relative to others, and by devising means of encouraging participatory involvement in decision-making.

Victoria Wibeck
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Perceptions of useful knowledge in environmental management-by-objectives

During the last few decades, the discourse of sustainable development has motivated new political strategies for action in the environmental arena. One such strategy, used in several countries, is management-by-objectives, which means that objectives are formulated, their attainment is directed and the results are measured. In Sweden, which is frequently cited as a world-leading country as regards environmental policy, efforts to achieve sustainability have been canalised through sixteen national environmental quality objectives. The process of monitoring progress towards the environmental objectives relies on scientific theories and methods. Nevertheless, choices of e.g. indicators to measure goal achievement and methods for data analysis are by no means uncomplicated. Different ways of conceiving of "good science", "usefulness" and "expertise" are competing in the system that has been developed to attain the environmental objectives.

In this paper, I present results from a Swedish case study which encompasses in-depth interviews and focus group discussions with scientists and civil servants involved in the process of assessing progress towards the environmental objectives. I will address questions such as: What types of knowledge are judged to be relevant, credible and legitimate in the assessment of environmental goal achievement? How do scientists, practitioners and policy makers position themselves and others? How is scientific knowledge communicated between different actors? How can supply of and demand for knowledge be reconciled in the assessment process?

Dean Bavington
University of Michigan
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The Death and Artificial Resurrection of Cod: From wild species to industrial farm animal

The Grand Banks off the island of Newfoundland on Canada's east coast once teemed with such an abundance of codfish that they reportedly choked the passage of vessels. About 500 years later, in 1992, fishing trawlers could find no cod and officials declared a moratorium on the fishery. Since then wild cod, and those who once relied on hunting them for their way of life, have failed to recover. This paper tracks the scientifically managed destruction of wild codfish and the resurrection of cod as a domesticated species. The paper argues that the desire for manageability in the cod fishery and the scientific representations that brought cod fisheries management into existence are deeply implicated in both the death and artificial resurrection of codfish.

Emma Johnson
University of California, San Diego
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Sound Science, Stewardship, and Sustainability: research for resource management at the Southwest Fisheries Science Center

Using ethnographic methods, this paper explores some of practical, ethical, and theoretical challenges facing policy-driven scientific research on sustainable resource management. The particular focus of this project is on two research divisions at NOAA Southwest Fisheries Science Center: protected resources and fisheries resources. Close analysis of what researchers say and do is brought to bear on questions both specific and broad about this work at the contentious interface between science and policy. Attention to the tacit and explicit knowledge of the political climate deployed by scientists in conducting, contextualizing, and presenting their research.

Resource management is one way to conceptualize producing the non-human world as commodities. Sustainable resource management takes as its unit of analysis not the individual organism, but populations, and in its best practices, complex, multi-species groups. The goal is to extract commodities without utterly destroying the habitat that nurtured them. However, it requires a radical simplification of nature to turn it into money. It often requires a certain measure of death and destruction of the organisms in question.

Scientists and practitioners know that the world is surprising, and sometimes quite nasty. So how do management regimes account for instability and fluctuation, non-human realms that don't conform well to private property regimes and all the rights and responsibilities of property holders? What do they see as the most notable successes and

the biggest challenges in their field? How do they critically engage with the debates about their field of expertise? Do they think that sustainable fisheries are possible?

 END

7.10 ICT and Hospitals

Organizer/chair: Ellen Balka
Simon Fraser University, Canada
ellenb at sfu dot ca
Ulrike Tikvah Kissmann, Humboldt-University Berlin, Germany, ulrike.kissmann at sowi.hu-berlin.de
Ina Wagner, Vienna University of Technology, Austria, iwagner at pop.tuwien.ac.at

The presentations of that session deal with the growing computerization in hospitals. Drawing on examples from Canada, Germany and Austria, the talks will describe the effects of computerization on how work is organized and knowledge is used by hospital staff. We will ask which ways of knowing exist in hospitals and which knowledge is formalized and implemented in the computer supported information system. Using case studies from different occupational groups in hospitals, presenters will discuss how and why varied occupational groups develop new forms of knowledge in relation to new information systems in hospitals.

Ellen Balka
Simon Fraser University and Vancouver Coastal Health

Barky cough, stridor, ashma or croup: Computerization of triage and the struggle over ways of knowing

A paediatric hospital purchased software to be used by nursing staff who triage patients in an emergency room. The program assisted staff in assigning a level of urgency to patients, and guided them through the process of recording a patient's chief complaints, through a series of nested pull down menus. The program was introduced into a paediatric emergency room, and a number of challenges arose.

The electronic triage program slowed the speed of work, resulting in delays of care for patients during busy times. Among the factors contributing to the slow down was a poor fit between the language inscribed in the electronic triage program, and the language in use by the nursing staff. The program had been designed by doctors, and reflected doctors' emphasis on diagnosis, rather than the language used by triage nurses to record a patient's complaints.

The program had also been designed to provide decision support to nursing staff as they went through the process of assessing the patient and assigning a level of urgency to each patient. Experienced nurses felt that the decision support produced less reliable results than their own triaging, and the experienced nurses worried that nurses who learned how to triage using the electronic triage system were less likely to think critically during their triage encounters. After 18 months in use, amidst complaints from nurses, a decision was made to stop using the electronic triage system.

In this paper, the struggle around the withdraw of the electronic triage software, and efforts to develop a new tool that would better meet nurses needs are discussed with reference to the theme of "ways of knowing" and key concepts in science, technology and society studies.

Pernille Bjørn
Simon Fraser University, Canada

Categories do have Politics also in Healthcare: Knowledge Support embedded in Electronic Triage Systems

In emergency rooms, resources, staff, space and equipment limit what can be achieved. Triage is the activity where highly skilled nurses with specialized knowledge sort patients into priority treatment groups upon arrival. In Canada attempts have been made to standardize triage, specifically by issuing explicit guidelines for triage across Canada and by developing standard definitions for five explicit categories in which patients are to be prioritized. The categories are referred to as the Canadian Triage and Acuity Scale (CTAS). CTAS has itself been used as an instrument for designing and developing Emergency Department Information Systems (EDIS). In keeping with the purpose of this panel to discuss ways in which knowing exists in hospitals and to explore how knowledge is formalized and implemented within computer supported information systems, we report upon empirical work conducted within the emergency department of the Children's and Women's hospital in British Columbia and on the implementation and later retraction of an electronic triage system. The problematical issues raised by attempting to formalize knowledge within triage work are investigated, especially when the categories are based on theory rather than practical experience. Further the ways in which the system embodies theories about ER work practices that are based on plans for work rather than situated practices are explored. Combining discourse analysis of documents about the electronic triage system with empirical observations and interviews with nurses in the emergency department, it is argued that EDIS systems that are built mainly upon theoretical categories may seriously constrain emergency practice, and be seen as the result of political agendas rather than practical analysis.

Per Lindberg and Ellen Balka
Simon Fraser University, Canada

Is the electronic medical record only a modern way to keep track of patients and their health records or could it be something more?

Is that what we know about patients and their health problems the right knowing? What do we know? What do we not know? What do we need to know? The typical paper-based medical record (PMR) reflects the context and tenets of western medicine with its often fragmentary view of the patient. Does it reflect the patient's health? If so, what is health? There is no consensus about a definition, but two main perspectives can be distinguished, one biomedical and one humanistic view. The PMR, a judicial necessity, is dominated

by the former view describing the therapeutic ambitions to identify anatomic-physiological deviations and to cure or give relief to the patient. Will the electronic medical record (EMR) just be another way of documenting this or could it be something more? The introduction of EMR has faced many problems, practical, ethical and jurisdictional, slowing down the process and yet not being able to demonstrate the full potential ascribed, e.g. easy access, accurate and coordinated information, time and cost savings, and an improved tool for data collection and evaluation. Expanded input of data, orderly organized, can open up a surmountable way for the therapist to conduct "grass-root research" evaluating effects of treatments and for the researcher a new realm of easily accessible data. Of course, questions arise what data is needed for the "right knowing" and should be put in, how this is done and not least questions of ethical and jurisdictional nature. Some suggestions will be outlined.

Ulrike Tikvah Kissmann
Humboldt-University Berlin, Germany

The introduction of workflow-systems in the operating theatre

The author will present findings of the research project "The effect of computerized knowledge in the operating theatre, from a gender perspective" (funded by the German Research Association, "Deutsche Forschungsgemeinschaft"). It analyzes the introduction of the new workflow-management-systems in the operating theatre. The role of these new computer supported information systems does not consist anymore in the administration of data and documents. Instead they aim at supporting the routines and work practices of the staff. The presentation will elaborate on the forms of implicit knowledge that exist in the operating theatre. The author will ask which implicit knowledge can be formalized and implemented in the workflow-system and which tacit knowledge cannot be represented in it. The occupational groups in the operating theatre – surgeons, anaesthetists and operating assistants or nurses respectively –are strongly gendered. The presenter will discuss how gender hierarchies are reconfigured through the different forms of tacit knowledge and the way they are implemented in the new workflow-systems.

The empirical data was collected by means of participant observation, video interaction analyses, narrative and biographical-narrative interviews. The author used a hermeneutical approach to analyze the videos as well as the interviews. She has studied the meanings and symbols that are embodied in the actions of the staff in the operating theatre. With this methodological approach the author has reconstructed the tacit forms of knowing. For more details: http://www2.hu-berlin.de/computerisiertes-wissen/ (soon also in English).

Renate Lieb
Humboldt-University Berlin, Germany

The effect of technical change on knowledge production in hospitals

With the growing economic pressure and increasing legal reforms in the German health care system, hospitals were required to introduce a higher documentation level. To meet these requirements, since January 2003, all hospitals in Germany have to work with the so called diagnosis related-groups (DRGs).

The DRG-System is both a medical documentation system and an economic accounting system. In my talk I will describe how the DRG-System changes the medical documentations radically. Facts have to be distinguished and selected from the actual clinical practices and must be translated to a formalised DRG-Code. In hospitals the DRG-Softwaresystem is used in different ways. Some hospitals have special coders for all cases in the hospital. In other hospitals, it is up to the doctors to code during the treatment of the patient. And finally, in other clinics a responsible physician codes for one department during the day, when he has some time left. My findings show, that different ways of integration of the DRG –System produce new forms of knowledge.

In my talk I will show how the DRG-system has changed the ways of knowledge production. My presentation will raise following topics and questions:

• Enabling technology: How are the DRGs integrated in the hospital information system?

• Organisational requirements: Who has to code and who has to bear responsibility?

• Professional context: What is the clinical practice in the different departments, how formalised are the medical procedures and how are they represented in the technical system?

Ina Wagner
Vienna University of Technology, Austria

Technology space relations - their significance for hospital work

All human activities have a spatial aspect - spatial issues crucial in understanding work. Moreover, materiality matters in how people interact in collaborative settings due to the public availability of material artifacts and embodied actions in the physical world. In physical space, bodies and artifacts are put into relations that are meaningful in themselves and suggest particular interactions, depending on scale and dimension. One of the virtues of physical artifacts (within a space that itself has material qualities) is their engaging capacity. They ask us to experience through seeing, touching, smelling, maybe also gesturing, heaving and moving. Involving all the senses is to do with richness of 'informational cues'. More importantly, materiality supports intuitive and simultaneous manipulation, mobilizing our tacit knowledge and enabling participation. Our direct engagement with artifacts and the direct feedback provided by materiality become part of the shared resources for coordination and expression.

Based on fieldwork in oncology clinics in Austria, this contribution reflects on the multi-

modality of artifacts nurses and doctors use and produce, on the role of particular physical arrangements of artifacts (layers, post-it notes, piles, placement of equipment within space, on the body, and so forth) and of spatial relations embedded in formats, genres and configurations. It also investigates how the presence of technologies alters the sense of space and how places in the hospital reflect other places and times.

Ina Wagner is the discussant of our session.

END

7.11 What Does it Mean to You? Making, Merging, and Judging Meaning across Socio-cultural Contexts

Organizer/chair: Noah Feinstein
Stanford University
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This panel explores how meanings, and the practice of meaning-making, warp and shift across socio-cultural contexts. The panelists address questions central to the social studies of science – questions of evidence, objectivity, incommensurability – in contexts such as the home, the school and the scientific borderlands of educational research. Rather than simply observing multiple meanings, each paper examines the relationship between plural meanings and possible actions. Collectively, they attempt to explain how people confront, reject or reconcile semantic and epistemological tensions – or, how they move seamlessly between the incommensurable meanings and practices embedded in their work and family life.

The six papers in the panel fall into three pairs, each juxtaposing empirical research with philosophical inquiry. The first pair addresses the construction and adjudication of knowledge. Bell and Bricker delve into the explanatory worlds of schoolchildren, while Dolle focuses on contemporary disputes in educational research. Despite their different contexts, both papers deal with evidence and judgment, the raw material of explanatory warrants. The second pair addresses the consequences of different ways of knowing. Feinstein examines how parents respond to the distinct meanings of "autism" in clinic, school and home. Waddington applies Dewey's philosophy to a closely connected question: how should parents understand their children's disabilities? The final pair investigates how multiple meanings can unite or divide communities. Azevedo uses ethnographic evidence to show how a community of hobbyists thrives upon different ways of knowing, while Kim and Petrina delineate the politically divisive notions of "open-ness" among producers and users of open-source software.

Leah Bricker & Philip Bell
University of Washington

Evidentiality in Children's Talk across Everyday Contexts

Children routinely participate in complex argumentation in their everyday talk and action—routinely demonstrating significant argumentative competence (Corsaro, 2003; Corsaro and Maynard, 1996; Goodwin, 1990; Goodwin and Goodwin, 1987; Ochs, Taylor, Rudolph and Smith, 1992). We are specifically interested in the forms of evidentiality children marshal and how they navigate everyday sociocultural contexts that contain various linguistic and metalinguistic demands.

This analysis is part of a team ethnography focused on better understanding young people's everyday encounters with science and technology (Bell et al., 2006). We have analyzed the forms and uses of evidence in the talk and gestures of the same children across a variety of social settings (homes, classrooms, afterschool programs, neighborhood settings) in order to better understand the educational and developmental implications of their argumentative competencies. Evidentiality presents itself in a variety of forms across everyday contexts—related to how children source, how they justify decisions, how they marshal data to persuade, and how they resolve or cultivate social disputes (cf. Aikhenvald, 2004). Criteria for evidentiality transform radically between imposed and elective pursuits—from the disciplinary demands associated with classroom instruction to the pragmatic rules associated with the social working of peer play. These shifts and tensions in evidentiality occur within the context of children's social participation with others across their life contexts. We present an analysis of these variable "social selves" as they relate to personal relationships with interlocutors, individual and collective motives, informal roles, and historical experiences.

Jon Dolle
Stanford University

Advocacy and Objectivity in Educational Research

Educational research is supposed to inform educational policy and practice. But the relationship between research, policy, and practice is complicated: research findings often are not easily translated into prescriptions for social or political action. Sometimes the scope of research is far more limited than the scope of the policy, making prescriptions difficult. Even when larger, more complete studies have been conducted, researchers frequently disagree about the efficacy of different educational practices, offering no clear consensus. Thus, when it comes to many pressing educational issues--high stakes testing, class size, charter schools, etc--little agreement exists in the empirical literature.

This presentation seeks to understand better the nature of persistent disagreements in educational research. To this end, I consider the tension between three conceptions of 'objectivity' and the actual practice of research. I begin by introducing three theories of scientific objectivity advocated by educational theorists and methodologists. I then consider the difficulties each theory faces as a guide to educational inquiry. None, I argue, gives an adequate account of the role of moral, social, and political values in educational inquiry, and none fits well with the actual practices of educational researchers. Finally, I conclude by offering an argument, rooted in social epistemology and feminist theory, which better articulates the nature and limits of objectivity in disciplined inquiry. This new account is not only more consistent philosophically; it also accords better with the practice of educational inquiry.

Noah Feinstein
Stanford University

Autism, Meaning, and Action

In 1943, two doctors working on separate continents independently coined the word "autism" to describe a puzzling group of children who exhibited great difficulty with communication and social interaction, and a marked preference for inflexible routine. Since then, the idea of autism has proven both highly mutable and impressively mobile. It has proliferated through various scholarly and popular realms, assuming distinct connotations in each. In the mass media, for example, it carries the suggestion of genius (Nadesan, 2005); in the psychiatric clinic (until very recently) it bore a crushing freight of parental guilt and shame (Silverman, 2004).

Parents of autistic children must confront the multiple meanings of "autism" as they develop their own local knowledge and traverse systems of care. This paper focuses on such confrontations - particularly the frictions that arise as parents follow "autism" from home to clinic to school and back. Drawing on data from a longitudinal interview study, I will show how parents become aware of the different, context-specific meanings of autism, and outline the distress and confusion that this awareness may engender. I will then describe the range of parent responses, including complete disavowal of the term "autism," deep investment in clinical/scientific systems of meaning, and a type of practical agnosticism the recognizes the value of autism as a currency, exchangeable for much-desired services. Finally, I will draw connections between the way parents respond to the many meanings of autism and the decisions they make about treatment and advocacy.

David Waddington
Concordia University (as of 9/07; presently Stanford University)

John Dewey and Technological Transparency

One of the most prominent educational reformers of the 20th century, John Dewey is probably best known as a pioneer of child-centered education. There is, however, an aspect of his educational thinking that has been largely forgotten—namely, his insistence that citizens should educate themselves about the technologies that underpin their society. This concept can be conveniently named "technological transparency."
In addition to providing a basic outline of Dewey's views on technological transparency, this paper will examine how these ideas could be applied in contexts beyond citizenship education. For example, parents of children who allegedly have learning disabilities might be able to strengthen their sense of agency with respect to their children's education if they understood more about the historical development of the concept of learning disabilities. The goal of technological transparency allows people to reveal and consider new layers of meaning.
Although Dewey's notion of technological transparency is a powerful idea, it does have some significant shortcomings which require analysis. Dewey's faith in the scientific method may have been excessive, and some critics have charged that his aspirations for a technology-infused citizenship education were overly ambitious. Yet, these weaknesses are not necessarily fatal to technological transparency. By combining Dewey's ideas with

some of the insights of contemporary thinkers like Bruno Latour, it may be possible to update the notion of technological transparency to create a useful new way of understanding.

Flavio Azevedo
University of Massachusetts Amherst

Holding on to One's Own Personal Meanings: The Case of Hobby Practices

The need to bridge multiple understandings of any concept is frequently observed when one crosses practice and/or community boundaries. Thus, people concerned with health and nutrition may face such issues while reading the news, in casual conversations with friends and family, or when visiting the doctor. In such encounters, previous understandings may be transformed and new ones may emerge.

However, what might happen when a single community of practice holds multiple meanings of any single concept? What structures and processes allow for the successful coexistence of multiple (and sometimes disparate) meanings of concepts core to the community's functioning? Indeed, what is the nature of practices organized around the flexible accommodation of personalized meanings?

I begin to address these questions with a 3-year ethnographic study of model rocketry. Because hobbies are prototypically interest-driven practices, hobbyists are encouraged to develop their own tailored versions of the practice. As a result, individual hobbyists become experts in very specific aspects of the practice, while simultaneously developing some common knowledge of its tenets.

In the case of model rocketry, rocket stability is a concept that centrally affects every rocketeer's practice. In spite of that, individual rocketeers develop very different understandings of it. To explain this phenomenon, I analyze hobbies at two different levels. At the institutional level, I show how model rocketry has developed to foster "variety in practice." At the level of local practice, I show how rocketry communities are structured to provide distributed, real-time support to rocketeers of all levels of expertise.

Soowook Kim & Stephen Petrina
University of British Columbia

What is "Open" in Open Source?

What is "open" in open source varies across semantic strata. Open source hackers and theorists define open source as a process of promoting inclusive participation in design, free access to public knowledge. Hence, the "open" is defined as freedom to access, change, share and transfer source code of software, freedom from the legal and disciplinary constraints of proprietary software, and freedom to download and share source code, open source software and other forms of data (e.g., audio, text, video) without financial exchanges. Open source users, on the other hand, which may include corporate sponsors, often define the open of open source somewhat differently. The recursive network initially integrating hackers, users and infrastructure is now redefined to encompass elements of the corporate software industry. Users of open source, such as

Apple and IBM, systematically rely on open source Linux and Apache, creating entirely different semantic strata for defining and interpreting the how and what of "open" in open source. As Mackenzie (2001) has noted, this absorption of open source into high tech capitalism challenges our assumptions about the interdependencies of commodification and property rights.

Discussant: Ray McDermott
Stanford University
END

8.1 The Challenge of Diverse Ways of Knowing: Assessing Biotechnologies in New Zealand

Organizer/chair: Joanna Goven
University of Canterbury
joanna.goven at canterbury.ac.nz

This panel presents findings from a research project (Constructive Conversations: Biotechnologies, Dialogue, and Informed Decision-Making) that has sought to uncover the varieties of knowledge relevant to assessing the risks and benefits of biotechnologies. The papers examine conflicts and complementarities among the various knowledges, as well as personal and institutional adjudications between conflicting ways of knowing. The technologies discussed here are genetic testing and biopharming. The case studies include: Maori negotiation of knowledge systems in relation to genetic testing and biobanking; the implications of recognising widely distributed expertise in assessments of biopharming and genetic testing; the role of knowledge of social context in evaluating animal biopharming in New Zealand.

Trina Taupo
Wellington School of Medicine and Health Sciences

Maori negotiation of knowledge systems: responses to genetic testing and biobanking

The complex and varied relationships that Maori (indigenous peoples of New Zealand) in different social locations have with western science (and human genetics in particular) is at the heart of an M.A thesis that explored the responses of three differently located Maori social groups to the challenges posed by genetic testing and biobanking. Focus/contact group discussion with Maori members of the Church of Jesus Christ of Latter Day Saints, a group of rongoa or traditional Maori health practitioners, and a group of Maori lawyers illustrate both diversity in the ways in which Maori respond to the issues posed by human genetics, and connections among them as they draw on Maori ontologies and epistemologies. In the reviews of these discussions, which constitute the core of the thesis, Maori can be seen juggling alternative frames of reference and negotiating between knowledge systems. The aim of this presentation is to highlight the notion that there is no single voice nor one perspective that can claim to represent knowledge, just as there is no predominant theory or homogenous position. Rather, there is an openness to a multiplicity of approaches.

Joanna Goven
University of Canterbury

Knowledges and meanings: recognizing expertise and assessing biopharming

Wynne's paradigmatic study of Cumbrian sheep farmers argued both for recognition of (what has come to be called) "lay expertise" and for institutional reflexivity regarding frames of meaning. While this has sparked a considerable debate about the nature of expertise, less attention has been devoted to what it would mean to take Wynne seriously in prospective risk assessment. This paper presents findings of a research project aimed at eliciting a more diverse range of knowledges relevant to assessing the risks and benefits of particular biotechnologies (biopharming and genetic testing) in New Zealand. The research has demonstrated not only that diversifying the types of knowledge incorporated into risk assessment is necessary for competent decisions but also that incorporating knowledge of the "receiving" social context also leads to explicit consideration of wider questions of purpose and meaning. The research thus contributes to debates about expertise, about the epistemological bases of risk assessment, and about the challenges of adjudicating in practice among types of knowledge in institutional decision-making.

David Shamy
University of Canterbury

Knowledge of risk: assessing animal biopharming in New Zealand

This paper will explore the knowledges relevant to assessing the risks of animal biopharming (the farming of animals genetically modified to produce pharmaceuticals). Institutionalized risk assessment methods are generally poor at identifying the risk implications of a technology in its likely social contexts. Risk management procedures, built on the back of risk assessment, often prove to be impractical when entering complex and ambiguous social environments. This paper will argue for an approach to risk assessment that recognises the inevitable embeddedness of technologies and consequently seeks a greater diversity of knowledge—in particular, knowledge of particular social contexts—to inform assessments of their risks and benefits. The paper will illustrate such an approach with the findings of a project that identified, elicited and analysed knowledge of social contexts that is relevant to the prospective risk assessment of animal biopharming in New Zealand.

Lesley Hunt (Lincoln U): discussant

 END

8.2 From Endogenous Controversies to External Protest : Does Critique Produce new Scientific Regulations?

Organizer/chair: Didier Torny
INRA
torny at ivry.inra.fr

How do external actors seize internal controversies from within scientific and technological systems as fuel for critique and symmetrically, how does the mobilization of external actors around economic, political and biomedical stakes create new questions for research? These two questions structure our session, which aims to be actually symmetrical to the positions of laymen and experts, without a priori on which actors, processes and devices come under one or the other category. Through four papers, each based on a long-term analysis of the relationships between critique and regulation, we will study the variations of critique, from the core of laboratories to previously external actors.

The session will also show how sociology may organize its laboratory to follow actors skilled to mobilize networks and tools, and able to produce discourses, testimonies and expert evaluations. What kind of technologies must social sciences use to ground descriptions when Internet already provides massive discussions and information? Empirical and theoretical aspects can communicate by using a set of sociological tools built around Prospero software. The main goal is to provide instruments to analyze the operations that persons and groups perform when they resort to alarm, criticism, lawsuit or political action.

Didier Torny
Institut National de la Recherche Agronomique (INRA)

Repealing compulsory vaccination laws : the contemporary case of BCG in France

Fifty-seven years after it has been legally enforced, the BCG vaccination of children attending educational institutions (from day-care centres to high schools) is still compulsory. However, taking into account the epidemiology of tuberculosis in France, many expert evaluations on BCG have been published during the last ten years, building various scenarios of immunization policy to change over the existing obligation.

Relying on a systematic collection of the views of the implied actors and on the observation of groups of expertise groups, this paper will describe the evolution of this fieldwork marked by the growing expectations to get rid of the compulsion through a political decision, by focusing on three key questions:

- the uses of expert evaluations by stakeholders – health care professionals, anti-vaccination associations, who search to strengthen their opinions with undisputed scientific knowledge

- the progressive inclusion of knowledge produced by actors traditionally excluded from scientific evaluation – social scientists, ethicists, law, shaping a "second ring" of expertise.
- the role of the vaccine firm, which swapped from the "French" multipuncture formula to the "international" intradermal one, causing fear of vaccinal accidents and protests of unprepared healthcare professionals.

Francis Chateauraynaud
Ecole des Hautes Etudes en Sciences Sociales (EHESS)

Radical criticism and counter-expert knowledge in front of asymmetrical expert systems in Europe

By using long run case studies and comparative analysis, I will address different processes by which alerts and criticisms are taken seriously by scientists and lead them to transform or to defend devices, norms and institutions. To deal with this kind of process, I will present an analytical model which runs on the ongoing controversies about biomedical consequences of radioactivity, GMOs and nanotechnologies. For many years, these fields have been marked by struggles in which scientific arguments are seldom dominant, though they remain relevant. I will underline the ways by which actors produce different knowledge and alternative visions of future of science and technologies in society. How controversies, public debates, court trials and political mobilizations do affect the course of scientific development and innovation? This research takes place in a larger program on dispute resolution mechanisms, which focuses on a key question: in what conditions new arguments could appear, could be transformed in common features and could inform the design of standard devices?

Jean-Philippe Gendron
Université du Québec à Montréal (UQAM)

Framing Obesity: Rival Conceptions Rising From the Research

Often referred to as the most significant health problem in the developed world and having attained the status of epidemic at the global level, obesity has become a matter of growing interest in the medical field. Nevertheless, specialists from various networks of practice still don't agree about the etiology of the disease. Thus, while conceding that "[t]he ultimate biologic basis of severe obesity is unknown, and specific therapy directed to it, therefore, is not available", a 1991 NIH Consensus Development Conference Statement on Gastrointestinal Surgery for Severe Obesity that ultimately endorsed the latter, can be seen as a watershed event in the history of the treatment of obesity. The 1991 conference subsequently became the basis for the 2004 Medicare Coverage Advisory Council that convinced Medicare of the necessity for a policy covering obesity. That policy implemented an operational definition of obesity instantiated in a 2006 Decision Memo wherein the obese patient is henceforth defined as an individual with a BMI ? 35 and at least one co-morbidity. This operational approach contrasts sharply with pharmacological efforts to define obesity as a "chronic, relapsing neurochemical

disease", and to frame the issue as one of mental health resorting to a loosely defined "depression model" in the attempt. This paper will discuss the two different therapeutic approaches and how they seek to define both a pathological entity and a boundary.

Antoine Vion
Université d'Aix

Debating on standards

Standardization activities are characterized by 'a work in process' based on problem-solving and writing. Such activities are often considered internally as technical one, or externally as key activities in the economic competition. Analyzing debates on standards allow to explain how these activities implement an original kind of reflexive innovation. The paper intends to show how the main actors involved in such processes may make use of the past, call for financial bets and reinvest their experience in further debates, so that their companies increase their market shares. As main case study, the communication will explore the development of the GSM technology from the study of standardization processes and European regulation policies of telecommunications. First, we will present the evolution of the bargaining arenas and the networks of experts, from the very beginnings of the creation of the Groupe Spécial Mobile to the European directives regulating the mobile phone markets. We will try to stress the main changes in the ways of arguing, bargaining and problem-solving through these different arenas. This will constitute a first mapping of the main debates between bargaining actors. What we want to show is that critical discussions make debates jump from one arena to another. Following issue networks allows to understand the strategic role of some key relationships in such debates.

END

8.3 Ethics in Experimentation

Organizers:Martha Kenney, History of Consciousness, UC Santa Cruz, mkenney at ucsc dot edu
Jacob Metcalf, Philosophy, UC Santa Cruz, jmetcalf at ucsc dot edu
Astrid Schrader, History of Consciousness, UC Santa Cruz, schrader at ucsc dot edu
Jennifer Watanabe, History of Consciousness, UC Santa Cruz, watanabe at ucsc dot edu

Chair: Martha Kenney, History of Consciousness, UC Santa Cruz, mkenney at ucsc dot edu

"Can there be any ethical experimentation on others?" Kaushik Sunder Rajan posed this provocative question at the end of a fascinating and incredibly rich talk on the economy of clinical trials in global capitalism ("Biocapital, Clinical Trials, and the Figure of the Experimental Subject", January 2007, UC Santa Cruz). The question stimulated a lively roundtable discussion with the UCSC Science and Justice Working Group raising further questions concerning the im/possibility of informed consent within biocapital, the meaning of ethical relatings in experimental practice, the legacy of and potential for self-experimentation, and the status of human/non-human relations in the logic of clinical trials. Each contribution to this panel will take up one of these issues in some detail, querying how notions of consent, ethics, and accountability operate in specific ecologies of biocapital. Because the clinical trial is the privileged way of knowing in the pharmaceutical industry, we take seriously the need to think bioethics differently in an age where "life itself" occupies the center of the political-economic system. In this panel we will focus on the meaning of ethics, not as static, but as a continuous process in which we consider what it is to gain medical knowledge through experimentation and how to be accountable to experimental subjects.

Jacob Metcalf
Philosophy, UC Santa Cruz, jmetcalf at ucsc dot edu

Experimental Subjectivities and an Uncomfortable Bioethics

This paper uses clinical drug trial practices to articulate an uncomfortable bioethics. By calling this bioethics "uncomfortable," I emphasize the motivating tension between the ethical call to live well and bio-techno-capital's re/configurations of ways of living and dying. Too often, bioethics has sought to resolve this tension through fixing—or making comfortable—ontological categories of life in order to derive our obligations toward them. Here I find an ethical analogy to Kaushik Sunder Rajan's claim that biocapital overdetermines contemporary life. Overdetermination is a contextual but non-causal relationship in which a pervasive background foreshortens other possible ways of being. For bioethics, overdetermination occurs when ethicists are motivated by a false sense of the stability of the categories of beings about whose well-being we are concerned, such as

assuming the same informed consent procedures are appropriate for all research subjects. This results in several unsatisfactory outcomes: 1) bioethics easily becomes reactionary, opposing "unnatural" forms of life and death; 2) bioethics becomes myopic about the specificities of knowledge production and international biocapital; and 3) institutionalized bioethics can exist primarily to help researchers get around ethical dyspepsia. The uncomfortable bioethics I propose would recognize the co-production of the knowledge practices in clinical trials and the forms of subjectivity necessary to run the trials ethically. Ethical responsibilities of research teams arise out of the conditions of flourishing for the emergent subjectivities they generate. This paper includes discussions with an informant who ran an AIDS vaccine clinical trial that used new and promising informed consent procedures.

Jennifer Watanabe
History of Consciousness, UC Santa Cruz, watanabe at ucsc dot edu

A Matter of Translation: Incongruities in Animal Experimentation

Scientific practice involving animal experimentation has a long and complicated history fraught with ethical, moral and practical questions. The persistently discursive dilemmas of pitting animal suffering against human necessity continue to plague this highly contested and sometimes violent terrain more often privileging human needs over animal rights. Unsurprisingly, hegemonic demands for safe consumer goods, toxicological studies of the environment, progressive medical advances, forensics, and pharmaceutical fantasies underscore the very logic of this human–non-human relationship. Thoroughly embedded within this complex interrelating of what Kaushik Sunder Rajan calls *biocapital*, animal and non-human testing remains an absolutely fundamental and highly regulated practice. They serve as precursor screens for potential human clinical trials with the hope of ultimately yielding specific material gains in health and pharmaceuticals. This paper explores the asymmetrical and incommensurable relationship of value between human and non-human primates at a primate facility where biomedical research of this type takes place. Using my personal experience in the sciences and the discursive tools of the humanities, I want to reconfigure the false, reductive dichotomies of "either or" and consider alternative operatives for "use value."

Martha Kenney
History of Consciousness, UC Santa Cruz, mkenney at ucsc dot edu

Considering the Ethics of Self-Experimentation

In *Who Goes First: The Story of Self-Experimentation in Medicine* Lawrence K. Altman argues that self-experimentation by medical researchers is the "most ethical way to accept responsibility for the unknown risks associated with the first steps in human experimentation". This paper considers the potential of this claim through a careful case study of the self-experimentation of 2005 Nobel Laureate Barry Marshall. In the early

stages of his prize-winning research Dr. Marshall drank a flask of H. pylori bacteria in order to prove that it could infect the stomach and cause ulcers (previously thought to have been caused by stress). His experiment produced the intended results and brought international attention and credibility to his previously marginalized research. Although Dr. Marshall appears to be the ideal subject of the traditional understanding of informed consent, I seek to trouble this easy ethical position by shifting the focus from the experimental subject/object himself to the networks of relations and accountability in which he is embedded (with actors that include the scientific community, his family, pigs as experimental subjects, ulcer patients, and the H. pylori bacteria itself). By considering an experiment without the obvious knower/object of knowledge power dynamic, a more nuanced understanding of ethics in experimentation emerges in which veins of accountability flow in surprising directions. I contextualize this high-profile self-experiment within discourses of heroism, the economic and scientific capital imbued in a "good story," and the tension between individualism and collectivity in contemporary scientific research in order to situate ethics squarely inside biocapital.

Astrid Schrader
History of Consciousness, UC Santa Cruz, schrader at ucsc dot edu

From Bioethics to Ethical Relatings as Mattering – A Question of Temporality

Critiques of institutionalized bioethics are not new to Science Studies. It has often been pointed out that conventional approaches to bioethics presume the existence of a rationally deliberating subject as their basis. Rarely, however, are the shortcomings of 'bioethics' framed in terms of notions of temporalities that enable certain subject formations rather than others. In *Biocapital*, Kaushik Sunder Rajan links the reproduction of the neo-liberal subject through genomic technologies to specific kinds of temporality embedded in discourses of risk and probabilities. Building on Sunder Rajan's analysis, this paper attempts to link subject formations in experimental practices to notions of materiality and temporality. I argue that ethics, regarded as a question of possible subsequent consequences of scientific practices arrives always already too late on the scene of scientific activities, when these are configured as a series of events following each other in linear time. Any intervention into the capitalization of risk-becoming-prophecy seems impossible as long as genomic practices reproduce subjects as projections of genetic variations (in principle knowable as given presence) into a future - in principle unknowable - that recursively establishes the present. What may happen, however, if we stop treating scientific practices as merely epistemic interventions, set aside for a while our concerns with human knowledges about emergent objects, and instead begin taking the materialities of practices to which more than humans contribute more seriously? What other spaces and times may open up to locate the ethical in experimentation?

Discussant: Kaushik Sunder Rajan
Anthropology, UC Irvine, ksunderr at gmail.com

END

8.4 Agricultural (bio)technologies and international development: Engaging STS to make a difference

Organizer/chair: Dominic Glover
Institute of Development Studies at the University of Sussex, Brighton, UK
D.Glover at ids.ac.uk
Matthew Harsh, Genomics Policy and Research Forum, University of Edinbur gh; matt.harsh at ed.ac.uk
Jason Delborne, NSF Postdoctoral Fellow in Science and Society; University of Wisconsin-Madison, Dept. of Rural Sociology; delborne at wisc dot edu

We propose a novel type of conference session. Instead of emphasising the presentation and discussion of *completed* work or work under way, the aim is to convene a discussion and stimulate an exchange of ideas around a theme of common interest, with a goal to explore opportunities and directions for *future* research, communication or engagement projects, initiatives or collaborations.

Instead of formal presentations, the panel organisers will facilitate the session as a participatory workshop. To stimulate discussion, short, pithy "propositions" or "provocations" will explore themes, postulate linkages, highlight neglected issues or perspectives, and propose courses of action. (Examples are included in the list of proposed "papers", below).

The organisers will use the provocations as a springboard to launch three parallel small-group discussions on "research", "publication/ dissemination" and "action / engagement". In the final part, a whole-group discussion will be used to explore practical plans for future activities and collaborations, with the aim to encourage participants to take these ideas forward in the following months.

The thematic focus of this session will be on agricultural (bio)technology and international development. In harmony with the conference theme, "ways of knowing", the session will focus on the ways that the development agenda in relation to agricultural technology and rural development is set by institutions of established science, opposed by grassroots groups, challenged by alternative scientific and technological approaches such as agro-ecology, and sometimes meshed together, for example by those who promote genetically-modified crops alongside no-till farming and integrated pest management.

Dominic Glover
DPhil Candidate, Institute of Development Studies at the University of Sussex, Brighton, UK

Grand designs, and other mistakes about to be made

There is a consensus that genetically modified (GM) crops can promote sustainable agriculture and tackle hunger and poverty. The African Agricultural Technology Foundation (AATF), the New Partnership for Africa's Development (NEPAD), the Gates Foundation and centres like the International Rice Research Institute (IRRI) all place GM crops at their centre of their strategies.

These grand designs resemble a classic case of "technology push" and ignore many robust, validated insights from academic research and practical experience – that food insecurity and hunger are the products of poverty, not insufficient supplies of food; the technological treadmill; the flaws of "training and visit" extension and the "technology package".

Meanwhile, enthusiasts for the System of Rice Intensification (SRI) and similar agro-ecological approaches reckon that yield increases of 100 per cent can be achieved more sustainably, more quickly and cheaply than these grand schemes. While their arguments are resisted by established scientists, farmers and extension agents are trying the techniques; now institutes in the "periphery" of global science, in China and India, are beginning to examine the methods, and find them encouraging.

Led by established science, is another round of big mistakes about to be made? Perhaps. But are low external input technologies really more easily adopted by small farmers than conventional modern agricultural technologies? Can they really be characterised as examples of "demand pull"? And why is it that some of the most enthusiastic proponents of "no-till" farming and integrated pest management are the big agri-business and biotech companies that are pushing GM crops?

Matthew Harsh
Genomics Policy and Research Forum, University of Edinburgh

Does STS need to step backwards to democratise ag-biotech?

To a large extent STS opened the debate on what it might mean to democratise science and technology, giving us analytical tools like 'public engagement' or 'participation of scientific citizens.' These days we've got institutionalised consensus conferences, citizen juries, science shops and even discuss the models of citizenship and democracy that underpin them.

But this work and its institutionalisation have occurred in the North, where states are major actors. Especially in the EU, states provide funding for participatory exercises and (sometimes) use the results to regulate technologies. What happens when we go 'South,' where states usually play none of these roles and where functional democracy, at the level of practical interactions between the state and poor farmers, might not exist?

In place of the state is an overlapping maze of international agricultural development networks and public-private partnerships that creates interactions with farmers, usually

via offering them technologies. Social interactions with these technologies frame the essence of democracy – the capability of farmers to "influence the basic social circumstances of their lives," as Sclove puts it. Especially regarding agricultural (bio)technologies, there might be more at stake in democratising technology in the South than in the North.

Are the STS literatures on participation and engagement the best tools we have to understand and shape these interactions in the South? Do we need to step backwards and examine theoretical trajectories within STS that created these tools, keeping development in mind? How do we design research to retrace our footsteps and create different tools?

Abby Kinchy / Jason Delborne
PhD Candidate, Departments of Sociology and Rural Sociology, University of Wisconsin-Madison / NSF Postdoctoral Fellow in Science and Society, University of Wisconsin-Madison, Dept. of Rural Sociology

The politics of "uncertainty": How can STS contribute to policy debates about ag-biotech?

Advocates of agricultural biotechnology (ag-biotech) typically say that there is no evidence that novel crops cause harm and demand that policies regulating ag-biotech be based on "sound science." Critics of ag-biotech, in developed and developing countries, often attempt to refute this view by citing scientific uncertainty and the need for precaution. As STS scholars, what is our role in ongoing political struggles over ag-biotech? In particular, is "uncertainty" a useful orienting concept for our work?

Some STS scholars, including Bruno Latour, have recently raised concerns that our field of study has put a weapon into the hands of global warming deniers, creationists, and others who appear to be on the losing side of the scientific evidence. In a similar sense, critics of ag-biotech may impair parallel environmental struggles—such as the debate over global climate change—by legitimizing scientific uncertainty as a basis for positions across the political spectrum.

Can STS find a solution to this dilemma that does not require us to retreat from a critical perspective on science and technology? One way forward may be to examine the cultural values and economic interests that guide interpretations of scientific uncertainty and to bring them more explicitly into democratic political debates about ag-biotech. However, this approach may have pitfalls of its own. Does drawing attention to values and interests undermine environmentalist and consumer movements that rely on "objective" scientific information to make compelling appeals for tighter regulation?

Julius T Mugwagwa
PhD Candidate, Innogen Centre/Development Policy and Practice, Technology Faculty, Open University, UK

'Newness': Keeping Africa shackled to her old self?

Agricultural technology and policy discussions in Africa carry an outstanding and sometimes astonishing emphasis on 'newness'. The newness envisaged, among many issues, encompasses new institutions and new human capital and new forms of interaction between and among institutions. The experiences of many national, regional and international development actors in Africa in efforts towards cross-national harmonization of biosafety systems in southern Africa testify to this scenario.

Given the rapid rate at which technological and policy challenges in biotechnology are emerging, and with Africa emphasizing 'new' measures at each twist and turn, this provocation bemoans the opportunity costs of putting in place the 'new' measures. The newness thrust creates an expectancy mode among the stakeholders.

The pressure for 'newness' comes from both internal and external sources, although the majority of stakeholders feel the pressure emanates from outside Africa, and that the internal pressure is only a response to the norms set outside. From the sociological perspective of expectations, one question being asked is, to what extent has persistent lack of delivery from the plethora of new measures derailed the policy trajectories in Africa? What are the institutional and other trade-offs in the quest for 'new' approaches, understandings and delimitations of 'newness'? Can STS approaches such as systems of innovation theory, sociology of expectations or the public arenas model of problem conceptualization help us understand the quest for newness?

Benjamin Cohen
Department of Science, Technology, and Society, University of Virginia

What do you mean 'participation'? The assumptions of democracy, agricultural policy, and public discourse and the value of STS scholarship

STS and democracy literature has blossomed over the past decades, offering key contributions to governance issues. At the first level, these are issues of public engagement and participation—how to bring citizens into technical decision-making processes. But they also open up a new set of questions, namely, participation by whom, in what way, and toward what end? STS scholars themselves also live within that second level of questions. How do we participate in such debates? In what way? For what purpose? I'd like to offer a provocation aimed at those questions.

I suggest so, because this much is true: we, as STS scholars, have learned things (e.g., that science is a social process, expertise is culturally situated, trust and credibility are related to that expertise, knowledge too is situated). Having learned them, we've then observed assumptions at play in public conversations about science—in policy, media, education—that match or fall behind what we've come to think of as science. We do this a lot. I do this by reference to alternatives to ag-biotech discussed at local levels (farmers markets, slow food, community subscription agriculture, e.g.). Those forums, while

western, are part of the same larger conversation about the validity, purpose, and attributes of agro-environmental change in international development.

So what can STSers do to inform, instead of just observe, public conversations with assumptions that are (perhaps) more well-grounded than others? This, I suggest, is where STS scholars might make more important contributions to the practices of science in society and to green biotech debates in particular.

END

8.5 Anatomies of E-government

Organizer/chair: Anita Chan
MIT, STS
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In recent years, governments worldwide have begun to launch a range of state initiatives that collectively come to be known as Electronic Government. Promising to modernize government and prepare citizens for the global, information-based economy, such projects are increasingly playing key roles in both industrialized and industrializing states economic development agendas. But E-government is proving to be anything but a single entity whose definition scholars can assume has been fixed and established. It is instead emerging as a multiply malleable state strategy that manifests through such diverse pursuits as the integration of new information technologies (IT) into government functions (from providing national security to vote counting), enhancing public access to IT (through education or rural access projects), encouraging the regional development of private IT industries and the training of knowledge workers, and reforming the regulation of digital goods and intellectual property. This panel thus begins with the proposition that we uncover the diverse anatomies of e-government, tracing out the various social, political, and technological bodies that are born in the drive to remake governments as e-governments. What new actors, alliances, artifacts and architectures figure centrally in the pursuit of electronic government? What locally- or globally-situated practices do such bodies dedicate themselves to in a process of defining and enacting e-government? What languages and logics (or pathologies) do such bodies produce? Which relations prove critical? Which are remade? And which prove, perhaps, to be disposable?

Richard Arias Hernandez,
Rensselaer Polytechnic Institute, STS

How to Measure the Information Society: Dominant Discourses at the Colombian Bureau of Statistics and the Information Society they Construct/Ignore

Indicators are quantitative variables used to measure and inform about the estate of teleological systems. The nation state has regularly used indicators and statistics to know about the estate of the state's resources and to inform decision makers and rulers about the outcome of existing policies and the creation of new ones. Once Colombian government expressed interest in creating an electronic government and developing an IT Policy to enter into the so-called "information society," it became also necessary to have information about its baseline and its evolution. The Connectivity Agenda, the state agency in charge, associated with the Colombian Bureau of Statistics organized the first survey of Information and Communication Technologies in Colombia in 2003. It was considered by the other bureaus of statistics as a pioneer experience that could be emulated and expanded in Latin America. In 2006, a Latino American conference of these bureaus agreed on a form to measure the information society. This paper traces the construction of these surveys and indicators to measure the estate of the information

society and its "achievements" unearthing actors, institutional arrangements, discourses and socio-technical systems that are privileged to normalize the multiple versions of how the information society could be constructed in Colombia.

Jericho Burg
Univ. of California, San Diego, Communication

E-famine: How Information Technologies Have Transformed Humanitarian Practice

Since the 1970s, various governmental, intergovernmental, and nongovernmental organizations have designed famine early warning systems to try to solve the problem of famine. The idea behind these systems is that with enough of the right kind of information about weather, agricultural production, market performance, and public health, famines can be accurately predicted and prevented. These systems have become increasingly automated as information technology has become more of a focus in both government functions and humanitarian response. At the local level, governmental and nongovernmental workers alike receive training in how to collect information in standardized formats for centralized processing and eventual dissemination to donor governments in the West, which fund the bulk of famine relief efforts. These information practices have several effects. They transform populations into numbers of bodies requiring a minimum amount of kilocalories per day to survive. They validate certain accounts of famine and disregard others, particularly those of famine-affected people themselves. In so doing, these practices fundamentally shape what the rest of the world knows about famine and famine-affected populations. Based on participant observation among early warning experts in Ethiopia, as well as archival research at humanitarian agencies, this paper examines the relationship between efforts to standardize early warning information practices and humanitarian relief operations as together they institutionalize famine in particular ways.

Jelena Karanovic
New York University, Anthropology

"Dematerializing" the Republic: Interoperability, Electronic State Administration, and Entrepreneurship in France

A network of innovative French civil servants has been trained in electronic administration and online services based on the Minitel and telematics; yet, by the mid-1990s these achievements belonged to the outdated framework of state-led innovation, and France was perceived as lagging in adopting internet—a symbol of innovation based on entrepreneurship and venture capital. This paper addresses the development of e-government in France as a technological and policy shift: accessible and efficient e-government was intended to "change the mentalities" among business, administrative, and political elites and transform state involvement in technological development. Based on interviews, media analysis and participant observation in France in 2004-5, I examine how the principle of interoperability emerged in the early 2000s as "radical" and yet key to the desired form of state "dematerialization." I argue that, by insisting on

interoperability, the French state "optimized" (mutualiser) investment in e‑government through entrepreneurship based on free software and open standards, while heeding the anti‑trust policies mandated by the European Union and national laws. This has in practice raised questions about the objectives and means of "optimizing" free software development and advocacy, evident in the creation of the French institutional free software license CeCILL and the forking of the SPIP software by the French Government's Information Services. More broadly, this paper invites a discussion about meanings, strategies, and alliances in advocating open standards and free software in e‑government internationally.

Anita Chan
Massachusetts Institute of Technology, STS

Of Mountains, Mines, and Milk Farmers: Network Logics and the Unlikely Alliances of E‑Education Projects in Rural Peru

This paper examines Peru's Plan Huascaran, a national digital education program largely funded by Microsoft which promised to launch Peruvian public schools into the 21st century. Oddly, it promised to do this not by equipping schools with new information technologies directly, but instead by focusing on cultivating conditions for the collaborative networking between diverse public and private actors invested in local region – including public school administrators and educators, regional and federal government administrators, civil society groups, and crucially, corporate representatives – who could then pool technological resources together. In the process of fostering such networks, however, a number of strange and unlikely partnerships get drawn together. In the highlands of Cajamarca in northern Peru, one such "successful" partnership that has emerged is that between the transnational gold mine, Yanacocha, and several milk farming communities. While Yanacocha has more commonly had to dedicate its resources to defending itself from accusations of ecological pollution and economic devastation from local farming communities, who have repeatedly organized to demand the mine take responsibility for its environmental and economic effects in the region, Plan Huascaran works to deflects such accusations by emphasizing a network logic of collaboration over conflict.

 END

8.6 Time, Space, Sociality and the Uses of Mobile Wireless Technologies: In Between Science and Technology Studies and New Media Studies

Organizer/chair: Licoppe Christian
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Judy Wajcman, Australian National University

A central theme of research on wireless, mobile technology is the way the appropriation of the various artefacts that come under that broad categorization weave together representations and experiences of space, time and social relationships, thus raising deep issues for social science. This session brings together some leading researchers on the uses of mobile and portable technologies that focus on the issues of time, space and sociality. It therefore relates to development of user studies in STS, that of new media communication studies, as well as various forms of activity theory (since in such approaches technology and its use cannot be separated from the activities in which they are embedded). A secondary aim of the session will be to discuss the relevance of various research approaches with respect to increasing the theoretical relevance of the growing corpus of finely detailed empirical material that characterizes mobile studies.

Judy Wajcman
Australian National University, Canberra

Life in the fast lane? Mobile devices and the management of time

Assumptions about the pace of life speeding up abound in contemporary social theory. While many factors are contributing to this phenomenon, information and communication technologies that operate at ever-faster speeds are seen as the main drivers. This talk considers the way social theorists analyse the concepts of time and speed and then reports on a research project that examines the social impact of the mobile phone. In practice, much of the contemporary debate is about how to manage time in everyday life – time for work, time for families and time for leisure. This paper will therefore investigate how mobile devices are transforming the temporal dimensions of daily life. My argument is that while the hitherto neglected temporal dimension in sociological theory is now being addressed, there is an urgent need for increased dialogue to connect social theory with detailed empirical studies.

Richard Ling
Telenor, Norway

Social cohesion and the rise of mobile communication.

The talk would consider the way that mobile communication is contributing to (and in come cases disturbing) our sense of social cohesion. While other ICTs have been disruptive of social cohesion, research has begun to show that mobile communication

supports cohesion within the sphere of close friends and family. The mechanisms that are used here draw on the development and elaboration of mutually defined rituals that are used both in copresent and in mediated interaction. This paper will consider these issues.

Co-proximity events : weaving mobility and technology into social encounters
Ecole Nationale Supérieure des Télécommunications
Co-proximity events : weaving mobility and technology into social encounters
A recording of mobile conversations has yielded some scattered examples of conversations in which callers' first topic involves noticing, telling or enquiring about their own location and/or that of others. A particular class of such conversations which blend mobility, technology and sociality into a particular form of social engagement, are those in which the caller frames the way she mentions her location into an assertion about her proximity to the caller's current location, or the caller's likely current location, or to landmarks that are meaningful to both participants and relevant to the ongoing situations. Such talk simultaneously contructs co-proximity as a noticeable fact (on the cognitive side), and an event to be noticed and mentioned (on the normative side). 'co-proximity events' are conversational accomplishments. While similar situations may occur without mobile phones, one can argue that the availability of mobile phones facilitates the production of 'co-proximity events'. In that way, mobile technologies are embedded in the taken for granted 'infrastructures of encounterability' that govern the emergence of occasions for social interactions in everyday life. We will eventually show how the design of mobile technologies (and particularly the use of location awareness resources) may radically alter the 'infrastructures of encounterability' and shape 'co-proximity events'.

Laura Forlano
Columbia University
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Making Work Public: Knowledge-sharing and Collaboration in Mobile Work Spaces

This paper examines the social and digital ecologies of wireless networks in cafes, parks, and other public spaces. Specifically, it attempts to answer the question: 3) How does face-to-face contact, interacting with wireless use, in these public spaces enable knowledge-sharing, collaboration, innovation, and community formation. This paper will present the results of a six-month survey and interviews with the users of WiFi hotspots in cafes, parks and other public spaces in New York. The survey was conducted between October 2006 and January 2007 in partnership with NYCwireless, a community wireless group in New York, and with support from Microsoft Research. Over 400 responses to the survey have been collected to date. The survey is also being conducted in Montreal in partnership with Ile Sans Fil. The in-depth interviews focus on three research sites: Bryant Park, Starbucks and the JetBlue Airline Terminal at JFK. To date, nearly 20 interviews have been conducted. In addition, over 500 photos have been taken to document the practices surrounding WiFi hotspots. In contrast to the current debates about municipal wireless networks in the United States, which continue to advocate for "anytime, anywhere" coverage, I argue that WiFi hotspots represent an important form of

network culture in a relatively small, bounded community and that this distinction should fostered an preserved through content, applications and policies that support these new work practices.

Lina Dib
Rice University
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Cultivating Memory: Enhancing the Human with Mobile Recording Technologies

Human memory is considered essential for the performance of everyday tasks, as well as for the creation of an individual's sense of self and community. Yet it is also often characterized as elusive and fallible. New digital computer systems and wearable sensors promise not only to extend human memories but also to enhance them by logging environmental cues and activities not even perceived by humans, such as one's pulse, temperature, and GPS readings. Scientists are proposing new ways of conceiving of the past by capturing bodies' physical reactions and movements within space. This paper examines the development of mobile recording devices through an engagement with the discourses and practices of interdisciplinary researchers who convene around the design of digital memory tools. No longer bound to the organism or moment itself, memories are treated as though they can be sustained in artificial environments. Like biologists working with tissues, information scientists seek to keep memories alive and cultured outside a living body. These technologies bring about not only the decontextualization of images from past events, but also the decontextualization of the very concept of memory as something transposable, that can be externalized, mobilized and supplemented. While the design of prosthetic memory devices involves modernist problems of juxtaposing mind and model, memories and digital images, this paper treats the problem of representation as practice, and the desires to capture experience as conditions in which notions of remembering and forgetting, as well as notions of time and space, are re-assembled.

END

8.7 Space, Material Culture, and Knowledge Production in the Human Sciences

Organizer/chair: Christine Leuenberger
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The papers in this session speak to how material culture and wider cultural developments influence theory production in the psychological sciences. In particular, the focus is on how social scientists, psychologists and lay people use material objects as meaning-making devices. Material objects can help facilitate thinking and reflecting about aspects of culture, politics and psyches. Rather than treating these meanings as inherent to the objects, the papers trace the process of their construction by different social groups or scientific communities. "The Scene of the Crime: German Criminal Psychology and the Problem of Early Film Spectatorship" explores how psychiatry, medicine, social policy, and the discourse of Weimar film elucidated the perils of cinematic spectatorship and how the cinema as a mass cultural artifact served experts as an interpretive medium for laying bare the inner physiognomy of the German people. "Confining the Psychopath: Transinstitutionalization, Diagnosis, and Prognosis in Twentieth-Century German Penology" focuses on the link between the rise of particular types of psychiatric institutions in Germany called 'psychopath facilities' and the notion of a distinctive psychological type: the psychopath. "Psychological Constructions of the Berlin Wall" examines how psychiatrists, applied psychologists, and psychotherapists invoked the Berlin Wall at different historical moments as an interpretative resource to reflect on the psychological make-up of the German people, make sense of societal transformations, and create and solve social problems.

Andreas Killen
City College of New York, CUNY

The Scene of the Crime: German Criminal Psychology and the Problem of Early Film Spectatorship

This paper examines the medical thematization of film spectatorship in early 20th century Germany. It focuses on the moment when experts in the human sciences began to make spectatorship an object of serious scientific analysis. From the early 1900s on, specialists in psychiatry, sexology and criminal psychology wove an elaborate commentary around the filmic experience, one that gained considerable influence over contemporary attitudes towards popular film, and that also served as an important test case for these scientists' claims to knowledge of a broad array of other contemporary phenomena. This commentary tied spectatorship to concerns about nervous "overburdening" and rising mental illness as well as the problem of juvenile crime. In particular, it stressed a model of film spectatorship as a distracted, quasi-hypnoid state vulnerable to manipulation and to suggestion. In the writings of criminal psychologists, this condition became the crucial factor that, despite the absence of solid empirical evidence, allowed them to establish a link between popular crime dramas and the perceived problem of increasing juvenile

crime. The space of the cinematograph itself served as a model for a wide array of other topoi within the emergent mass culture of early 20th century Germany. By composing numerous variations on the theme of the cinema's dangers to the developing mind, medical scientists and psychologists constructed a culturally resonant narrative of youth imperiled around the topos of the crime drama.

Greg Eghigian
Penn State University

Confining the Psychopath: Transinstitutionalization, Diagnosis, and Prognosis in Twentieth-Century German Penology

A psychological type associated in the early twentieth century with the works of Julius Koch and Kurt Schneider, the psychopath by the 1930s was widely seen by clinicians and jurists in Germany as a constitutionally abnormal individual whose pathologies primarily corrupted his emotional and sexual will power. The general consensus was that psychopaths were legally sane, but that their deformed character impelled them to lead "asocial" and "anti-social" lives. In the prisons and psychiatric facilities where, it was thought, they invariably landed, they were generally dubbed "troublemakers" (Störer) and incorrigibles, unwelcome in both settings. The psychopaths' reputation for institutional disruption and recalcitrance only served to further confirm the view that they were a psychologically distinct group. Studies and experiences in Nazi, East, and West Germany continued to reinforce the association of psychopathy with resistance to correctional discipline and rehabilitation. The development of so-called social therapeutic facilities in West Germany in the 1960s and 1970s, dubbed by some "psychopath facilities," was only the logical – albeit a somewhat circular one – conclusion, then, of a half-century conviction that there existed a group of mentally disturbed criminals for whom neither penitentiaries nor psychiatric facilities offered any solutions. The German attempt to find an appropriate institutional space for psychopaths, thus, highlights two things: it demonstrates how the legal order can create peculiar spatial needs and how, in turn, custodial demands serve to operationalize diagnostic and prognostic criteria.

Christine Leuenberger
Cornell University

Constructions of the Berlin Wall: How Material Culture is used in Psychological Theory

This paper examines how, in the latter part of the 20th century, the German psychological sciences used the Berlin Wall to interpret and make sense of the psychological make-up of the German people. It focuses on how the wall has been invoked by psychiatrists, applied psychologists, and psychotherapists in their writings at three historical moments: (1) after its initial construction in 1961, (2) immediately after its fall in 1989, and (3) 10 years after its demise. After the wall was erected, it became an interpretative resource to think about a divided society, and to make visible, decipherable, and classifiable the inner life of a people. Shortly after its fall, it continued to serve as a basis for categorizing

human suffering. Ten years later the wall had been rhetorically transformed into a "mental wall" offering a compelling metaphor for modern Germany's apparent psychological and cultural divide. The three case studies exemplify how the psychological sciences use material objects such as the Berlin Wall as interpretative resources to reflect on psychological issues, make sense of societal transformations, and create and solve social problems.

Discussant: Allan Young
McGill University, Montreal

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8.9 Ethnographies of Knowledge

Organizer/chair: Jessica Mesman
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This session brings together work that approaches naturally situated knowledge with methods that are sensitive to the intra-action of acting and thinking in the production of knowledge, as well as to the complexities of fine-tuning the different modes of cognition involved in sense-making, problem-solving and acting. How do humans accomplish difficult tasks and make sense of every day events? How to tackle problems and dilemmas? In other words, what kinds of resources are used in problem-solving, sense-making or diagnosing? In this working session we would like to focus on the constituents of knowledge to make sense of the world and act accordingly. Point of departure is the idea that knowledge is not something that people just possess in their heads but rather something that is constituted in interaction. The ethnographic studies presented in this working session will allow some insight into the production of meaning and the socio-material organization of the constituents of knowledge. Special attention will be paid to the question how bodily, linguistic and material resources play a role in understanding and decision-making. A focus on the complexities of human decision-making helps to identify the locus of knowledge and what actually happens at the interface of the constituents involved in knowledge production.

Monika Buscher
University of Lancaster

Order in Chaos: Making sense of major incidents

'Major incidents' – like train collisions, car accidents, or large scale man-made or natural devastation – require collaboration between different emergency service gencies, such as the police, the fire brigade, hospitals, paramedic and medical teams, and dispatch centres. They also require humans to understand and 'work with' often volatile and violent material agencies. Incidents arise because intense or fast-spreading physical reactions cause damage to material objects and bodies. Equipment, people, and matter embroiled in the chaos of an emergency incident need to be moved, treated and protected in as orderly and as fast a fashion as possible. To make sense of the (fast changing)situation, immediate victims and witnesses, response ersonnel en-route and on site, reporters, as well as command and control centre staff and policy makers rely critically on material clues. Materiality is key to both, chaos and order. However, a 'traditional' analytical focus on 'interaction'– between people, matter and technologies –can be misleading. It takes boundaries for granted that, as feminist theorist and physicist Karen Barad shows, are continuously negotiated. Agencies –human, material, technical, and hybrid – boundaries, and realities are situated effects of 'intra-action', the inexorable to-and-fro of causes/effects, actions/reactions, documentations/ interpretations. In this paper I present a study of the terial and 'matereal' methods of intra-actions during major incident

response, seeking to exhibit the 'matereal ethnomethodology' of the major incident emergency response workers and the material agencies involved.

Jessica Mesman
University of Maastricht

Resources of Resilience: hidden competencies of frontline practitioners to cope with the unexpected in tertiary care practice.

This research project intends to engage with the real-life complexities of clinical practices and processes, and is concerned with how constituents of knowledge are enacted in situ. Different modes of knowledge play a crucial role in stabilizing and strengthening tertiary care processes. However, the interaction of the involved cognitive modes needs further exploration. This presentation aims to explicate the hidden competencies of frontline practitioners in tertiary health care practices as part of their capability to cope with the unexpected and to preserve an adequate level of patient safety. By carrying out an ethnographic study within a neonatal intensive care practice, I try to gain a sense of how emotional, intuitive and rational, experiential and monitoring modes of attention entwine to avoid trouble. As such this study concentrates on resilience rather than risk and error. More specific, it is the process of alignment, fine-tuning and synergy between the involved forms of knowledge I am interested in. Besides the formal protocols and measurements which are explicitly aimed at the preservation of patient safety, we can also identify informal acts which have an explicit intention to preserve or re-establish patient safety. Therefore special attention will be given to the role of informal resources, like improvisation, ambivalence, intuition, implification, anticipation and tacit knowledge, in processes of sense-making, problem-solving, and reasoning. They are crucial elements of the fabric of practices in which patient-safety is accomplished. A set of analytical concepts will be used to identify the involved modes of knowledge and processes of alignment.

Merel Noorman
University of Maastricht

Connecting humans and artificial agents

A recent development in Computer Science and related research fields that has received considerable attention is the idea of adaptive and autonomous artificial agents working as 'team members' or 'assistants' in collaboration with humans in complex dynamic physical and electronic environments. It builds on the idea that artificial agents with increased cognitive competencies allow for the realization of new forms of humans/technology configurations that open up the space of possibilities for the production and organization of knowledge. The theory of Distributed Cognition as advocated by Edwin Hutchins provides conceptual framework for an analysis of the proposed cognitive connections between humans and artificial agents. Its conceptualization of cognition as a distributed computational process of propagating representational states across a set of "malleable media" provides a model for

human/agent systems. However, the theory discusses another relevant type of cognitive distribution. It stresses that cognition is formed by a continuous and adaptive process, building on accumulated knowledge that is crystallized and saved in social organizations as well as in material and conceptual technology. This paper considers the promises of agent research in light of the different types of cognitive distribution and explores how and to what extent advances in artificial agents research can affect the cognitive connections between humans and technology. In particular, it considers how existing patterns in the socio-material organization of humans and technology frames the possibilities and limitations of this research.

Discussant: Morana Alac
University of California San Diego

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8.10 Brains and Neuroscience
    Chair: Eric Racine
    Presenters: Eric Racine, Martyn Pickersgill, Dee Leahy, Kerwin Kaye

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Examining stakeholder perspectives and public understanding of the ethical and social issues of cognitive enhancement (CE) using methylphenidate

The use of neuropharmaceuticals for cognitive enhancement (CE) and other lifestyle purposes have sparked debates over the social impact of neuroscience. There is mounting evidence that methylphenidate (Ritalin) is being used by healthy college students to improve concentration and academic performance. Public understanding represents an important dimension of the social and ethical challenges related to CE but has yet to be examined.

Objectives
Assess print media coverage and existing scientific literature on CE.
Identify and analyze gaps in the ethical, social, and scientific analysis of CE.
Methods
Content analysis of international print media coverage of CE using methylphenidate; focusing on the media description of risks, benefits, social and ethical issues of CE as well as media descriptions of CE. Systematic reviews of the academic literature on the scientific, social and ethical aspects of CE and comparison of this literature with related print media coverage.
Results
We identified 22 articles describing CE in college students. Overall, media coverage was balanced, featuring both the benefits and risks of CE. However, not all articles presented

detailed data on the extent of CE or careful views about CE. For example, media descriptions sometimes referred to methylphenidate as a "study aid" or a "brain steroid." Key challenges discussed in the media include drug abuse; cheating; legal status of CE; over-prescription of methylphenidate and social meaning of CE. These challenges differed from those identified and discussed in the scientific literature.

Conclusion

There are important gaps between popular and academic discourses about CE potentially impacting public understanding.

Martyn Pickersgill
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Neurologic Expectations: Anti-sociality and the Promissory Brain

Neuroscience is an increasingly prominent branch of biomedicine, ever more visible in the medical, scientific and popular media. The brain is often constructed as having promise; knowledge of this special organ leading to improved treatments for mental illness and neurological conditions such as stroke, better ways of educating adolescents, and superior governance. Increased knowledge of the brain has also been used legitimate many older 'ways of knowing' citizens: hysteria, apparently, really exists; adolescents are hardwired to take more risks than adults; men and women really are different. Despite widespread support for neurosciences in scientific, policy, and popular spheres, the response of mental health professionals, however, to the 'promise of the brain' has been ambivalent, particularly for professionals working with individuals diagnosed with Personality Disorders associated with criminal behaviour, such as Antisocial and Psychopathic Personality Disorders.

This paper will critically engage with the 'sociology of expectations' to discuss the 'promissory brain' in the talk and texts of neuroscientists and psychiatrists. Exploring the expectations of both professional groups about the future of neuroscientific research in anti-sociality, this paper will identify contestations between divergent visions of the future and trouble simplistic 'bench to bedside' narratives of the translation of science into practice. The paper will argue that clinical receptions of the very ideas of new science and technology play an important role in their eventual development, and that the expectations of user groups is an under-examined component of the social shaping of technoscience.

Dee Leahy   Brains and Neuroscience Compiled
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The Mutual Construction of Epilepsy and Neuroscience.

Epilepsy has an uncontested status. It is presented and defined by neuroscience as a biological fact, caused by a discharging lesion which is located in specific areas of the

brain. The epilepsy/neuroscience/localisation relationship emerges at the end of the Nineteenth Century at The National Hospital for the Relief and Cure of the Paralysed and the Epileptic, most notably in the work of the physician John Hughlings Jackson, and most particularly through his construction of the distinction between 'epileptiform seizure' and 'epilepsy proper'. This distinction is one which is designated by, respectively, the physical or motor realm from which pure knowledge is gained, and the psychological realm: the realm which must be excluded from the site of investigation.

Jackson's work at this time inextricably linked the already circulating idea of 'localisation of function in the brain' with the phenomena 'epilepsy', so much so that I suggest that it is impossible to think of one without reference to the other. While Jackson's definition of epilepsy remains the contemporary neuroscientific definition, neuroscience, nevertheless, presents epilepsy as merely one of the many objects that neuroscience investigates and Jacksons construction work becomes erased. Therefore I will explore epilepsy, as not just one neuroscientific construction among many, rather, I will explore epilepsy and neuroscience as mutually emerging and co constructing objects. This paper explores epilepsy as an erased foundation (Butler), and as an invisible referent (Star). I will also explore the ways in which epilepsy continually returns as that referent.

Kerwin Kaye   Brains and Neuroscience Compiled
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Neurobiological Selves and Addiction

In the past twenty-five years, a new neurobiological approach to addiction has largely displaced an earlier medical formulation, replacing a definition which focused upon issues of bodily tolerance and withdrawal with a definition that focuses exclusively upon changes within the brain. While the older model of withdrawal took the avoidance of withdrawal pains to be the motivating factor within addiction, the newer model looks to an "imbalance" in pleasurable circuits within the brain. This shift from the avoidance of pain toward an overindulgence of pleasure represents a new mode by which the discourse of addiction serves to discipline an ever-expanding sphere of consumption. In this paper, I examine the use of addiction as a form of regulation over biopolitically defined subjects.

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8.11 Managing Nature
Chair: Phaedra Daipha (U Chicago)
Presenters: Phaedra Daipha , Chantelle Marlor, Zdenek Konopasek, Thomas Hoholm

Phaedra Daipha
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Weathering the Seas: Commercial Fishermen's Interactions with Weather and Weather Information

Building on my fieldwork at a forecasting office of the National Weather Service (NWS), I use my interviews in the fishing communities of Gloucester and New Bedford to venture beyond constructs of 'NWS forecast users' and concretely examine the forecast use and needs of commercial fishermen. In the process, I unearth fundamental similarities in the way fishermen and NWS forecasters engage with weather and weather information. Indeed, fishermen are renowned for their weather savvy, almost as much as they are renowned for their audacious battles against the elements. Their dependence on the weather for their livelihood, their dependence on the NWS for their weather information and their advanced understanding of local marine weather make them an obvious springboard from where to interrogate the dynamics between expert and lay knowledge about the weather. In light of fishermen's dynamic weather-related decision making process, I ultimately argue that the extent to which a forecast is considered good by its users has, paradoxically, very little to do with its accuracy, a fact that critically confounds NWS claims to expertise and undermines its credibility.

Chantelle Marlor   Managing Nature Compiled
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Clams and Measurement: A Cross-Cultural Comparison of Experts Coming to Know

In this paper I compare the processes by which four sets of marine ecology experts create knowledge about clams. The four sets of experts are: (i) Nuu-chah-nulth clam diggers, (ii) Kwakiutl clam diggers, (iii) Canadian government Department of Fisheries and Ocean's invertebrate biologists, and (iv) a team of university-based ecologists. The first two groups are indigenous peoples with a long history of clam harvesting. The latter two are university-trained biologists. All four sets of experts work with intertidal clams on the West Coast of Canada. My analysis focuses on measurement. All four sets of experts are actively involved in measurement: they make observations using their senses and other apparatus; they draw associations among observable phenomena and between observable phenomena and their working theories; and they assess the validity and utility of their observations. I examine how different types of experts make measurements. I will discuss how, in some cases, the experts associated the same pair of observables or

used the same observable as the empirical indicator for a mental construct (such as all experts associating small holes in the sand with the presence of clams), while in other cases they associated different pairs of observables or used different indicators for a mental construct (such as measuring the health of clams by observing the "lips" of the clam versus counting fecal contaminants in the water). I will conclude by considering the reasons for these similarities and differences as well as how measurement styles affect the conclusions experts draw.

Zdenek Konopasek
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Jan Palecek (Center for Theoretical Study, Charles University in Prague - Czech Republic; janpalecek at centrum.cz)

Catalogues, maps, and lists: Ways of knowing and evaluating nature

We study processes by which the European nature-reserve project NATURA 2000 is being implemented in the Czech Republic. These processes involve production and mobilisation of expertise as well as political negotiations and decision-making. Expert knowledge and scientific criteria were to play a decisive role in this project, any other criteria being only secondary. An extensive and systematic review of the state of nature was initiated. In the beginning, exhaustive catalogues of biotopes were created so that any piece of landscape could be classified during the subsequent fieldwork. Hundreds of collaborators of varying professional and scientific background were then hired to undertake an unprecedented mapping of the Czech nature. On the basis of such a mapping, lists of protected areas were created, negotiated and proposed for approval. We discuss these processes and procedures in order to highlight diversity of interests, strategies, practical purposes and applications that all together contribute to the creation of above-mentioned catalogues, maps, and lists (as "boundary objects" of a kind). Above all, we are interested in how the business of expert knowledge production and evaluation was from the very beginning intertwined with everyday administrative work of responsible regional bodies or with the political agenda of environmentalist NGOs. In conclusion, we confront such "messy" practical local arrangements with the primacy of purely expert criteria emphasised by the official NATURA 2000 documents and by participants in particular controversies over the proposed areas of protection.

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Organizing work practices through discourse

Through a case study of a Norwegian dairy cooperative this paper sheds light on how organizational actors engage in discursive work to enable/resist new practices. When management reformulated their identity from being a 'dairy cooperative' to a 'cooperatively owned food group', despite having little other than milk-based products, this opened up opportunities in new areas. However, this change did not occur without tensions. In an organisation representing 18000 farmers, it was not obvious to everyone why they should be involved in other activities than marketing the goods of the owners. Neither was it obvious that such new activities would work in practice. Nevertheless, this managerial reformulation enabled the use of knowledge and resources in innovative ways. We have investigated a set of innovation projects aimed at developing hybrid technologies and products between aqua- and agriculture.

Inspired by Barthes (1976), Knorr-Cetina (2001), Latour (1999), and (Dunford & Palmer; 1998), we argue that the already existing connotations (in the local setting) to the new discursive element is important for its reception and influence. Moreover discursive change might both serve to legitimize and produce innovation resulting in new socio-technical practices, and lastly; the way in which discourse are (sought) changed has severe implications for its outcome. Our study contributes with further insight into how discursive activities, such as reformulations of knowledge, both might serve to legitimize and take part in constituting changed ways of knowing, contingent on the situated interaction between the old and the new.

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9.1 Author Meets Critics: Geof Bowker
    Discussants: Pablo J. Boczkowski (Northwestern), Jessica Mesman (U
    Maastricht), Amit Prasad (U Missouri)

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9.2 Locating Genetic Knowledge and Responsibility

Organizer/chair: Miriam Padolsky
Health Canada
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This session examines the role of genetics in governance, societies, and cultures, paying particular attention to local variations in health practices associated with genetics as they emerge through historical and ethnographic research. We explore the disjunctions between the prominent role of molecular genetics in biomedical sciences and the variations in the meanings and practices that surround conceptualizations of genetic risk and personal and political senses of self. How does the experience of undergoing genetic testing or of having a potentially heritable disease in the family affect one's sense of self? What stories do social movements and cultures tell about genetic diseases? And how are limitations in genetics-based clinical practices and diagnostic instruments reconciled with expectations regarding the power of genetic information? Based on the case studies of Alzheimer's disease and autism, this session explores the complex ways in which individuals and communities experience and respond to their encounters with genetics and disease.

Margaret Lock
McGill University

Ungovernable Epigenetics

The belief that genomic knowledge will constitute a powerful form of governance for the future is questioned. It will be argued that as knowledge accrues about the cumulative effects of epigenetics over the life cycle, moral responsibility for disease should, in theory, be redistributed among governments, industry, and social institutions and focus less on individuals. Furthermore, while genetic testing and screening for single gene disorders with high penetrance may proliferate, for by far the majority of diseases testing is unlikely to be routinized due to a shortage of resources and the unpredictability of susceptibility genes. Results of ethnographic work carried out with subjects where Alzheimer's disease is present in the family, and who have undergone genetic testing as part of an NIH clinical trial, will be presented to highlight disjunctions among the social repercussions that arise as a result of undergoing clinical testing of this kind, the persistent uncertainties associated with the relevant basic science knowledge and with the risk estimates that are imparted to trial subjects, and the irresolvable tension between the value of DNA as a research tool and its non-applicability to clinical care.

Chloe Silverman
The Pennsylvania State University

Changelings, Cousins, Aliens and the Search for Autism Genes

Genetics has been embraced by many members of the autism research and advocacy communities as an explanation for the etiology of autism spectrum disorders. Although research to date has yielded many findings, only a few of which have survived scrutiny or attempts at reproduction, autism spectrum disorders are held by many in the field to be the "most heritable" of psychiatric disorders. Nevertheless, what "genetics" means to different constituencies can be highly variable. These meanings are often articulated less through explicit statements than through the images and metaphors that different communities have employed, and these images often borrow heavily from other narratives of heredity, from eugenics through kinship claims. This paper draws on interviews and historical texts to examine the history of a series of genetic figures that function to reinforce specific public beliefs about the genetic nature of autism. The first story concerns twins and changelings; the second is about a series of symptomatic mice, and the third involves vanishing geniuses, threatened eccentrics and the expansion of the category of autism to include autistic "cousins" with related conditions. By examining the genesis of these stories, this paper shows how ethical concerns have been incorporated into stories about the genetics of autism and provides some explanations for the flexibility and resilience of the more general concept of autism as a genetic disease.

Miriam Padolsky
Health Canada

Genetic Citizenship and the Alzheimer Societies

According to the National Institutes of Health (NIH), approximately 4.5 million people in the U.S. have Alzheimer's disease. The NIH expects this number to increase by 350% along with an aging population. Medical researchers are investigating Alzheimer's genetic basis, and many family members and patients with Alzheimer's express concern about the disease running in their family. Historically, the American Alzheimer's Disease and Related Disorders Association emerged hand in hand with the thrust of research on the disease, through strong bonds with the National Institute on Aging (Fox 1989). Today, the Alzheimer Societies continue to work closely with the medical community. Nevertheless, the Alzheimer Societies, which provide services and advocacy for Alzheimer patients and families, tend to deemphasize genetics. This paper examines the role of genetics in the work of the Alzheimer Society of Canada, focussing on field work research carried out at the Alzheimer Society of Ottawa. What explains the Society's approach towards genetics? What are the implications of the disjuncture over genetics between medical researchers and this social movement group? How does this case study affect our understanding of the concept of "genetic citizenship," which postulates that genetics is becoming a basis for new ideas about personhood and political engagement?

Jennifer Fosket, Laura Mamo, Janet Shim
McGill University, University of Maryland, University of California, San Francisco

Risky Subjectivity: Making Meaning of and Acting on Risk for Alzheimer's Disease

Social processes of aging have been highly medicalized in North America: From menopause to memory loss to sexual dysfunction, aspects of aging previously considered "normal" are more often categorized as health issues requiring intervention with an ever-growing array of medical knowledge, technologies and treatments.

This paper explores the conceptualizations of health, aging, normality, risk and enhancement in the context of Alzheimer's disease. The findings are based on an exploratory and comparative research study conducted in 2005 and 2006. The research utilized qualitative in-depth interviews with first or second degree genetic family members of people with AD in an effort to examine cultural and subjective understandings of the etiology of AD, interest in genetic testing for AD, and meanings and practices of memory enhancement in the context of genetic risk as it is culturally understood.

We explicitly focus on the complex ways that having a genetic relationship with a person with AD shape a person's sense of themselves as embodying a self- at risk (a risky subjectivity). In this paper we explore the ways those conceptualizations of risk and self are connected to actions: that is, how people pursue perceived memory enhancing, risk reducing or wellness maximizing strategies in the context of risk, uncertain medical knowledge, popularized images of Alzheimer's disease and aging, and personal experiences.

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In search of the innocent citizen. The experience of a science/policy network in genetics

In order to increase the social and/or political relevance of research, it is increasingly popular to include in knowledge production processes researchers from several disciplines and actors from non-academic domains. Science/policy networks emerge out of this growing interest. This presentation draws on an ethnographic case study of a network that brings together researchers and decision-makers active in genetics in Eastern Canada. We examine the discussions that led to the selection and integration of «citizens» in the network and the way their concrete participation unfolded over time. The aim is to shed light on their expected, unexpected and puzzling interventions in the network. On the one hand, it seems that researchers' and decision-makers' specific knowledge-based contributions are relatively well established, as well as their position towards genetics research objects. Their input and specificities are in a sense tangible and substantial. On the other hand, citizens are considered interesting and relevant mainly because of their candour and (relative) ignorance about genetics. They are asked to provide a kind of naïve reflection that researchers and decision-makers seem to have lost

after a while.

Relying on observations, interviews and document analysis, this presentation will clarify how citizens and their presumed ignorance are used to enrich the interactions within the network. We will examine some of the normative implications of their participation. We will then conclude on the asymmetry between those who are posited as «knowledgeable» and those who are posited as «ignorant» which may, over time, shatter the whole endeavour.

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9.3 Powers of Science; Powers of State

Organizer: Anat Leibler

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This panel whishes to explore the relationship between state institutions and scientific practices, while emphasizing the constitutive relationship between the two. Though the separation between knowledge and power was already blurred in the STS literature, the perception of the world outside the laboratory remains over simplified, as was argued by several scholars, (Jasanoff et. al. 1995) perhaps as a result of the 'micro' emphasis of much work within SSK, which tended to nurture very detailed and rich studies on scientific practices but not on the related political world. "Interests" became a substitution for complex concepts such as state, politics, society and culture, while other studies take the power of the state as given without problematizing it or seeing it as enhanced by science and technology. This criticism is discussed extensively by Jasanoff in *States of Knowledge*, (2004) which seeks to connect between the 'macro' and 'micro' levels of analysis. Following this reasoning, the theoretical ambition of this panel is to explore the role of scientific practices in general, in creating the state as a distinctive, rational and autonomous entity. We ask neither to ignore the state nor to reify it; we wish to avoid seeing the 'State' as a subjective actor with wills, and who is behind the scene. Rather, as Mitchell puts it, we wish to discuss "…the kinds of social and political practice that produce simultaneously the powers of science and the powers of modern states" (Mitchell 2002, p. 312 fn. 77).

First paper: Chandra Mukerji

UCSD

Title: Military Engineering and Social Vision: The Case of Sébastien le Prestre de Vauban

At the end of his career, the famous French military engineer, Vauban, developed a tax proposal that led to his exile from Louis XIV's court. This paper looks at what he proposed, and connects his social reasoning to his approach to military strategy and fortress design. His engineering was organized around death, and techniques for minimizing it. This was the same logic that he brought to his tax proposal. To Louis XIV and his courtiers, losing soldiers in battle was one thing, redistributing wealth to keep poor people alive was another. Vauban lived in a world in which knowledge of things mattered. The court lived in a social world of patronage relations, where loyalty mattered most. He wrote about social reality in France, and they threw him out of the court. Engineering was a dangerous business for practitioners and their patrons alike in the period because it nurtured a modernist imagination that was potentially destabilizing – even in the military.

Bruce Curtis Carlton University

Colonial Governmentality and State Science: the Gosford Commission of
Enquiry into Lower Canadian Grievances.

The Gosford Commission of 1835-6, sent to sort out the political grievances of the
British North American colony of Lower Canada, spent a considerable amount of time on
the question of the political representation of a minority population. The Commissioners
were pushed to think systematically about the relations among population, territory, and
security. They drew on and reworked available population statistics and attempted to
model political representation in a variety of ways. For one of the commissioners at least-
--Sir George Gipps---the Canadian experience encouraged a sociological understanding
of the conditions of colonial government.

Patrick Carroll

UCD

Beyond the Regulatory State Idea: The Constitutive State as a Co-production of Science
and Government

This paper argues against the idea of the regulatory state in analysis. The notion of the
regulatory state implies that certain realities exist in advance of government action and
only then are regulated. The idea of the constitutive state emphasizes how the network
practices of science and government constitute new realities. Where the regulatory idea
implies a relatively fixed image of the state, the constitutive idea points to the ongoing
constitution of new states of being. The theoretical argument is made with reference to
historical state formation in the cases of Ireland and California.

Anat Leibler

UCSD

Political demography as means of state building – The case of Israel-Palestine

This paper is based on a study of documents that were found in the private archive of
Roberto Bachi, who established Israel's *Central Bureau of Statistics* in 1948. During the
period 1938-1948 Bachi documented every step of his work relating to the demography
of the Jewish community in Palestine (*Yishuv*). His academic work, conducted while he
was the head of the *Central Medical Bureau of Statistics, Hadasa,* was extremely rich
and diverse and included papers, lectures and analyses of different demographic
phenomena, versions of a book he was writing, and extensive correspondence with the
major Jewish leaders of the time. In these documents he coined the term 'Political
Demography" by which he meant that the reproductive practices of Israeli Jews should be
understood as a means of state building. He raised concerns about three major themes:
the decrease of Jewish reproduction, predictions about the demographic balance between
Arabs and Jews, and characterization of "Mizrahim" as a unique ethnic group with traits
of its own based on reproduction rates, cultural patterns and social and economic
conditions. Although this was a one man's work, Bachi's demographic paradigm and

practices modeled the social epistemology of the way these immigrants were perceived by the state as well as the local sociology. In my paper I argue that demography was the foundations for the sociological thinking in a way that Bachi's work prefigured the 60's sociological theorizing of the Israeli society.

Discussant: Sheila Jasanoff (Harvard)

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9.4 Flows of Information and Technologies of Surveillance: Adaptations and Transformations of Personal Information in the Information Age

Organizer/chair: Jason Pridmore
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Information technologies have become central to social life but have likewise become the means for increasing levels of surveillance. These often blur the lines between public and private entities, and between systematic surveillance (e.g. on the part of government agencies or corporations) and peer based forms of mutual monitoring. At their essence, these technologies are used as a means for identifying crucial bits of information about their subjects, revealing potential risks to potential profits and serving to adjust or reorient personal, social, commercial, or governmental practices. This panel will discuss the developments and use of these new technologies of surveillance in a variety of contexts, focusing on the people, practices and intentions that exist as part of the design and operation of the technology. It highlights how the movement of information bound up both in technology and people demonstrates that surveillance is both a"way of knowing" and a "way of acting." These surveillance technologies exist as both knowledge gathering entities, with a systematic and focused attention to personal details, and enable the means for influencing, managing, protecting, entitling, or controlling subjects (Lyon 2001).

Carrie B. Sanders
McMaster University

Emergency Information and Communication Technologies: Increasing Efficiency or Disciplining Bodies and Places?

The terrorist attacks on the World Trade Centre in 2001 brought increased academic and political attention to emergency response and preparedness. The emergency communication problems encountered during the terrorist attacks have since been socially constructed and typified as problems of 'communication and information interoperability'. With increased attention to the social problem of 'interoperability', emergency response organizations have been centralizing emergency services through the implementation of shared Information Technologies (IT). Police IT, such as Computer Aided Dispatch Systems and Record Management Systems, have been described as tools of knowledge management, enabling officers to access information necessary for making 'informed decisions'. The present paper provides a critical analysis of these technologies and their ability to address the social problem of emergency 'interoperability'. Throughout this paper I explore the means by which emergency response IT is employed in-situ by two Canadian police services. This analysis uncovers how police IT renders people and places legible in new and technologically mediated ways. The information stored on police IT becomes disembodied and mobile, making it accessible across geographical boundaries for (re)interpretation at anytime. These technologies compress

time and space and create a system of orderings that are aimed at disciplining bodies and spaces. The information accessible on police IT transform work processes and have led to new forms of criminal labelling and patrolling, by constructing risks profiles on people, places and things.

Johanne Yttri Dahl
NTNU, Norway

DNA-registers: registration of the few - surveillence of many.

The use of DNA databases in crime related matters is often presented as a "new, great tool in the polices' armour on the war against crime". Rules and regulations regarding who can be registered in such databases vary from country to country. In Norway, only convicted criminals are subjected to this registration. However, this does not mean that DNA-registers can only help in the identification of present or past convicts. As our DNA is a compound of 50% of the genetic material from each of our parents, such registers potentially allow identifications which extend from the convict themselves to their direct relatives. This paper will explore some of the possible consequences of such familial searches.

Daniel Trottier
Queen's University

Lateral Surveillance and Social Networking Sites: The Case of Facebook

This paper will consider the emergence of online networking sites like Facebook and their implication on the boundary between private information and public knowledge. Social networking sites enable the (re)production of assemblages of social actors. Facebook in particular has been successfully embedded in everyday relations, garnering overtwelve million registered members who are dispersed along thousands ofacademic, business, and regional networks. While Facebook may betouted as a site of ubiquitous information exchange, its capacity forsuch exchanges amplifies the potential for instances of peer-based surveillance .

In seeking to make sense of emergent social networking sites, this paper will balance an appraisal of the contours and capacities of this technology with the meanings generated by a variety of actors seeking to render Facebook meaningful. Examining these meanings becomes all the more crucial in recognition of the fact that Facebook appears to nestle on the boundary that separates the private and public realm. Facebook will be appraised as both a network of information exchange and a manifestation that a network of users, producers and various degrees of experts are shaping. In particular, this paper will focus on the potentialities for surveillant relations among those who are situated in Facebook's social-informational network. Two broad themes that will be addressed are the asymmetrical – and potentially predatory – relations of information described as "Facebook stalking" as well as the responsibilization of users that occurs in recognition of this threat.

Jennifer Whitson
Carleton University

Inducing Informational Flows: Identity theft and the signifying subject

While institutionally promoted measures to prevent identity theft advocate risk avoidance strategies and shoring up weak points in the network of information exchange, the ordeals that victims must undertake to regain their stolen 'identities' take an entirely different tone. These recovery measures are directed at getting victims to signify adequately to meet institutional demands for information. In responding to occurrences of identity theft victimized citizens occupy a position traditionally held by offenders. They become the primary object of statistics, trend predictions, risk profiling, and surveillance in general and commonly suffer more from the bureaucratic trials necessary to re-establish their identity then from the initial victimization itself.

Jason Pridmore
Queen's University

Dynamic databases and surveillance: Modifying consumers, modifying technologies

Consumption has become a site of intensified surveillance as the gathering, retrieval and use of consumer data has proliferated in relation to advances in information communication technologies (ICTs). The availability of consumer data and advanced data processing techniques have led to a shift from mass markets towards markets of mass customization based on what is digitally discernable or inferred about consumers' desires and needs. Increasingly corporations rely on this data to build "relationships" with their customers and use these databases to "speak" to consumers. Yet these databases are also "spoken" to by the dynamic nature of information gathering and consumers' consumption practices. Corporate-consumer relationships are predicated upon an intensification of statistically significant overlays of data to understand consumers and a continual refinement of these analyses. Though fragmentary bits of data are assembled together by corporations to create what is deemed a "total" or "360 degree" view of the consumer, these views are often dynamic and evolving drawing from built in feedback mechanisms and human interventions. This paper focuses on the technological means of providing for particular consumer relations, suggesting that while consumers are produced in the discourse of marketing practices (literally created and signified in their digital representations), these simultaneously continually affect the databases of their production. Consumers and databases then are mutually shaped by means of technical feedback processes and social interventions, complicating the notion that consumer surveillance can be understood as a fixed information gathering to marketing process.

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9.5 The Traffic of Reproductive Technoscience and East Asian Modernities

Organizer/chair: Chia-Ling Wu
Department of Sociology National Taiwan University
clwu at ntu dot edu.tw
Adele Clarke, adele.clarke at ucsf dot edu
Dept. of Social & Behavioral Sciences, University of California at San Francisco, USA
Azumi Tsuge, tsuge at soc.meijigakuin.ac.jp
Department of Sociology, Meiji University, JAPAN

This panel aims to broadly explore and critically examine the traffic of reproductive technoscience and the formation of East Asian modernities through four coordinated case studies – the global IUD politics, reproductive tourism in South Korean, localization of abortion technology in Taiwan and reconfiguration of sperm separation methods in Taiwan. Instead of taking for granted the thesis of domination of Western technoscience, or the alternative thesis of autonomous East Asian cultures, we focus on the various encounters, negotiation and reshaping of social, cultural, economic, gender and ethnic formations along the development of network of reproductive technocience. We argue that through examining the complex processes of the travel of technosicenc between the West and the East Asia, and within East Asia, we are able to trace how scientific and technological practices become important sites for fabricating, linking and transforming local and global politics and identities.

Chikako Takeshita
Department of Women's Studies University of California, Riverside

Colonizing Bodies, Building Modernity: Science and Biopolitics of the IUD

During the 1960s, the intrauterine device (IUD) was embraced by population control advocates as a long-acting provider-controlled birth control method that would serve as the linkage among their ideology, government fertility limitation policies, and individual compliance to contraception. In essence, the IUD appeared to be the ultimate instrument of what Michel Foucault termed biopower, which would allow higher authorities to take direct control of individual fertile bodies without having to induce behavioral modification. Scientists' effort to perfect this technology was seen as their contribution to the effort to facilitate the process of putting economic modernization on track in developing countries by constructing modern, technologically managed, non-procreating bodies. The reciprocal relationship between Western political interest in managing Third World population growth and the scientific interest in the IUD coincided to create a technology imbued with political ideology. In this paper, I conduct a close reading of the scientific discourse around the IUD, exposing the scientists' desire to rule over foreign land through regulating the fertility of native bodies as well as their fear of encountering resistance against their interventions. Furthermore, I explore how the political artifact fared in its mission to produce modern states focusing on East Asian countries, where high rate of IUD use coincided with low fertility.

Young-Gyung Paik
Department of Anthropology Johns Hopkins University

Maternal Travelers and the Globalizing Clinics:

The recent stem cell research scandal and the arrest of international ova traffickers exposed the presence of well-established ova trafficking networks and the people involved with "reproductive tourism" in South Korea. It was publicly discovered that while Japanese couples were coming to Korea to seek egg donors and surrogate mothers, Korean couples hired ethnic Korean women from China for surrogacy or egg. Yet, the people in the dubious business of ova trafficking are not the only ones who experience reproductive tourism these days. For example, the so-called "childbirth expedition," on which pregnant women visit the clinics in the US territory including Guam and Hawaii in order to give birth to the US citizens, has even longer history in South Korea.

At the same time, it is not only the people or genetic material that are on the road either. As the number of babies born in the country has decreased due to the dropping fertility rate, some infertility clinics have ventured their branches into Mainland China and the US, and other hospitals have craved to lure Japanese and other Asian pregnant women for "childbirth expedition" in South Korea. Less innovative clinics have shut down, especially in the more sparsely populated countryside.

In this South Korean context, this paper introduces another kind of maternal travelers, who have no choice but to migrate to cities in seeking basic maternal medical care such as delivery rooms and obstetricians. By doing so, this paper argues that reproductive tourism is part of our everyday social world rather than an unusual and completely novel phenomenon. In particular, this paper will focus on how this new form of mobility has further stratified experiences of women in a globalized scene of reproduction.

Yan-Chiou Wu
Institute of History National Tsing-Hua University, TAIWAN

Uncertain Abortion— A Modern Story of Menstrual Regulation in Taiwan

Abortion remains illegal in Taiwan until 1984, but because the law was not effectively enforced and very few people were punished on abortion crime, both women and doctors actively used abortion technology to terminate pregnancy. In 1970, Taiwanese government promulgated Draft of Eugenic Protection Law in order to allow women with eugenic reasons to induce abortion. The Draft offended religious groups who wanted to protect "baby's" (fetus') right for life. They took actions to prevent the Draft from being passed and to call abortion murder. Moreover, technology of ultrasound has been introduced and used in obstetrics to make fetus visible and alive as living baby in order to impress the parents. However, for protecting their own economic profits and legal right, most doctors in Taiwan didn't consider abortion the way religious groups did. These doctors rather introduced new abortion technology than challenging the religious Pro-life

camp. For example, Dr. Fu-Min Chen, a famous obstetrician introduced Menstrual Regulation (MR) machine to Taiwan in 1974. MR is an operation to draw out organism from uterus to cure menstrual disorder, but also was used in early and uncertain period of pregnancy, so it was not easily regarded as an abortion operation. In this paper, I discuss how MR was introduced and performed in Taiwan during the its illegal period, and various actors negotiated with its uncertainty in terms of social, legal and clinical consequences.

Chia-Ling Wu
Department of Sociology National Taiwan University

The Taiwanese Sperm Separation Method:

This paper explores how the Ericsson method, a sex selection technology invented by an American scientist, has been reconfigured in Taiwan. Ronald Ericsson published the first paper in Nature on the method of in-vitro enrichment of the Y-bearing sperm in 1973. Together with artificial insemination, some early clinic reports showed a "success rate" of 70% to 80% of having baby boys. In 1981, Ericsson came to Taiwan to set up the franchise of Gametrics Ltd.; the method traveled to Asia for the first time. In the introductory stage, its local controversy mainly lied in the commercialization of medical knowledge, rather than gender discrimination. Since late 1980s, several Taiwanese inventors started to develope indigenous sperm separation methods, claiming their innovation better than Ericsson's. These Taiwanese inventors, none of them from prestigious medical institutions, actively demonstrated their superiority to the American invention, even before the scientific debates on the Ericsson method in English medical journals like Fertility and Sterility, and Human Reproduction in 1990s. While the medical society in Taiwan often referred to the latest English literature to deny the validity of the Ericsson method, one indigenous sperm separation method called 'Osmagic' remain stabilized. The inventor of Osmagic, a medical technician, successfully built the network through allying with prestigious medical doctors, patent, English publication, and its format of kit. Through analyzing the reconfiguration of sperm separation method in Taiwan, I discuss how professional identities intertwined with sex/gender system transformed and stabilized the sex preselection technology.

Adele Clarke (discussant)
Dept. of Social & Behavioral Sciences, University of California at San Francisco, USA

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9.6 Experimenting With "The Asthma Files"

Organizer/chair: Mike Fortun
Rensselaer Polytechnic Institute
fortum at rpi dot edu

This panel will examine the purpose, structure, content and possible futures of an on-going collective project called The Asthma Files.   The Asthma Files is a database of text, still images, video and audio that in some way illuminates the phenomena of asthma. It collects and projects multiple perspectives on asthma – from the vantage point of affected people in different locales and communities, heath care providers, and scientists from different disciplines. The Asthma Files include, for example, images of lungs annotated to describe how respiratory researchers think about lung function, and how asthma suffers experience an asthma attack. The Asthma Files also includes images of how genes express in allergic asthma; images of air pollution correlated to asthma hospitalization rates; and images that convey the extraordinary and socially uneven prevalence of asthma in different locales today. The goal is to help people visualize asthma as a complex condition produced through interaction between biological, ecological, social, cultural and political-economic systems. Papers will describe current and future components of the content of The Asthma Files, drawing out how understanding of asthma has changed over time, and been influenced by cultural, social, political, technological, and scientific developments.

This panel examines "many ways of knowing a particular object, project or event" (namely, asthma), and how some ways of knowing have been historically more valued than others. Papers also provide opportunities to reflect on what happens when different ways of knowing converge, and on creative use of electronic archiving and distribution capabilities.

Kim Fortun
Rensselaer Polytechnic Institute

"The Asthma Files"

WeAct, an environmental justice group in West Harlem, uses digital mapping (GIS) to correlate asthma hospitalization rates and sources of diesel pollution in their community, demonstrating environmental injustice.   WeAct's use of digital capabilities to connect otherwise unrelated phenomena has inspired a collective project called The Asthma Files. The Asthma Files is a database of text, images, video and audio that illuminate asthma, bringing together many different perspectives on asthma , especially those of affected people in different locales and communities, heath care providers, and scientists from different disciplines. This paper describes the design, aims and imagined futures of The Asthma Files, emphasizing our effort to design and use The Asthma Files experimentally, to promote new ways of understanding and communicating complex, politically-charged biomedical information. The design of The Asthma Files is informed by Marilyn

Strathern's arguments about the critical power of (ethnographic) methods that generate more data than investigators know is important at the time of collection, by Hans-Jorg Rheinberger's conception of experimental systems that are "designed to give answers to questions we are not yet able to ask clearly," and by Gregory Bateson's insistence on the importance of people understanding the complex systems in which they are embedded. The paper also describe an initial project using this content in a live performance, Nebulizer, in which video artist Surajit Sarkar and dancer/ethnomusicologist Tomie Hahn use the dancer's body as a projection space for images from The Asthma Files, showing how multiple forces converge in the asthmatic subject.

Rich Doyle
Penn State

Tuning The Breath Interface With Ayahuasca? Shamanic Itineration Among The Asthma Files

"Plant gnosis" is an epistemological effect noted with great regularity among ethnobotanists and anthropologists studying plant based medical practices of the Upper Amazon. Here researchers become subject to unusual and intensive symptoms of reflexivity, as when ethnobotanist Dennis McKenna received an immersive tutorial from a plant teacher, a "water molecule's eye view of the process of photosynthesis." Asthma is commonly treated with ayahuasca in the Upper Amazon, and in this contribution to the asthma files, this researcher reports on the correlation between reflexive practices of attention and breathing necessary to navigating the ayahuasca experience and his own observed healing with ayahuasca.

Mike Fortun
Rensselaer Polytechnic Institute

Care of the Data in the Genetics of Asthma

What makes it so difficult – scientifically, technically, politically, discursively – to study genes and the environment? Why, for example, do asthma researchers have easier access to the resources needed to study genetic determinants of asthma, than to those needed to study the environmental determinants of asthma? This paper looks at how studies of asthma are being designed to encompass both genetic and environmental determinants, with environmental determinants understood as both chemical and social. It examines how conventional ways of grouping populations (with racial categories, for example) in asthma studies are being challenged, or re-entrenched, by genomic approaches. This paper draws on collaboration with asthma researchers as they have developed gene-environment interaction research to help understand and respond to health disparities.

Aalok Khandekar
Rensselaer Polytechnic Institute

Measuring Exposure, Accounting for Asthma

Since the early 90's, transdisciplinary scientific collaborations among health and environmental scientists have been focused on defining and measuring human "exposure" to various chemical, social, and biological agents that cause chronic diseases such as asthma and diabetes in human beings. These transdisciplinary collaborations have resulted in the constitution of the field of "human exposure science." This paper will describe recent developments in this field, including a recent move to think about the field as exposure science, rather than exposure assessment or exposure analysis. This paper will also examine the implications that exposure science research will have for understanding asthma.

Tim Choy
Ohio State University

The Matter of Breathing in Hong Kong

How does air come to matter? This paper examines practices—both unremarked and intentional— that substantiate air as an object of knowledge and activity in Hong Kong. While there is no air in itself, I follow the lead of doctors, residents, and others in generating air as an aggregate category encompassing concerns about a number of things, among them difficulty breathing, dust, oxygen, dioxin, smell, particulate matter, visibility, humidity, heat, and various gases. Air functions in other words as a heuristic with which to encompass many atmospheric experiences. Accounting for the multi-layered quality of air's emergence allows for a better conceptualization of the challenges of politicizing diffuse substance and, more particularly, how asthma and accounts thereof turn air and its geographies from unnoticed banality to acute presence.

Discussant: Gregg Mitman
University of Wisconsin

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9.7 Technoscience in the Production of Contemporary Security Dilemmas

Organizer/chair: Kathleen Vogel
Cornell University
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Judith Reppy
Cornell University
jvr2 at cornell dot edu

This session will gather together STS scholars working on contemporary security issues, employing a range of methodological and topical perspectives. The panelists will examine the various "ways of knowing" that underpin the development of defense technologies and security policies in national and international security contexts.

Questions that this session will explore include: In a post 9-11 context, what new relationships are forming between the sciences and the security establishment? How are these emerging social and political orders affecting knowledge production on security issues? How are certain visions of the enemy and their technological capabilities embedded in the design and construction of new defense countermeasures? How are these visions also materialized within U.S. intelligence collection and defense policy? How does classification and secrecy affect how knowledge is generated, translated, and absorbed for policy consumption?

This session aims to engage with other STS researchers that are interested in contemporary security issues, and to open discussion on the role of STS in policy debates.

Judith Reppy
Cornell University

The Emerging Military-Industrial Biotechnology Complex

Six years after the 9/11 attacks and the anthrax attacks of October 2001, the contours of a new relationship between the biological sciences and the state are clearly discernible. In the United States new regulations for the conduct of research and the sharing of information have changed laboratory practices and publication protocols. New government funding has produced a four-fold increase in the number of NIAID grants for work on biodefense research projects since 2001 and a similar increase in the total federal funding for bioweapons preventions and defense. The U.S. government has lobbied other governments to adopt similar policies, especially with respect to control measures for research on dangerous pathogens (the so-called "select agents"). Not since the Vietnam War era has there been such involvement of biological scientists and firms in military work; it is a new experience for all except the most senior members of the life sciences

communities. This paper will analyze the emerging social and political order for the production of new knowledge about bioweapons and biodefense, with special attention to the economic stakes for universities and companies and their implications for the future of biological research.

Graham Spinardi
University of Edinburgh

Performance and Performativity: Understanding the Properties of the GMD Exo-atmospheric Kill Vehicle

Most of the debate concerning US Ballistic Missile Defense has centred on the adequacy or not of testing of the Ground-based Midcourse Defense (GMD). Critics argue that testing has been insufficient to demonstrate an effective system. Many of the flight tests have been failures, and it is argued that the design of flight tests has been insufficiently realistic, with most carried out over the same trajectories, against known targets, and with prior knowledge of intercept conditions. However, although testing is important, there is another fundamental issue that has been less well addressed concerning the design of the GMD kill vehicle. Intended to destroy warheads by hit-to-kill, the exo-atmospheric kill vehicle (EKV)design embodies a particular vision of how interception would take place. Although the 'rogue state' threat that provides the rationale for the GMD system would consist of a small number of unsophisticated warheads, the EKV technology, and its conceptual underpinnings, embody the assumptions of the Cold War. This historical legacy can be seen in the details of the EKV design and in its operational performance which is limited in ways that no amount of testing can change.

Ana Viseu
Cornell University

Personal Nano: Playing with biology/Designing Soldiers

Nanotechnology, often described as the manipulation of matter at the atomic scale, requires not only new instruments for seeing, and new ways of knowing. In this talk I will address how nanotechnology is transforming the ways in which biology, in particular, the human body is being address in nanotechnology research. I will do so by discussing preliminary results of an ongoing ethnographic study of the Institute for Soldier Nanotechnologies, located at the Massachusetts Institute for Technology. The institute is engaged in "personal nano" that is, applications to be used in or on the soldiers' body. My goal for this talk is the ways in which ISN researchers approach the bodies that they are designing for, what the meanings of "in" and "on" are, how these differ in discourse and in practice, and the bodies that are being reified and emerging in this initiative.

Dan Plafcan
University of Michigan

Understanding Energy Security in Comparative Perspective

This talk examines how policymakers and their expert advisers in three different national contexts projected understandings of energy security in debates about the construction and operation of petroleum infrastructure. In particular, the paper attends to how quantitative discourses about energy (e.g., statistics, modeling, econometrics, etc.) were brought together with largely qualitative discourses about national security (e.g., judgments of autonomy, power, risk, and threats). In the summer of 2005, amid a purportedly tight market for oil, the U.S. House of Representatives effectively quashed a buy-out bid from the China National Offshore Oil Corporation for the U.S.-incorporated Unocal oil and gas firm. The House determined that the sale would "threaten to impair the national security of the United States." China's rise also loomed over debates in Japan about Japan's and China's multi-year jockeying with Russia to determine the route for the first major pipeline to bring Russia's oil reserves in Siberia to East Asia, the Taishet-Nakhodka pipeline. In late 2004, Japan was able to secure a route to the Pacific, vis-à-vis a route to China, by offering its largest single international development loan to date, for over $7 billion. Finally, over the last two decades, the Nigerian National Petroleum Corporation has operated refineries to process imported heavy crude into various petroleum products. The chronic failure of these refineries is entwined with national debates about development and security. By juxtaposing these debates, this paper highlights how the merging of discourses concerning "energy" and "security" illuminates ways of knowing "energy security."

Kathleen Vogel
Cornell University

Imagined and Realized Futures of U.S. Bioweapons Threat Assessments

In February 2003, then-Secretary of State Colin Powell gave his now famous speech to the United Nations, laying the ground-work for the March 2003 U.S. invasion of Iraq. Using specially declassified intelligence information, Powell highlighted, with dramatic visual intelligence imagery, Iraq's continued development of biological weapons (BW) and the national and international security threat posed by this capability. Recent governmental and non-governmental investigations have revealed that the intelligence on Iraqi BW used in Powell's speech was not based on real human or signals data, but was largely constructed from threat visions imagined by the CIA and CIA-funded defense contractors. Yet, these realized imaginations served as the basis for important arguments made for the national and international justification for war. Although one could attribute this flawed assessment to an unfortunate and rare bungling of intelligence or a Bush Administration predilection for war, a closer look at US BW threat assessments reveals a more complicated picture involving historical and institutional factors shaping these assessments. In order to interrogate how such threat perceptions become realities, this

paper will ask the following questions: How are enemy bioweapons capabilities imagined within U.S. bioweapons threat assessments? What social machinery has created, sustained, and extended these conceptualizations within the intelligence and defense communities?

END

9.8 Mice and Men. Bodies in Experimental Sciences

Organizer/chair: Daniel Bischur
Univ. of Salzburg
daniel.bischur at sbg.ac.at

This panel will present glimpses of a "Body Turn" in Science Studies by looking at the presence, relatedness and meaning of bodies inside laboratories and how certain kinds of knowledge is embodied in them. Looking at bodies in experimental sciences opens up visions of the multiplicity of material objects, their various functionality and multiple perceptions in scientific action. Mice (pars pro toto various laboratory animals) and Men inhabit laboratories of the life-sciences. Since their bodily presence is a necessary precondition for laboratory action, it seems fair to take a turn towards them as bodies. Each actor – the animals and the scientists – performs as both subject and object of knowledge production. Animals are taken care of, are breeded, transformed and used as scientific material. Scientists use their own body as disciplined and trained tools for crafting data; furthermore their bodies serve as archives of experience – as "ways of knowing", as well as tools of measurement. Bodies in the laboratory also generate certain types of relation to each other. In multiple ways, bodies therefore have important roles in knowledge production and laboratory practice in life-sciences and should be discussed as ways of knowing, which themselves became part of cultural reflection in the literature.

Pru Hobson-West
Univ. of Nottingham

Knowing the laboratory animal: Boundaries, bodies and ambiguity

Defining exactly what separates humans from non-human animals has been an important task of moral philosophers for centuries. Writing about contemporary public perceptions of genetically modified animals, Michael (2001) stresses that we should not expect people to give consistent accounts. No matter how much ethicists try to clarify the essence of moral claims, he argues, there is still 'underpinning practical moral discussion a deep-seated ambivalence borne of the profound symbolic ambiguity of animal (and thus human) identities'. This point raises interesting questions, not just about identity, but also about the privileging of certain forms of (scientific) rationality or ways of knowing. Drawing on ethnographic literature and some preliminary data analysis, this paper discusses what happens when the symbolically ambiguous animal enters the laboratory, and considers how lab scientists - actors charged with producing new knowledge about human/animal boundaries - understand and negotiate the animal body.

Nicole Nelson
Cornell University

A Model Home for Model Mice: Environmental Enrichment and the Meanings of the Mouse Body

The body of the mouse as model organism represents many different kinds of objects all at once: it is a tool for research, a stand-in for the human body, an animal in its own right, and is often the embodiment of particular scientific theories.   This paper will use current debates about enriched housing for mice as a way of exploring the various understandings of the mouse body in biological research.

In the past ten years, there has been a resurgence of interest in the effects of the physical surroundings of laboratory mice.   Typically, mice are housed in standardized plastic cages, but recent studies have shown that mice housed in "enriched cages" – cages that are enhanced with bedding, toys and exercise wheels – perform differently than mice housed in standardized units.

Discussions about the merits of environmental enrichment for laboratory mice reveal very different understandings about what a "good" model organism should be. Some view mice as good model organisms because they provide a standardized source of tissue for research. In this view enriched housing is not only unnecessary, but adds unwelcome variables to experimental systems. Others argue that mice raised enriched environments are actually better models, because they more closely approximate the complex environments of humans. In turn, these debates reflect tensions in understandings of the human body that the mice are supposed to represent, and the degree to which social and environmental factors must be taken into account in modeling human disorders.

Hanne Jessen
Univ. of Copenhagen

Human-animal interaction and the role of emotion in laboratory science

The laboratory - in a wide sense: a network of places and discourses involved in the creation of biomedical science and knowledge - is an essential space in which humans relate to animals at all stages of the life-death trajectory of the latter, and in which humans and animals act and interact in diverse ways. Based on an ethnographic field study in such an "extended laboratory" in Denmark, this paper looks at practices involved in work with the animals (breeding, keeping, rearing, caring, trading, trafficking, operating, killing, dismembering, slicing, discarding, visualizing, interpreting etc.) and ways in which interaction with laboratory animals differ from or resemble interaction with important 'things'. Apart from being "artificial nature" and objects of and for science, laboratory animals have features that separate them out from mere scientific equipment. Do laboratory animals affect the production of science in decisive ways - ways that differ from those of technological instruments and human agency? As live beings who sense, move, act, socialize, express themselves and react to other beings

including people, animals to some extent set the stage for science - working with them not only involves measurable scientific procedures but depends on the senses and inevitably involves emotion. Do the characteristics of the animal as a live being demand or evoke specific knowledge, skills, emotions and attitudes on the part of laboratory people, and to what extent are such attributes individual and personal, situated and embodied, tacit or articulated?

Daniel Bischur
Univ. of Salzburg

The Scientists' Bodies in Action. Craftsmanship, Emotions and Attitudes towards Animals in Scientific Practices

Taking up the body turn in sociology this paper will elaborate the relationships between scientists and their material objects as they are embodied during scientific practice. Based on ethnographic data on a biology laboratory it will discuss this relationship from two different perspectives:

(1) The successful researcher has to be a skilled worker using her/his embodied knowledge for the process of tinkering towards the material transformation of her/his objects for data production. The researcher's body then is an instrument of measuring as well as a kind of archive of knowing. Her/his body becomes a disciplined (Foucault) instrument, which has its own place and function inside the laboratory. This embodied way of knowing has a big impact on the actual treatment of animals in experimentation, as it needs craftsmen skills to produce a model and care for it as an animal.

(2) Work with animals in the laboratory is necessarily dependent on the scientist's individual crafting skills and also her/his emotional perception of the animals' well-being. Attitudes towards animals in the laboratory setting (as well as elsewhere) is highly emotional. Nevertheless, following the literature of the sociology of the body, those emotional reactions still follow certain cultural patterns, which themselves can be understood as embodied ways of knowing "right" or "wrong".

As well as an instrument, the scientist's body can also be understood as a resource of emotional attachment towards animals. It is an instrument of performing transformation as well as one of caring for.

 END

9.9 Visual Ways of Knowing

Organizer/chair: Janet Vertesi
Cornell University <jav38 at cornell dot edu>

This session addresses questions of visual epistemology: how is knowledge made visible, and how is visual knowledge made? When visual knowledge is contested, what technical and social strategies are employed to reconcile opposing accounts? And when visual knowledge is made public, what technical and social interactions give such visions salience? Using case studies from 21st century visual technologies, the session brings together researchers who return to the essential questions of vision, knowledge, and representation in Science Studies.

Chad Harris <charris at weber.ucsd dot edu>
UCSD Department of Communication

Google Earth and the Omniscient Gaze

This paper will use Google Earth as a starting point for addressing issues of visuality associated with the growing popularity of satellite imagery and digital earth models, and will be based on interviews and recent research into the Google Earth community. How do digital earth models and application like Google Earth communicate knowledge of the world, while simultaneously being a source of pleasure for the casual user? How do satellite images constitute a particular kind of knowledge production that sits between visual cultures of science and culturally influenced forms of looking? Google Earth not only reveals objects on the ground, but produces them through regimes of classification and geospatial measurement, while also producing particular kinds of knowing subjects.

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Janet Vertesi <jav38 at cornell dot edu>
Cornell University Science & Technology Studies Department

"It's Too Red": the Construction of Visual Knowledge in the Mars Exploration Rover Mission

"This is what it would look like if you were standing on Mars". This phrase and others like it are used to explain and account for visions of the Red Planet as they are produced by the scientists on the Mars Exploration Rover mission. But such statements are laden with everyday social and technical practices that, together, construct images that are communally approved by the interdisciplinary team: whether as panoramic views of their robot's environs, or evidence of water on Mars. How do the team members reconcile opposing views of the surface, and how are such visions collectively achieved and stabilized? Based on fieldwork on the mission, the paper extends the theoretical framework of theory-laden drawing into the realm of competing epistemologies, exploring the expertise required to produce and reproduce sanctioned views of the planet.

Catelijne Coopmans .<c.coopmans at imperial.ac.uk>
Innovation Studies Centre, Imperial College, UK

Data, visuals and predictive ways of knowing in pharmaceutical drug discovery

The emergence of 'visual analytics' and other computerized visualization techniques spawns new questions about how data, visual displays and ways of knowing connect, and how these connections are made credible in practice. This paper investigates such questions in the context of early-stage drug discovery. Based on fieldwork and interviews with computational chemists and other research scientists in a large pharmaceutical firm, I describe the ways in which drug-like molecules are visually represented by scientists from different disciplines in order to predict their salient properties. What happens when chemical bonds, 3D fit and data plots meet and how is it that the molecules 'informed' (Barry 2005) by different ways of knowing do and do not add up?

Matt Ratto <matt.ratto at vks.knaw dot nl>
Virtual Knowledge Studio, The Royal Netherlands Academy of Arts and Sciences

Epistemic commitments, virtual reality, and archaeological representation

New technologies and methodologies are constantly being incorporated into archaeological practice. These tools foster new modes of engagement with older questions and the development of new lines of research. This makes them attractive objects for innovative scholarship. However, there are problems and dangers inherent in such adoptions. Among these is the possibility that some of the means of constituting and communicating knowledge that are particular to archaeology may be lost or, conversely, that the capabilities of new technologies may not be fully exploited. In order to call attention to the problems and the possibilities, this paper traces the creation and dissemination of an immersive, "virtual reality" pre-roman temple.

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UCSD Department of Communication

Picturing the Pieces: The Body in Images on the World Wide Web

Combining previous research in visual representations and medical imaging technologies with new methods for the analysis of visuals on the Internet, I argue that social assumptions about the science and anatomy of the body are carried through the structure, organization, and interconnectedness of visual representations on the Internet. For this study, I selected three educational websites for teenagers, created in the United States or United Kingdom, and referenced in the United States, Australia, and South Africa. As a whole, assumptions about the body appear to be embedded in an image's physical construction, stylistic devices and conventions, as well as in images' interrelationships. The technology of display affects accessibility, classification, labeling of images, and shapes how a user might interact with the images and

individualize their meaning-making experience. For example, each site uses a system of body classification as a user interface, no two alike. The presentations tend to reflect Western medical ideas of a mapped-out, standardized body with interchangeable and isolated parts, emphasizing part = name. The parts are related to one another primarily in space, rather than function. Assumptions of previous knowledge, particularly those of Western medical ideas, technology, and common behavior, appear to be prerequisites in order for a user to engage with the information for the greatest amount of understanding. Throughout the sites, as the visual and technological processes intertwine; they produce rather than reveal the body.

END

9.10 Hacking Knowledge

Organizer/chair: Renée Fountain
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This session looks at various but related aspects of making knowledge accessible and making accessible knowledge.

Jacques Daignault
University of Quebec

Hacking the virtual

This paper looks to seek out other actualization possibilities by setting free a bit of power from the virtual to bring about the unpredictable and the unknown that we desire. This thesis is largely supported by Stiegler's philosophy of technical evolution (in particular, the concepts of tertiary memory and adoption), by Agamben's state of exception and coming community theories, and lastly, by the work of Deleuze regarding the virtual and all that it entails.

Patrick Plante
University Laval

Hactualizing (technological) determinism

This paper look towards the hacker - specifically hacker ethics- for its privileged role at the heart of today's technology. It nd outlines a radical critique of technological determinisme as both method and finality.

Juidth Horman
University Laval

Social software collectives as agencements machiniques

This paper examines theoretical limitations in collaborative social software environments and proposes looking at social-technical knowledge production networks according to Deleuze and Guattari's notion of agencement machinique.

Renée Fountain
University Laval

Horizontal knowledge assemblages as impossible public goods

This paper endeavours to denote and promote pedagogical experimentations concerning a Free/Open technology called a "Wiki". An intensely simple, accessible and collaborative hypertext tool Wiki software challenges and complexifies traditional notions of - as well as access to - authorship, editing, and publishing. Usurping official authorizing practices in the public domain poses fundamental - if not radical - questions for both academic theory and pedagogical practice.

The particular pedagogical challenge is one of control: wikis work most effectively when students can assert meaningful autonomy over the process. This involves not just adjusting the technical configuration and delivery; it involves challenging the social norms and practices of the course as well (Lamb, 2004). Enacting such horizontal knowledge assemblages in higher education practices could evoke a return towards and an instance upon the making of impossible public goods" (Ciffolilli, 2003).

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Social Outsourcing or Sustainable Development: IT Enterprise vs. non-IT Enterprise in the Kudumbashree Mission

Can the expansion of social freedoms for indigent women cultivate sustainable economic development in the global south? Sen's capability approach emphasizes the importance of expansion of substantive personal freedoms over economic growth, arguing that the former is a necessary precondition of the latter. Development, in this sense, is achieved through the elimination of substantial sources of "unfreedom" such as political oppression, institutionalized lack of social power, and poor health and education services. The Kudumbashree Mission, a government owned NGO in Kerala, India, offers fertile

testing ground for this approach. Kudumbashree provides micro loans, matching government grants, professional training, and continuing social and professional support for women from below poverty line households interested in starting small businesses. Although the program has garnered recognition as a development success story, a closer look at its resulting enterprises reveals a contrasting picture. Kudumbashree supported enterprises providing IT-related services experience greater success than those providing other services. This discrepancy may result from the Kerala government's social outsourcing of IT needs to Kudumbashree enterprises. For this reason, Kudumbashree may be an illustration of the governmental benefits of social outsourcing rather than a sustainable development success.

END

9.11 Locating Grids of Intelligibilities and Situatedness of Knowledge and Knowing

Organizer/chair : Fouzieyha Towghi
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This panel explores the contested ways of knowing subjects (self and others), sites (clinic and non-clinical social spaces), and the body. How are epistemological grids, through which corporeal, social, and political bodies are observed, diagnosed, and treated, shaped and constrained by disciplinary methods, scientific and biomedical authority, and ethical claims? We consider the multiple forms of translation that take place and examine how variously trained and socialized observers (anthropologists, science and technology researchers, medical practitioners, midwives, and lay people) rework and contest these translations. Based on ethnographic research in transnational sites (Balochistan (Pakistan), Miami (US), Mozambique, and Taiwan), the papers in this session illustrate the multiple and varied enactments of the sociality of science.

Lauren Fordyce
University of Florida

Constructing "Vulnerable Subjects": Knowledge and Access

Recent work in medical anthropology has become complicated and enriched through science and technology studies, particularly as we recognize that the 'subjects' of our ethnographic inquiry can be constructed in multiple spaces. Yet, in the United States, our access to these spaces is becoming increasingly restricted as clinics become concerned with issues of privacy, particularly in the wake of recent HIPAA regulations. Clinical Institutional Review Boards (IRBs) are playing ever more important roles in controlling who has access to the clinic and for what kinds of research. Of particular interest is how clinical Institutional Review Boards construct 'vulnerable subjects' based on ethnicity and health status. Based on the work in urban clinics in South Florida and rural clinics in Haiti, this paper will ask: How does increasing concern over patient privacy and the clinical construction of 'vulnerable subjects' facilitate control over the kinds of knowledge created about and within the clinic? This paper will demonstrate how privileges of access change when doing research in South Florida versus Haiti and assess the dangers inherent in these relationships of power between the field and researcher.

Ippolytos Kalofonos
UCSF and UC Berkeley

A Vida Positiva: Activism, Evangelism, and Antiretrovirals in Central Mozambique

The HIV virus and the institutional apparatus that accompanies it around the world are vectors of social and biological change. Scholars working in this area have used the theoretical approaches of both medical anthropology and science studies to consider the local contours of a global pandemic. In this paper, I consider how clinical categories and social movements come together in local narratives of health and disease in my fieldsite in Central Mozambique.

Perhaps the best known research of social movements engaging in AIDS activism is presented in Steve Epstein's research, in which North American activists were able to shape the production of scientific knowledge around AIDS in the US. Strong social movements have directly engaged national and transnational researchers and policy-makers in Brazil and in South Africa and as well. In Côte D'Ivoire, Vinh-Kim Nguyen has written about how associations of people living with HIV/AIDS mobilized transnational networks to access antiretroviral treatment. These diverse cases can be viewed as instances of the co-constructions of science and society, with implications for the ways sufferers, disease, and clinical categories are politicized and socialized.

In central Mozambique, donor priorities and national imperatives drive an ambitious set of HIV/AIDS interventions highlighted by provision of free antiretroviral medications through the National Health Service. These standardized "best practice" interventions are localized in specific ways. Associations of people living with HIV/AIDS construct a moral and ethical seropositive identity and engage in local forms of activism and outreach using evangelical idioms.

Jennifer Liu
UCSF and UC Berkeley

Pure hybridity: identity and stem cells.

Contemporary scholarship suggests that identity is a contingent and shifting abstraction. In Taiwan, however, genomic science is being used to claim a material and historical basis for a unique Taiwanese identity, which in turn supports a particular political stance. Appeals to genomic science to know the truth about identity render identity as an irreducible material essence, erasing the myriad social, historical, political, cultural, and affective components of identity formation. Such identity claims are made in a relational frame which relies upon particular ideas about categories of self and other, sameness and difference, purity and hybridity.

Stem cells with uniquely "Taiwanese genetic characteristics" insert themselves into

discourses of purity and hybridity in relation to both "Taiwaneseness" and biomedical laboratory science. These scientists seek and claim a singular truth about identity; but identity is always already hybrid. Stem cell scientists seek a way to realize the hope of "pure" self-renewal in the form of autologous stem cell therapies; but stem cell purity relies on a series of prior hybridizations. In discursive and laboratory spaces, ideas about purity become increasingly polyvalent, and are mobilized in new ways in making both identities and stem cells.

Fouzieyha Towghi
UCSF and UC Berkeley

"Half A Person, Half Human": Particularizing Rural Women's Bodies to Normalize Injections and Hysterectomies in Balochistan, Pakistan.

Despite colonial and postcolonial state efforts to institutionalize and biopoliticize reproductive care of women, and to simultaneously interpellate trans-local midwives for this objective, a large percentage of births in Pakistan continue to take place outside of hospitals. In this paper, I address how routine injections of pharmaceutical drugs around childbirth and increased hysterectomies among women in Panjgur district of the Balochistan province are a consequence of the trend toward bio-medicalization of women's bodies and reproductive health care. These shifts in the medico-technocratic interventions on and inside women's bodies are linked to Pakistan's public health policy episteme to reduce maternal mortality. This policy frame overlooks high rates of hysterectomies in Pakistan, despite transnational recognition that women experience morbidities in the global South in epidemic proportions.

The medicalization of biopolitical (i.e. public policy) objectives, focused on the reduction of maternal mortality rates through safe motherhood and reproductive health programs, end up erasing broadly the role of global economic, social, and structural inequities that largely influence the reproductive problems of Pakistani women. At a more specific level, however, the standardization of hysterectomies (a transnational surgical procedure) and the routinization of the soochin (injections) around childbirth are a consequence of particular framing of the causes of maternal mortality. This is a transnational frame that holds a reductive view of women as fertile reproductive beings only, such that the necessity and dispensability of the uterus is a measure of its bio-scientifically and socially conceived bio--logical function and the prevailing limitations in medico-technical skills.

Thurka Sangaramoorthy
UCSF and UC Berkeley

Ethnography and Expertise in Clinical Settings: Rhetorics of Prevention and Progress in the field of HIV/AIDS

Anthropologists have had a long tradition of examining the production of local knowledge and practices and their cultural and social implications; in Science and Technology Studies, however, it is only relatively recently that discussions centered on consumer and lay knowledges and experience-based expertise have begun to proliferate. Both fields of study have much to offer each other, as investigations of biomedical knowledge production and practices move beyond laboratories and clinics, and into classrooms, streets, homes, and other public and private venues. Based on current ethnographic and epidemiological fieldwork in HIV/AIDS treatment and prevention programs that cater to Haitians in Miami-Dade County, this paper traces the complex movement of knowledge production and expertise among various constituents who work in the field of HIV/AIDS, including physicians, social workers, counselors, patient advocates, data managers, technicians, pharmaceutical representatives, and consumers. It focuses on the ways in which these individuals circulate ideas and technologies of HIV/AIDS across different fields. It also pays attention to how information about HIV/AIDS becomes entangled in the debates about relevant knowledge bases, and as a result, questions over expertise and authority. Furthermore, this paper confronts the implications of the positioning of the anthropologist as expert in clinical fieldwork. It discusses the various ways in which this anthropologist has had to negotiate expertise across multiple sites, embark on additional training, and demonstrate contributory expertise in order to gain entry to and sustain multiple fields of study.

Discussant: Charis Thompson
UC Berkeley

END

11.1 Hospitals and Technologies   Nelly Oudshorn (chair)
        Papers by Nelly Oudshorn, Ann Lennarson Greer, Nina Boulus, Alexandra Manzei,
        Marianne Tolar, Susan Erikson

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Emerging Ways of Knowing in Telemedical Care

In the last decade, the health-care sector has witnessed the testing and introduction of an increasing number of telemedicine applications in clinical specialties such as dermatology and cardiology. The novelty of these technologies is that they separate health-care professionals and patients by space: interactions are mediated through ICTs. Following Giddens, telemedical technologies can be considered as disembedded, abstract systems in which patient-doctor relations are lifted out from their local contexts and recombined across time/space distances. This paper explores how the introduction of telemedical technologies changes the ways of knowing in health care. What kinds of knowledge are created and valued or ne glected in care at a distance?   To answer these questions I will compare the health-care services provided by specific clinics for heart failure patients in The Netherlands with the emerging practices of care offered to these patients by a telemedical centre. How is knowledge constructed when face-to-face contacts between doctors and patients are replaced by virtual encounters? For health-care professionals working at telemedical centres, not seeing the patient implies finding new ways to make up for this absence. In this paper I will describe how careful listening to patients, particularly how they talk about their heart problems, how they breath, or 'listening between the lines' emerge as new techniques of knowing in these new intermediary organisations in health care.

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National Topics and Local Realities

It is generally agreed that the process of "voluntary" action that produced the American system of nonprofit hospitals yielded diverse organizations of considerable moral energy. Given the embrace of business practices by contemporary nonprofit organizations, there has arisen national debate as to whether their tax exemption, along with the public trust, continues to be justified.   These debates have directed research to investigation of the contemporary fulfillment of historic charitable purpose. There is a presumptive assumption that nonprofit organizations will excel or be perceived as excelling in their areas of historic concern. However, in adopting the language of the tax law debate, the managerial preference performance measurement, and the social science preference for generalizable findings, nonprofit research may have underestimated crucial developments that were shaping the sector. I report from longitudinal interviews conducted between 1975 and 2000 in twenty-five U.S. hospitals –the universe of

hospitals in one geographic region. Combining interview and archival data, I find the national vocabulary of "community benefit" had only minimal concern to most local hospitals. Rather they were concerned with survival and protection of organizational identity.   I explore these concerns in terms of alliances that reflected. historical identities, commitments, governance structures, and organizational cultures.

Nina Boulus
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Exploring the Construction Process of Technical Knowledge in the Healthcare Sector

Various technologies are being implemented in the healthcare sector, and this is followed by different degrees of enthusiasm and support. The importance of having sufficient sources for i.e. adequate technology and strong technical support has been increasingly acknowledged. Manuals and guidelines are provided to the staff, and training sessions are usually conducted during the initial phases of the implementation. After using the technology for a period of time, new technical knowledge is gradually accumulated and reinforces new work practices. In this paper, I will explore the process of knowledge in the making, and look at how it is actively constructed and continuously re-constructed? How is it eventually stabilized and made durable, or when is it rejected? How is knowledge translated to practice and how is it distributed across professional boundaries?

To address the following questions, I will draw upon an ethnographic research that focuses on the implementation of an Electronic Medical Record (EMR) in a community healthcare center, in Canada. During a period of more than one year, I participated in meetings conducted by a committee that was established especially to deal with various challenges faced with the EMR. During these meetings, EMR related knowledge is constructed in networks of practices, where a set of possibilities are explored and continuously accommodated to the situated and contingent work practices. Analyses from this study, point out to the significance of such meetings, which provide space for knowledge creation and distribution.

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Between Representation, Reorganisation and Control – The Implementation of ICT in Intensive Care Medicine

One of the most significant developments in health care over the last 15 years has been the wide spread of information and communication technologies. These technologies have a wide-ranging impact in every clinical section, on the clinical management and the accounting as well as on the work organisation, the professional knowledge of medical and nursing stuff and the patient's experience of illness. On intensive care units (ICUs) the implementation of information technology meets a very special context which from its beginning in the middle of the 20th century on was already highly technified. The

bodily signs of the patient are electronically monitored, controlled and visualized not only at the bed-site but also in the nursing room and technical devices like mechanical ventilation, dialysis equipment or other vital technologies are linked with this monitoring, too.

Since a few years now also the patient record is transformed in electronic data processing. Different to other non-critical wards, where this process is starting too, on the ICU electronic patient records are linked with the monitoring system as well. And – all together – this informational network is linked with the clinical management-information-system, too. That means this network is not only changing medical practice, diagnostic categories and the very consultation itself. The digitization process has also an extraordinary impact on the medical decision making process, because accounting and management criteria are now directly transferred into the former closed sphere of the ICU.

Relating to my ethnographical studies in the field of intensive care medicine I would like to demonstrate the impact of the digitization process on medical knowledge and personal experience and show how the medical and the nursing stuff is dealing with it.

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Documentation and "ways of knowing" in the healthcare sector: A comparison of electronic and paper-based patient record systems in an oncology setting

Documentation is an important part of the medical practice. In the healthcare sector it serves many purposes: workflow management, reporting and accounting, communicating with external units and services, doing research, ensuring accountability to legal and forensic inquiries, and providing overview of patients' trajectories. Especially for chronic diseases information about the long-term course of each patient's condition is crucial. When people receive treatments for many years a lot of data about therapies and examinations is gathered and has to be held accessible. The introduction of electronic patient records changes how information about a patient is stored and retrieved.

The paper presents results from a case study that deals with documentation practices in an oncology setting. In two hospitals in Austria extensive ethnographic fieldwork has been conducted to analyze work processes with special regard to documentation and the corresponding artefacts and procedures. In one of the hospitals they still use paper-based documentation whereas in the other one an electronic patient record system has been used for nearly fifteen years with constant adaptations.

By comparing the two regimes of record keeping the question is answered of how they influence what kind of information is accessible both from the viewpoint of the daily work with individual patients and of statistical analysis in the context of clinical studies or other (e.g. financial) evaluation.

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How Immutable a Mobile? Charting the Tenuous Ground of Obstetrical Science, Ultrasound Biometry, and the Diagnosis of Intrauterine Growth Restriction (IUGR)

Ultrasound, that ubiquitous tool of prenatal care, appears to easily qualify as one of those technologies that moves from one community of practice to another, transforming praxis and experience without being much transformed itself, what Latour has called an immutable mobile. For all its mobility, how immutable is ultrasound science really? How uniform are the diagnoses that result from ultrasound biometry, those fine measurements of fetal skull, arm and leg bones taken with digital calipers to determine whether a fetus is too small or too large for gestational age? Results from my ethnographic data indicate little uniformity and much variability in ultrasound biometry and ultimately obstetrical practice from hospital to hospital, country to country. Ultrasound biometry is the gold standard for assessing fetal size, and is used to diagnose everything from fetal intrauterine growth restriction (IUGR) to maternal diabetes. Ethnographic data from 449 ultrasound exams as well as interviews with ultrasound physicists, corporate executives, and sales people from Siemens, Toshiba, and General Electric indicate further that the formulas used to "crunch and diagnose" are numerous. In fact, before ultrasound machines can be used in prenatal care, their computer parts must be programmed, and IUGR-determining formulas must be chosen from a list of about 20 formulas. My interviews with sales people and obstetricians in Germany revealed IUGR formula country preferences ("The Japanese would never use the biometry formulas for IUGR preferred by the Germans") as well as preferences based on academic lineages falling along former geopolitical East/West German divisions.

END

11.2 Ways of Knowing Diseases
    Chair: Sharra Vostra
    Presenters: Sharra Vostra, Michael Orsini, Susan E. Bell, Kelly Joyce, Robert
    Smith, Gwen Anderson

Sharra Vostral
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Rely Tampons and Toxic Shock Syndrome: Mediating Technology and the Social
Construction of Disease

This paper examines the way that Rely tampons were designed and engineered by Proctor
and Gamble in the 1970s, and how this technology mediated the discovery and diagnostic
category of Toxic Shock Syndrome (TSS) in the early 1980s. By the time of the feminist
movement in the early 1970s, an estimated 80% of women wore tampons, with Tampax
produced by Tambrands selling more than any other. To cut into this market, researchers
at Proctor and Gamble abandoned the traditional material of cotton and instead designed
a tampon of polyester foam cubes and chips of carboxymethylcellulose, an edible
thickening agent used in puddings and ice cream, and marketed the new design as Rely.
Yet, the delivery of Rely tampons to women users helped to co-produce the medical
condition of toxic shock syndrome. Unfortunately, for some women who harbored the
bacterial strain Staphylococcus aureus, the wearing of Rely promoted its uncontrolled
growth, whereby the bacteria released toxins that in the worse case scenario led to a
woman's death. This paper examines how the science which led to the conclusion that
TSS was in fact a medical ailment was challenged by microbiologists working at Proctor
and Gamble, raising more than just collegial debate about the etiology of TSS. Proctor
and Gamble held political stakes in using sophisticated arguments to muddy the link
between the use of Rely tampons and TSS, leading to doubt about what we do and not
know about this relationship of disease to technology.

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Knowing the Autistic Subject: Neurodiversity vs. Access to Treatment in the Autism
Movement

From HIV/AIDS to breast cancer to asthma, citizens are increasingly using their ill status
as grounds for social movement claims against the state and society. This paper compares
the strategies adopted by opposing activist groups in Canada and the U.S. advancing an
autism agenda. One set of groups is appealing to the UN to have people with autism
considered a national minority that should be protected from discrimination, while the
other is trying to use the law to argue that the state has a duty to cover the costs of applied
behavioral therapy, which many parents of autistic children believe can 'save' their
children from autism. The first group, made up mainly of adult autistics, believes the

therapy can be harmful and instead espouse the view that people with autism are 'neurodiverse'; they are hard-wired differently than the average person. 'Curing' autistic people, they argue, would amount to destroying their personalities. The second group, in contrast, believes that withholding access to this treatment to parents who can not afford the prohibitive cost, is discriminatory. Canadian activists have made this argument, albeit unsuccessfully, in Canadian courts, suggesting that it violates the principles of the Canada Health Act. Further, they claim that neurodiversity proponents are partly to blame for the court's decision against extending state funding for behavioral therapy. This paper focuses on how legal subjects are constituted according to each view, and then explores the types of strategies that are implicated in the construction of the subject.

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Narratives and/in an Embodied Health Movement: Power, Knowledge, and DES

This paper traces the dynamics of an embodied health movement. It focuses on narratives and counter-narratives produced during an international, interdisciplinary three-day DES Workshop, sponsored by the National Institutes of Health in 1992 – a key turning point in the DES embodied health movement. Diethylstilbestrol (DES) is a synthetic estrogen prescribed to prevent miscarriage from the 1940s until the 1970s when it was identified as the first transplacental carcinogen by medical scientists who observed an association between prenatal exposure to DES and a rare form of vaginal cancer in women under the age of 20. The collective responses of DES daughters – and thus the emergence of this embodied health movement – began in the 1970s.

The 1992 DES Workshop brought together biomedical scientists, physicians and nurses, attorneys, legislators, and DES mothers, daughters and sons including the founding members of two DES activist groups. By analyzing stories told during the Workshop from the podium and the audience, and works of art about DES performed off the Workshop floor, it shows how doctors, daughters, and scientists make multiple knowledges and have multiple shifting voices in the production of knowledge. The eruption of subjugated knowledges during the Workshop was made possible by practices during the previous twenty years and led to the emergence of new pathways and relations of power and knowledge that continue to this day. DES narratives and counter narratives indicate how embodied health movements "work" and the concept of "embodied health movement" captures the collective and politicized identities of DES activists.

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Creating Chagas Disease:
An Analysis of How Biotechnology Companies, Clinicians,
Government Agencies, and Patients Contribute to Medical Knowledge and Practice

Chagas disease is a parasitic disease that affects approximately 16 to 18 million people worldwide. Although people with Chagas disease can be found anywhere in the world, most cases are diagnosed in Latin and South America. Until recently, Chagas disease received little attention in the United States. However, recent cases caused by organ transplantation and activities by scientific entrepreneurs have increased the visibility of the disease. In this paper, I trace how government agencies, clinicians, patients, and biotechnology companies create particular understandings of Chagas disease in the United States. Although each set of actors offers multiple ways of knowing the disease, I will show that the research agendas of pharmaceutical companies and the activities of biotechnology companies are potent forces that structure the creation and practice of Chagas disease. I will also demonstrate how clinicians—through their lack of knowledge about the disease—help produce the disease in practice. That is, Chagas disease is often invisible to clinicians and is frequently misdiagnosed. Finally, I will discuss how patients' views are often missing from biomedical accounts. Currently, successful treatments for chronic Chagas disease do not exist. I argue that the incorporation of patients' views can provide valuable knowledge that will enhance the quality of life of those who have the disease. The prevalence of chronic diseases requires an epistemological shift in biomedical practices—one that puts the lived experiences of patients at the center.

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Marketing Microbicides:

There is an urgent need for female-controlled protection options to combat sexually transmitted infections (STIs). Vaginal microbicides are chemical compounds that prevent or reduce the transmission of STIs, including HIV, herpes, chlamydia and gonorrhea. Candidate microbicides currently in development and clinical testing consist of intravaginal formulations that curb transmission by directly inactivating HIV; or preventing the virus from attaching, entering or replicating in susceptible target cells. Vaginal microbicides hold great hope of reducing the spread of HIV and other sexually transmitted infections, as they provide women with a female-controlled protection option.

The marketing, design and testing of vaginal microbicides thus far has been targeted primarily towards women. We argue that such thinking is limited and that, by ignoring men's needs and attitudes to microbicides, the burden of health responsibility will fall solely to women and may increase their vulnerability to HIV or other sexually transmitted illnesses. Avoiding the problematic assumption that microbicide usage is solely women's responsibility, we argue that men's attitudes to microbicides must be studied in their specificity in the hopes that this may help to illuminate how men's support for, and participation in the use of, this form of protection might be encouraged.

Demonstrating that men's responses to microbicides depend on a number of factors - including cultural difference, attitudes toward pregnancy, biological ramifications, and the nature of the relationship between sexual partner(s) - we propose a number of parameters that would be useful to the study of how to develop and market microbicides to men.

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A Theoretical Analysis of Medical Genetic Pedigrees Using
Bruno Latour's Actor Network Theory

(ANT) is used to analyze semi-structured interviews with 27 people in five ethnically diverse families who are at risk to familial breast cancer. These data disrupt the usual taken for granted assumption that scientized medical genetics pedigrees are the best tool for changing peoples' risk reduction behavior. Narrow and habitual ways of producing pedigrees can be overcome by expanding the social network of experts and incorporating multiple ways of knowing.

This technoscience analysis of the interview data focuses on four questions: 1) how has the medical genetics pedigree as a medico-scientific tool been changed by different actors in new social contexts? 2) what knowledge counts and what knowledge gets left out when medico-scientific genetic pedigrees are constructed? 3) how do actors get inside the network (or social system) that defines and generates 'expert' knowledge? 4) is it possible to increase the usefulness of the medical genetics pedigree by changing how it is constructed?

ANT is used to explore how the medical genetics pedigree came into being and migrated into new social arenas from genetic biology to: epidemiology, social psychology, medical genetics and genetic counseling, nursing, and public health genetics. By retracing how this technical tool migrated across professional boundaries and how it now links conversations across disciplines about disease, it possible to see how a new medical genetics tool can be produced that has greater use for the public in health care and community settings.

END

11.3 Ways of Sensing Biology

Organizer/chair: Stefan Helmreich
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How do biologists employ their senses to apprehend their subjects and objects of study? What kinds of biological knowledge sediment out of visual, tactile, auditory, and olfactory apprehensions — variously mediated — of the organic world? How have the senses themselves been imagined, modeled, and remodeled in biological research, and how has this in turn transformed ways of knowing in biology? More, how do the empirical practices of biological work press us to expand our catalog of senses beyond the canonical five to encompass such senses as kinesthesia (the sense of movement) and chronoception (the sense of time)? This panel takes up genres of biological research in which modes of sensing become explicit subjects for methodological meditation and innovation. Thinking through models of sensory transduction, synaesthesia, intersensorality, and zoosensorality, the papers on this panel press us to reimagine and refigure our assumptions and intuitions about biology as both flesh and discipline.

Natasha Myers
York, Anthropology

Molecular Happenings: Incorporating and Transducing the Molecular Practices of Cells

This ethnography examines the role of kinesthetic knowledge in constituting and propagating protein modelers' multi-sensate imaginaries of biomolecular worlds. How do researchers and their students use their bodies to figure out and relay intuitions about the textures, tensions, forces, and movements of protein molecules performing their otherwise invisible activities in cells? Attuned to the corporeal and affective entanglements between protein modelers and their lively substances, this study finds that life scientists conjure an elaborate figural vocabulary of gestures and affects to re-enact and enliven hypothesized molecular mechanisms. Narrating an "epic" re-enactment of protein synthesis on a football field in Stanford University in 1971, Nobel Prize Laureate Paul Berg remarked with delight, "It is not often that you get a chance to participate in a molecular happening." This paper investigates a variety of large-scale and impromptu molecular happenings; that is, re-enactments of molecular forms and movements, in what Berg calls "the dance idiom." Some life scientists have identified themselves as "anthropologists in the society of cells" and even "molecular sociologists." This paper proposes that molecular happenings produce a kind of Geertzian "thick description" that aims to discriminate between the "winks" and "twitches" of biological molecules through a kind of kinesthetic experimentation. In the process, molecular happenings not only refigure and animate the molecular practices of cells; such reenactments enable protein modelers to incorporate and transduce molecular movements in pedagogical and

professional milieus, in ways that make visible the productive possibilities of corporeal knowledge in the molecular practices of scientists.

Sophia Roosth
MIT, History, Anthropology, Science, Technology, and Society

The Chance of Life-Time: Biological Temporality and Chronoception in Synthetic Biology

Synthetic biologists, inspired by computational architecture, aim to design standardized biological parts ("BioBricks") that can be assembled into complex biotic devices and systems, ushering in an age of biological Taylorism. How do synthetic biologists sense and intervene into biological temporality? In this paper, I focus on MIT synthetic biologists' attempt to refactor bacteriophage T7 as an example of how the design of synthetic organisms accounts for biological time. The T7.1 project — and synthetic biology more generally — demonstrates how biologists' and engineers' different conceptions and expectations of "life" get built into synthetic organisms. While engineers approach synthetic biology as a means of "biological disenchantment," biologists anticipate that biological things are lively — that they escape the expectations of predictive computer models and experimental protocols. Using a term gleaned from one of the principal scientists who synthesized T7.1, I call biologists' learned capacity for surprise "respect for the organism," and refer to the technique that attempts to disenchant the organism (and concurrently opens up a space in which organisms may demonstrate their lively contingencies) as "zeroing out" biological temporality. The temporality synthetic biologists engineer into novel organisms is one that is modeled on computational architecture: biological models mimic the linear time built into digital models of biotic systems. Synthetic biologists' chronoception collapses representation and life — T7.1 certainly animates the sum of experimental knowledge of T7, but it is also a viable embodiment of that biological knowledge and an intervention into life that upsets and recursively elaborates the logical connection of theories to things.

Michael Rossi
MIT, History, Anthropology, Science, Technology, and Society

Corpus: Porpoise

In July of 1903 an expedition from the Smithsonian Institution returned to Washington D.C. bearing death casts of a seventy-eight-foot long blue whale taken at a whaling station in Newfoundland, Canada. The model made from the casts caused a small sensation in the mass press of the period: "for the first time an opportunity is given to the public to look upon the most gigantic of existing creatures," declared an article in one newspaper. "The first and only authentic portrait of a whale in existence," affirmed another, "life sized and exact to the minutest detail." For the public to "look upon the most gigantic of living creatures" with confidence as to its scientific accuracy, however,

required a leveraging not of the visible, but of the tactile: a properly vetted scientist applying plaster to cetacean; a skilled sculptor revisiting dead whale in life-like papier maché; an audience overawed by the physical presence of the largest creature on earth, hanging improbably out of arm's reach on tightly-stretched piano wires. This paper explores tactility and sensuality in the public science of early twentieth century America. Drawing material from archival sources and contemporary periodicals, I use whale bodies as stepping-off points (diving boards or planks) to examine those other senses deployed as alternative metrics of scientific truth in the face of subjects which at every turn confounded attempts at visual nomination.

Sara Wylie
MIT, History, Anthropology, Science, Technology, and Society

Olfactory Representations and Interventions: A Proposal for Sensing Volatile Organic Chemicals

This research explores the difference between olfactory and visual sensation through the development of a sensor for ambient levels of volatile organic chemicals. Rather than providing a visual or auditory alert for the presence of volatile organic chemicals, this sensor produces scents. Using this product as an ethnographic instrument, I explore how olfactory versus visual stimulation affects users' emotional and physical response to alerts. This project hopes to promote non-expert involvement in the formation of scientific knowledge by enabling non-experts to build, monitor, and record information on potential pollutants in their environments. This project hopes to explore the potential for theoretical work in STS to inform the technological design and development of tools for science and activism. Grounded in field work on natural gas development in the western United States, this project hopes to extend ethnographic work on how people come to know and relate to their environment by providing a cheap, easy-to-build, at-home sensor for harmful organic chemicals that, by virtue of its olfactory alert, stresses the physical interaction between the body and potential pollutants. Exploring the dynamic and potent questions of how we physically engage with our environments, this project both theoretically and materially examines how our sensorial engagements affect our political and scientific engagements.

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Tensions between established practice and changing technologies: Marine mammal scientists and digital photography

New technologies have consequences, both anticipated and unanticipated, when introduced into social settings such as scientific organizations. While technology does not determine patterns of change, technology can function as one actant among many by affording uses and behaviors as a result of embedded features. This paper will explore how one technology, digital photography, has acted as a catalyst for changes in marine

biology that extend beyond photographs into many other technologies and social practices. The data in this paper were gathered at ten research sites in 2006 and 2007.

Marine mammal scientists use photographs to identify and track individual animals such as whales and dolphins. Since 2004, most switched from film to digital photography. For many scientists, this choice became a catalyst for many other changes. Additional permanent staff were hired to deal with increasing volumes of data. Databases were designed for photographs, but also incorporate GPS, environmental and other field data. Automated animal identification programs are being developed. Even more technological sophistication may be on the way, as scientists attempt to build field collection packages that combine these functions and more for immediate data integration using boat-based equipment.

Even with all this promise of sophistication, however, many of the actual practices of the marine biologists in this study are still fairly low-tech and manual. Practices developed over many years shape the technologies, and conflicts between these practices and the limits of available technology are regularly negotiated. This paper will report on this tension between established practice and ongoing change.

Richard Doyle
Pennsylvania State University, English, Science, Technology and Society

END

11.4 Author Meets Critics: Steve Fuller's *The New Sociological Imagination*

Organizer/chair:
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Steve Fuller's *The Sociological Imagination* (2006)updates C. Wright Mills' *The Sociological Imagination* by taking into account a number of intellectual and social changes that have occurred over the past fifty years. These include the intertwining between biological and social themes through history, the challenges posed by the new biology, a globalized world and the clash between secularism and fundamentalism. In this session, Fuller will respond to the critics of his new book.

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Critical Commentary on _The New Sociological Imagination_
Discussant on "Author Meets Critic Panel"

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Critical Commentary on _The New Sociological Imagination_
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Response to my Critics
Discussant on "Author Meets Critic" Panel

Zaheer Baber
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Discussant _The New Sociological Imagination_
Chair and Organizer, "Author Meets Critic" Panel on Steve Fuller's _The New Sociological Imagination_

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 END

11.5 Gender and Technology
    Roli Varma (chair)
    Papers by Roli Varma, Marja Vehviläinen, Karen Tonso, Vivian Anette Lagesen,
    Frances Bronet, Alison Powell

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Women in Computing: The Power of Geek?

This article examines geek mythology - the high-tech, andocentric, sub-cultural milieu -
that is often blamed for women's underrepresentation in and attrition from the
undergraduate studies of computer science (CS) and computer engineering (CE). Based
on in-depth interviews with 150 male and female students from five major ethnic/racial
groups at seven Minority-Serving Institutions, this study indicates that the pressure to
conform to the geek ideal is not as important a factor for non-White female students at
these institutions as it has been found to be among White female students at prominent
non-minority institutions. The paper proposes that contextual-institutional and student-
demographic factors constitute variables that must be taken into consideration before one
can discern how heavily geek mythology figures in women's decisions to leave or remain
in CS/CE studies.

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Textual Frames for Situated Agency in ICT: Gendered ICT Expertise in Policies,
Newspapers and Novels

The paper's point of departure is in a series of studies on user participation in ICT and
citizens' gendered agency in ICT mediated society in Finland, and it traces – through an
institutional ethnography -- cultural relations that persistently undermine the situated
knowledge and situated gendered agency of these groups. Social and cultural differences
are increasing, including ethnicity and literacy, intersecting to gender, age, class and
region, found previously in the rather homogenous Finnish society. However, ICT
expertise prevails white, male and engineering dominated both in media representations
and in ICT educational programmes and professions, and citizens' situated knowing is
not articulated publicly, not even in electronic forums. The analysis of the paper focuses
on widely available textualities. Daily newspapers (three month periods in each year
2005-2007), policies of information society (1998, 2006), and novels on ICT businesses
(7-10 published in 1995-2007) each give access to the cultural relations organising the
ways of knowing and interpreting ICT expertise. The policy and newspaper texts present
a landscape of an extremely networked society where the public sector is strongly linked
to the private and where politics and business is run co-operatively, with little room for
the ones outside these networks. The novels complement the picture by describing all

male expert cultures in ICT businesses seeking for increasing profits in the 1990s. These excluding cultural relations are discussed from the point of view of knowledge and agency of citizens who are otherwise absent from these texts.

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Masculinities, Femininities, Engineering Practice: Complicating the Gender Equation in Engineering Education

Drawn from a large-scale cultural study of an engineering campus, this paper details variations in, interconnections among, and co-construction of masculinities and femininities among student engineers. In particular, it illuminates how gendered performances of the kinds of selves that counted as engineers intersected with, and were framed by, engineering expertise. Rather than student engineers enacting a binary set of gender forms – man and woman, men expressed several forms of masculinity, some in ascendance over others, thus embodying relations of power aligned with campus preferred forms of engineering expertise. A far smaller constellation of femininities was made salient on campus and, via enculturation processes for becoming an engineer, femininities were systematically distanced from forms of engineering expertise, markers of affiliation that signaled belonging as an engineer. Among men and women demonstrating the same form of engineering expertise, men were in ascendance. But, among men, those practicing the campus-preferred academic-science form of expertise held sway over men practicing a more robust form of expertise closely aligned with capabilities needed for industry work. In fact, design-engineering expertise became devalued as un-scientific, in spite of a campus rhetoric purporting to value such expertise. This, then, suggests how an academic knowledge system – the widely accepted U.S. engineering curriculum – was made salient in a local context and contributed not only to a complicated calculus of power relations involving both gender and engineering expertise, but to a devaluing of the knowledge and skills needed for engineering practice.

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Beyond people-skills and technical skills: Exploring gendered epistemic machineries of software work

Working conditions, learning and career opportunities has more often been studied with organisational lenses rather than with epistemic. While learning and career opportunities are related to features of the individual company/organisation, they are also influenced by a broader shaping of definition of competence, standard tasks and symbolic content. The concept of epistemic machineries are useful tools to uncover different mechanisms of institutional, symbolic and practical character that regulates working conditions and career options for men and women in particular set of jobs. This paper explores the

various gendered epistemic machineries of software work in three different settings, Norway, Malaysia and California.

Frances Bronet (U of Oregon)
Linda Layne (Rensselaer)
Teaching the Design of Feminist Technologies

Beginning with the premise that technologies are a form of legislation (Winner), Bronet and Layne discuss the potential for design as a means for changing gender politics. Drawing on their experiences of leading an NSF-funded interdisciplinary design workshop for faculty at the University of Oregon and teaching undergraduate Product, Design, and Innovation students at Rensselaer, Bronet and Layne discuss the challenges and opportunities for integrating feminist goals into a design curriculum. Analogies are drawn with the successes of sustainable design and design following the American with Disabilities Act.

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Configuring the Researcher: Partial knowledge in grassroots technical production

The development of open-source software and other grassroots technology projects appears to replace the institutional design process with iterative, fluid assemblages of humans, code, and machines. Yet the organization of these assemblages reinforces certain notions of expertise, especially the expertise of the software developer, who is most often male. Whereas institutional design cultures have integrated a diversity of practices and people into the design process (see Suchman, 1987), grassroots development opposes the structures that make this integration possible. Thus, while women with expertise in non-technical areas like usability or sociological research often work as part of technical development teams in industry, women with these skills are conspicuously absent from grassroots technical development projects.

This paper reflects on my participation as a non-technical "social science" researcher in a grassroots, community-based technical development project involving open-source software development. As a woman and non-technician, my role and knowledge were destabilizing to the project. For the other developers, and in terms of the final software project, I was configured both as a token and as "one of the boys" – both inside and outside the development process. This position mirrors the position Haraway (1991) describes as "partial perspective" – the necessity (and ability) to see non-objectively. With such a partial perspective comes partial knowledge: a non-technical female participant in an open-source project configures the product, but she is also configured by what she does not know. How then is the researcher configured? What can she see? What can she know?

END

11.6 Designing "Big Stuff": STS and the design of large technological systems

Organizer/chair: Ulrik Jørgensen
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Big stuff, or: large technological systems – large and important parts of our environments such as city infrastructures for water and energy, airports, bridges separating crossing means of transport, urban metros, highways and healthcare systems among many more – are designed and built by humans. They are the result of long processes of planning, engineering, construction, implementation and operation. These endeavours are by their very nature political in many ways: They entail large scale impacts, for example, they make part of the life of nations, and they structure social activities and technologies by their material scripts and their very distribution of agency among the involved actors. They involve a very large number of people, professionals, companies, and distribute the role to users and operators. They also structure and define the types of knowledge involved and the boundaries and limits to the knowledge and problems at stake within the involved 'communities of knowledge' – even by also explicitly excluding some, as entailing impacts is not neutral.

In the STS tradition, the work of Thomas Hughes and a number of other scholars has approached the study of big stuff using the analytical metaphor of 'technological systems'. Scholars in this tradition have also reviewed the efforts of e.g. engineers and planners in the US and elsewhere to build a theory of systems with the explicit aim of tackling the design of big stuff and the problems of cities, regions and countries. The limits to these approaches have been demonstrated as well as the role of systems theory in organising large scale efforts. Another strand of studies have been focusing on the complexity and heterogeneity of technological systems and even demonstrated the mere idea of a single systems approach is even dangerous as it restricts the ability of operators, professionals, and users to establish different ways of building knowledge and handling these large scale systems.

A Voss(1), R Procter(1), R Slack(2), M Hartswood(3), M
National Centre for e-Social Science, Univ. of Manchester and others

Building Generic Infrastructures for Research: a quest for the treasure

This paper is concerned with the development of e-Infrastructures for e-Research and the ways in which a common set of standards and middleware systems can potentially come to underpin activities as different as particle physics and anthropology. Recent work by

Pollock and Williams (forthcoming) on the ways in which systems developers go about creating 'global' or 'generic' systems focuses attention on the strategies that are used to distill common requirements and tame the potentially wild contingencies of local use as described by earlier studies on localisation. Work by, e.g., Timmermans and Berg or Hanseth and Braa has already made the important step of pointing to the reflexive tie between local uses of technologies and their 'universal' recognition and diffusion. However, what is missing from these accounts is 'just how' people involved in the development of generic systems realise their project of creating something that will enjoy wide uptake and universal recognition while being effectively usable and useful in local settings of use. Drawing on case studies of the development of Grid technologies and existing studies in the area of e-Science (e.g. by Hine and by Venters), we aim to explore how e-Infrastructure for research is being realised in practice and to draw lessons for how the vision of a comprehensive research e-Infrastructure of might be practically achieved. In drawing wider lessons we believe it is important to attend to the ways that the development of large-scale research infrastructures impact on the formulation of research projects, and how infrastructures are themselves, in turn, impacted upon by developments in the application areas.

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Pavement failure in Transmilenio: knowledge, responsability and agency

During the period 1998 to 2000 the first mass bus rapid transit system of the world was designed, built and put into operation. The first phase of this project, called Transmilenio (which impacted directly 12% of the daily 7.000.000 trips in the city), included the re-design and re-building of the pavement of the main corridor of the city in terms of public transportation: Avenida Caracas and Autopista Norte. For the new buses that would carry 160 passengers and would weight 30 tons at full capacity a concrete pavement was designed. The infrastructure was designed for a useful life of 20 years. Nonetheless, by the end of 2001 began to appear failure in a few slabs in the corridor. During 2002 the number of slabs that failed increased alarmingly and by March 2003 the failure, which impacted the operation of the whole public and private transportation system of the city, became a national scandal. Hearings were scheduled at the Senate where former Major Enrique Peñalosa –who promoted and retains credit as the father of the rapid transit system– admitted political responsibility for the failure. Nonetheless, he pointed out, the technical and financial responsibility should be assigned to the designers of the system. The scandal faded away and the responsibility was diluted in a maze of cross accusations between public officials, engineering contractors, consultants and designers, international experts and the public itself. STS analyses suggest that when systems are designed agency and responsibility is assigned to different actors. The instability of the arrangement of actors is revealed when failure happens, which demonstrates the incomplete character of such arrangement. Examining the case of the failure of the concrete pavement in the 1st phase of Transmilenio we aim at recreating the political and technical dynamics that assigned agency and responsibility to the concrete pavement itself and the character of the knowledge that supported the decision to design it wi

Birgitte Munch, Ulrik Jørgensen
Kolding Design School, Technical Univ Denmark

Constructing users and distribution agency – the design of the 'Great Belt Link' in Denmark

The 'Great Belt Link' is a combined bridge and tunnel providing means for cars and trains to cross on of the most trafficked water ways in the world – the Great Belt. The construction of this bridge and tunnel is of course an engineering achievement concerning the mere construction of its parts and form as such a large complex technological construct. But what makes it into a heterogeneous technological system is the multiplicity of build in technical parts and the security measures and operated security systems involved both concerning the road and rail traffic and especially the handling of the ship traffic through the sound and pathway under parts of the bridge.

The paper focus on the extension understanding and professional knowledge to make the security issues an object to be handled in systematic ways as safety measures and systems. In this construction process not only new technologies were employed but new ways of understanding risk and sailing behaviours had to be developed as well as the distribution of agency among the different parts and elements of the total system including the construction of surveillance and communication procedures for operators and pilots. By building on the idea of liminal knowledge and analysing the heterogeneity of the system parts involved the construction becomes an example of how the design of large and complex technological systems challenge conventional models of technology and engineering knowledge and practice.

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Guiding the Invisible Hand: Designing Wholesale Electricity Markets in the U.S.

Deregulated wholesale electricity markets in the U.S. were intended to replace planning by providing price signals that would "incent" desired investment in generation. They have not been successful in this meeting this objective, and system operators fear the result may be a system that is unreliable due to insufficient power generation to meet peak demand. Most markets have addressed this problem by establishing capacity markets, in which needed generating capacity is procured through competitive auctions, and the costs are passed on to consumers. However, the capacity markets have remained controversial, and have undergone continual redesign. This paper examines the work of economists involved in designing these markets in two of the large regional wholesale markets. Rather than designing markets that are efficient in terms of economic theory, the economists propose designs that will be politically efficient, that will generate prices that all participants will regard as the product of impersonal market forces.

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Another Chapter in a Long Tale of Helping Themselves: Local High Speed Internet Solutions in Rural and Small-Town Alberta, Canada

To overcome the "digital divide" between rural and urban areas, the provincial government of Alberta, Canada, in partnership with two private corporations, built a high speed broadband network to connect government offices, schools, healthcare centers, and public libraries across the province. While direct SuperNet connections are available to these institutions, the network also benefits individuals and other organizations in the province. Internet service providers can buy bandwidth on the SuperNet to provide high speed Internet access to residents and businesses, which is particularly valuable in rural areas where it was previously unavailable. Despite considerable initial interest by private companies in serving rural areas, ethnographic fieldwork in rural Alberta found that some areas remain without high speed Internet service. This presentation, part of a larger dissertation project, explores the variety of rural responses to the lack of private high speed service provision, including municipal initiatives, societies, and other unique local solutions. Additionally, it investigates how rural people explain private companies' lack of interest in providing service. The paper argues that rural residents view the local provision of Internet service as yet another example in a long history of rural communities having no option but to provide required or desired services themselves; a situation that is akin to the establishment of rural telephone cooperatives in the 1930s when Alberta Government Telephones could no longer afford to provide expensive rural lines.

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11.7 Risk, Environment, and Technology
  Chair: Michael Mascarenhas
  Presenters: Michael Mascarenhas, Keith Warner, William Kinsella, Nathan
  Young, Pierre Delvenne, Kuei-tien Chou

Michael Mascarenhas
Rensselaer Polytechnic Institute

Indigenous Health, Environmental Inequality, and Drinking Water Regulation in Ontario,
Canada

In the aftermath of Canada's worst public drinking water crisis, when in May of 2000
more than 2,000 people became seriously ill and seven people died from *E. coli*
contamination, new provincial water regulations have done much to ensure the safety and
confidence in the provision of public drinking water. In grounding new testing practices
in "good science" performed by "credentialized" technicians, the new regulations
established clear risk assessment protocols and environmental audit-type practices with
which to ensure the safety of this previous environmental and human resource. However,
as recent water contamination in the northern Ontario Cree community of Kashechewan
illustrates, this techno-scientific approach has done little to improve the drinking water
conditions of Canada's First Nations communities. This paper examines the new public
management regime of drinking water services in Ontario, Canada, and its effects on
First Nations communities. Based on two years of fieldwork both on and off reservers, I
argue that this techno-scientific approach to water management has not addressed the
health problems and quality of life burdens associated with poor drinking water
conditions on Canada's First Nations Reserves. This is in part because this approach
continues to separate the technical knowledge-making practices of water pollution from
social hierarchies and power relations between Canada's native and non-native
populations.

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How does the public know about biological control? Ethics, trust, and scientific
communication in ecological pest management

Classical biological control – the importation of arthropod natural enemies to control
pests without pesticides -- is inherently a public interest science practice, and thus
biocontrol practitioners depend on public support (financial and political) for their work.
The discovery of some nontarget effects of arthropod biological control prompted some

ecologists to assert that releasing beneficial insects is inherently risky, unacceptably so. Just what constitutes acceptable risk in balancing pest management and the prevention of nontarget effects is high contentious. A hybrid scientific community must come to some form of consensus on the character of the risk and the responsibilities of practitioners before government agencies can provide effective regulation. In the case of nontarget effects of biological control, actors cannot agree on how best to manage risk in the public interest, which further muddies mutual understanding between scientists and the public. How capable is the public of knowing the science and risk of an arthropod release, and how important is understanding relative to trust? This presentation reports on research in California and Canada to examine how a hybrid scientific community and the public understand each other, or fail to.

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Knowing Environmental Risk: A Critical, Constitutive Approach to Risk Communication

This presentation offers a critical, constitutive framework for the analysis of environmental risk communication, incorporating perspectives from communication theory and from European sociology. As an explicitly critical approach, the framework emphasizes the inherently political aspects of risk communication and related issues of organizational and institutional power. It does so by adopting a constitutive model of risk communication, in contrast to prevailing representational, informational, and persuasive models. I begin by examining the historical origins of prevailing models, identifying their epistemological limitations and the associated consequences for scientific validity, public policy, environmental justice, and cultural constructions of the relationship between humans and nature. Building on that critique, I develop an alternative model linking phenomenologically-grounded, constitutive theories of communication with the risk society perspective of Ulrich Beck and the functional systems theory of Niklas Luhmann. Although the communication discipline has recognized the general relevance of Luhmann's work, and to a lesser extent Beck's, and those authors have written extensively on issues of ecology, risk, trust, and power, the connections between communication theory and their perspectives on ecology and risk have not yet been adequately explored. This presentation seeks to facilitate that exploration by focusing on the discursive constitution of environmental risks, understood as an illustrative category within the broader field of risk communication.

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Ralph Matthews, University of British Columbia, ralph.matthews at ubc dot ca

Experts' Understanding of the Public in a Risk Controversy

This paper reverses the usual emphasis in studies of 'public trust in science' to examine how scientists and other experts understand public participation in controversies over scientific claims. Our analysis is based on a survey of over 500 experts in Canada involved in knowledge-production about aquaculture (N= 301; response rate of 60%). Aquaculture – the commercial 'farming' of aquatic species – is a significant controversy in Canada, with proponents arguing that the practice represents a "blue revolution" of safe and sustainable animal production, while opponents argue that the industry poses grave environmental and human health risks.

The survey was administered to experts on all sides of the issue, including scientists employed directly by industry and environmental groups, as well as academics and government-based scientists. The aim in this paper is to examine experts' understandings of public "contributions" to the controversy across three dimensions: (1) stakeholder participation, (2) the media as an interpreter and communicator of expert claims, and (3) the knowledge and values basis of general public opinion. We find that experts' views on the public swing from strongly positive to strongly negative across these dimensions. To elaborate this ambivalence, we turn to some key qualitative data which suggests that experts on all sides of the controversy look to 'enroll' local knowledge or input into existing scientific claims or processes in the interests of legitimizing arguments for or against aquaculture. In doing so, experts envision a very specific role for local and stakeholder knowledge as complimentary to existing claims and/or science-dominated processes.

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Ways of Knowing Under Great Scientific Uncertainty: The Electromagnetic Fields Case Study in Belgium

Our guideline is to point out how some specific groups of stakeholders refer to different ways of knowing any particular problematic in some situations of great scientific uncertainty, like for the effects of the electromagnetic fields.

We propose to analyze several focus groups to obtain information about various people's opinions and values pertaining to a defined topic. By observing the structured discussion of several interactive groups in a permissive, non-threatening environment, we also try to differ the stakeholders' main ways of knowing in a context of scientific uncertainty from the situations where the science's voice is taken for granted. The rise of the "non-scientific" explanations to risky problems has to be taken into consideration on the one hand by the scientist who tries to clear the fog about scientific controversies, and on the other hand by the decision-maker who sometimes has to act proactively or preventively to adapt to the transformation of the political and scientific cultures of our current societies.

We argue that in some particular contexts, the relationships of three categories of people – the "citizens-stakeholders", the scientists and the decision-makers – need to be rethought. Using an indicated participatory approach, we aim to highlight the news ways of knowing a globally threatening issue yet to be resolved.

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Reflexive risk governance – a critical view of "bring the state back in"

In confronting all kinds of challenges in the process of globalization, the cry to "bring the state back in" is being raised again. It is expected that the government can well ably play the role of risk regulator to enhance the capacity of risk governance. Taiwan or East Asia countries, as a newly industrializing country, due to its distinct historical background, technocrats still play an influential role in terms of the theory of the developmental state. They are highly authoritative and autonomous either in technological or in risk policy decision-making.

The purpose of this paper is to critically reflect decision-making problems in developmental states that deal with disputed and sensitive policy. The main focus of analysis centers around a discussion of authoritative technocratic expert politics, and of its inner conflict and challenge of transformative risk governance regarding risk and technological policy, for instance, global food risks, GMO, stem cell research, , nanotech and so on.

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11.8 ICTs, Social Networks, and Communities:
  Marianne Ryan (chair)
        Marianne Ryan, Smiljana Antonijevic, Anne-Mette Albrechtslund, Murali
        Venkatesh, Dana Walker, Dylan Wittkower, Clifford Tatum

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Implications of the Sociotechnical Infrastructures of Virtual Worlds: An STS Perspective

This research addresses emergent sociotechnical affordances of virtual world
infrastructures and what they may foreshadow in terms of the postmodern
decentralization and unbundling of infrastructural services within the physical world.
Virtual worlds are immersive, persistent, online environments in which people interact
for entertainment, commercial, and/or educational purposes. The project examines an
innovative virtual world, known as Second Life, which serves as a case study for
applying infrastructure theories. As a boundary object between both real and virtual
worlds, Second Life's infrastructural code presents certain constraints and affordances
that affect the experience of residents within its world and beyond. Second Life also can
be understood as an infrastructure that supports second-order large technical systems
created by residents themselves. This analysis reveals how user agency and contingency
play important roles in molding the infrastructure of Second Life.

The technical architecture of Second Life's infrastructure helps shape social and power
relations within that virtual world. However, iterative reinterpretation, reinscription, and
transformation of such infrastructure influences subsequent events as well. The hybrid
roles of user/designers in virtual worlds offer important lessons for developing next-
generation cyberinfrastructure. As user needs and virtual world infrastructures continue
to co-evolve, they suggest real-world solutions to improve the design and maintenance of
complex cyberinfrastructure projects which share several critical features with virtual
worlds. Insights gained from engagement with environments such as Second Life indicate
that virtual worlds can be productively deployed as experimental testbeds in which to
challenge current theories of infrastructural development, and to incubate new ones as
well.

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Second Life, Second Body: A Microethnographic Analysis of Nonverbal Communication
in a Multiuser 3D Virtual Environment

This paper presents results of a six-months long ethnographic research of nonverbal
communication (NVC) in "Second Life" (SL) virtual environment. A randomly selected

set of 107 locations provided a wide range of communicative contexts. Segments of naturally occurring communication were recorded, and then analyzed using the method of microethnography. The study was focused on proxemic and kinetic cues; other pertinent nonverbal code-systems have been considered.

The results point to a significant difference between user-generated and predefined (system-generated) NVC. User-generated NVC was observed in the use of proxemic cues, such as interpersonal distance and body orientation. This type of NVC had an important role in: communicating interactional intent; structuring interaction; and, sending relational messages. User-generated NVC was closely related to co-occurring verbal utterance; it was not significantly correlated with the users' physical appearance (human or other) and gender, or with the communicative context. Predefined NVC was identified in gestural and postural configurations. It was used rarely (gestures) and/or involuntarily (postures), with no specific relation to co-occurring verbal discourse. Predefined NVC was highly context and gender dependent, providing a set of stereotypical nonverbal acts.

NVC observed in SL is a field of tension between two types of embodied knowledge. User-generated NVC, although often consistent with social norms in the physical world, shows a high-level of adaptability to the symbolic system of the analyzed environment. Predefined NVC is bound to a set of gender and culture-biased nonverbal acts. Aimed at enhancing naturalness of user-interaction, predefined NVC fails to achieve its function.

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Ideological representation in computer games

My paper is based on the idea that computer games as simulations can be seen as a new kind of aesthetical realism forming a certain perception of reality and thus certain ideological statements. These statements can be found in the structural shaping of the games, in other words the rules, gameplay and constitution of the virtual space. The investigation thus concerns the constitution of the virtual space in games and its ideological effects or statements, and in this paper, I am specifically interested in uncovering to what extent sexuality and erotic dynamic play a part in the spatial constitution, gameplay and context of The Sims 1 and 2 (Maxis 2000, 2004). The Sims, being an immensely popular game and a 'pioneer' within the prevalent genre of simulation games, can be seen as representing general tendencies in computer games, and therefore the study of this game should offer overall insights into the ideological aspects of gaming.

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On re-stabilizing artifacts

Why do stabilized artifacts become de-stabilized? The Urban-net project, a broadband civic networking initiative in New York, was launched in 1996. The network went on-line in 2000 when its technological infrastructure was stabilized through a governance structure and service contracts. Service contracts were expected to be renewed in 2005-06. By late 2006, users were unsure about renewing and the network was at a crossroads. We analyze why, after five years of stability, the network is at risk. Urban-net managers are exploring two strategies to re-stabilize the network. First, they hope to assure the network's continued viability by tightly coupling (more tightly than hitherto) the Urban-net infrastructure with user sites' ICT infrastructure and institutionalized practices that rely on it. Second, to empower themselves by re-positioning the neutral meetpoint. The meet-point (network access point) comprises electronic devices located at a neutral site where competing service providers can establish a presence. At present, the meetpoint is used predominantly by one provider offering a limited range of services. Urban-net managers wish to assert the meeetpoint's centrality to the network in order to expand users' access to services/resources beyond those currently available, hoping thereby to persuade them to stay on. This is the network externality strategy. Then there is the political calculation: by inviting multiple service providers in, they hope to leverage the resulting competition to strengthen their hand in contract negotiations. Our analysis of re-stabilization efforts is motivated by sociological accounts of path construction and agency. We have tracked the project since 1996.

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Ways of Knowing Local Issues – Distributed Information Practices in Local Blogs

Phillyblog.com, a Philadelphia-based online forum started in 2002, was founded with the vision of an "online community [to] become an idea-generator, or basis for action in our real community - for people to take ownership of their comments and ideas on the board, and make our community better by starting their very own mini-movements." Since its inception, the site has grown to approximately 12,000 registered members with three to four times as many guests. To date, those members have written nearly 410,000 posts and created about 28,000 new conversation topics. Posts run the gamut from debates about the upcoming mayoral election to the promise and perils of online dating in Philadelphia. Some, including a few in the Philadelphia media, have been skeptical about the role of a forum like Phillyblog – trivializing the kind of discussions taking place. Others, including contributors to Phillyblog, claim that the forum is a place for "real people" to write about topics of "importance to themselves and others." The questions raised by the Phillyblog example are important ones. Can posts that discuss the merits of mayoral candidates as well as where to find "cute girls" be described as a way for people to understand local issues? I argue that, though on the surface much of the conversation taking place on this local blog would not be traditionally viewed as political, there is some evidence to

suggest that networks of issues that are relevant to residents are forming and that those networks may be different (and often trivialized) from issues identified or recognized by the local media.

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The Sociality of the Interface: Consumer Electronics and the (Un)Concealment of Community

Adorno and Horkheimer claimed that "[the culture industry's] prime service to the customer is to do his schematising for him," or, in other words, that among the functions which consumer goods perform is their pre-voluntary construction of experience. Adorno and Horkheimer argue this with regard to the culture industry as a whole. Here, I consider only one market – consumer electronics – and only one aspect of this schematization; that which concerns our conception of self as more or less bound up with community. In this connection, the primary concern is the device interface, whose progress is measured in terms of fluidity and transparency. This means the interface is inevitably parasitic upon pre-existent representations of function and process, as the interface that needs to create its own symbolic system is deemed an obtuse failure. Hence, interfaces either draw upon isolated or social activities, and draw upon these activities either in a preemptive or open manner. This four-quadrant classificatory scheme allows us to make sense of why it is (on the one axis) that some consumer electronics are open to community-building and why others engage in repressive tolerance of communities, and why (on the other axis) whatever social isolation which may be brought about by technology is apparent to the user to varying degrees. In illustrating this classification, we can also engage in a brief typology and assessment of current trends in interface design, including features such as voice command, anthropomorphism, and the unexpected role of cuteness.

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Title: Co-production of Knowledge in the Emergent Middle Media –
Towards a New Framwork.

Abstract: There is much hype about the production and sharing of user
content in this second generation of Internet applications, or what
some call Web 2.0 (O'Reilly, 2006). One need only consider the
phenomenal growth of projects such as Wikipeida and Youtube, or any of
the issue related networks in the blogosphere, to imagine the
expansive change in how people interact with media rather than simply
consume it. As we access and consume media on the Internet, we also
contribute to its organization and therefore engage in a form of tacit

knowledge co-production. This can occur either as an organized effort
or as the result of the self-organization of multiple actors
interacting in a common space or about a common topic. In other words,
co-production occurs both as explicit or intentional collaboration and
as the unintended aggregate of individual interaction within a
network. In both cases, the use of networked information and
communication technologies for collaborative projects gives rise to a
middle media (Bennett, 2003, Bimber, 2005). Distinct from the top down
flow of mass media, the contemporary media ecology is increasingly
influenced by the vast majority of media users and consumers of middle
media applications (such as blogs and wikis, as well as media
repositories Flickr and YouTube). To be sure, the knowledge products
of the middle media are increasingly displacing more traditional forms
of knowing. In this paper, I propose a framework for the examination
of knowledge co-production on the Web, with a particular focus on the
middle media. I consider a variety of web topologies that range from
the individual information service, such as Google or Wikipeida, to
networks of individual blogs, which are interlinked around an event or
an activity such as a political campaign and/or collective action.

END

11.9 Funding and Publishing in Science:
Chair: Nicholas Chrisman (U Laval)
        Papers by Nicholas Chrisman, Yuri Jack Gómez-Morales, Beate Elvebakk, Kenji
        Ito, Suzanne Laberge, Carlos Saldanha Machado, Aaron Panofsky

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Interdisciplinary networks and the flavors of money

Research is a complex enterprise with many folkways that have accumulated through practice over the past century. Forms of research support (grants, contracts, prizes, etc.) come with various kinds of expectations from the funding sources. Some sources demand cost-sharing, or "leverage" from additional sources. These arrangements vary geographically and between disciplines (communities of practice). Roughly speaking, these rules establish a complex regime of the "flavors of money", a topic rarely raised in formal studies of science. Yet, the flavors of money provide real barriers to certain kinds of effort and make other easier. Presumably some of these rules arise from particular policy objectives of the funding organizations, but frequently they appear more to be a heritage from past decisions dimly remembered. The interaction between the formal rules and what is actually practiced also offers much room for discussion. This presentation will provide a viewpoint on the different categories of funding from the perspective of the Scientific Director of a Canadian Network of Centres of Excellence. The GEOIDE network undertakes interdisciplinary research at 32 Canadian universities with connections to similar funding organizations in Australia, France, Mexico, and the Netherlands. The presentation will also include some experience with funding arrangements in United States, France and Great Britain. From this empirical base, some elements of a theory of the flavors of money should emerge.

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MEASURING SCIENCE AS DEVELOPMENT: THE USES OF BIBLIOMETRICS IN COLOMBIAN SCIENCE POLICY-MAKING.

The institutionalisation of science as a developmental goal has been a lasting and significant presence in science policy discourse and practice for about half a century in many Latin American Countries.

My aim in this paper is to try to understand how one of these policy agendas, in the practice, implements the science for development project; to do so, I will examine an specific agenda which focuses Colombian scientific periodicals as negotiated development target.

In advancing the science for development agenda, bibliometrics has proved to be a strategic resource enabling a generalized space of equivalences for relevant actors involved in the administration, funding and execution of scientific research. Bibliometrics is able to do this by providing definitions of science and scientists that make it easy to render them accountable through the quantitative assessment of their products. By translating science itself into a measurable object bibliometrics endows policy-makers and administrative personnel with argumentative resources for bridging the gap between scientists' internal expertise and policy-making external concerns: Bibliometrics legitimises the process of allocation of resources within COLCIENCIAS' research system in so far as its standard measurements are presented as objective and unobtrusive representations of science. Second, bibliometrics systematic mediation between relevant actors within the system becomes an effective mechanism for standardizing a community of practitioners into a disciplined community of producers. And thirdly, in so far as bibliometrics standards are believed to be universal, the normalization of bibliometrics within the research system serves COLCIENCIAS to render itself accountable for top international developmental agencies.

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Disciplinary publishing cultures

Academic publishing has largely been transferred to digital media, although most journals still publish in paper form. In early days of online publishing, there were widespread expectations that the move to digital format would change the academic publishing cultures, and also the form and content of the publications (Guedon, 1996 Odlyzko, 2000). On the whole, however, the changes to publication practices and journal formats seem to be rather limited (Nentwich, 2003, Mackenzie Owen, 2005).

Simultaneously, source materials have also to a large extent been digitized, transforming relationships between the academic, the publication, and the "data".

Publication cultures do however vary markedly between disciplines, and should not be discussed as one phenomenon. Publications play various roles, and serve different functions in different epistemic cultures. It is my contention that these differences are highlighted by the changes associated with the shift to digital media. This paper compares the publishing cultures in the disciplines of law and astrophysics, on the background of the increasing digitization of publications, communication and source materials.

The paper will discuss differences between publication practices, and also changes in these practices associated with digitization. It will also address the role and function of academic publications in the two disciplines and mechanisms for selection and certification, and how this influences choice of medium.The paper is based on interviews with university academics in Oslo and Amsterdam.

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"Big History of Science": A large scale oral history project of a big-science laboratory in Japan

This paper argues that introducing some practices in big science can benefit a certain kinds of research in science studies. It examines an on-going large scale oral history project on an accelerator laboratory in Japan called KEK. The project was launched in 2004 at the Graduate University for Advanced Studies (Sokendai), and it has come out to address some of relatively new science studies concerns. For example, this project attempts to break away from the conventional laboratory studies in the 1990s by paying much more attention to the outside of KEK, especially the laboratory's relations to local communities. Instead of focusing on elite scientists, the project aims to shed light on roles of technicians, secretaries, graduate students, and wives of scientists. At the same time, however, the project contains some features not always present in science studies researches. Being inspired by practices in high energy physics, this project is an attempt to construct a large "instrument," namely an organization to collect and preserve oral history interviews. As in accelerator science, developing and constructing this "instrument" is considered to be a scientific achievement in itself. As is often the case in high energy physics, resulting research papers will have a long list of authors. Such practices engender some tension with existing approaches in science studies. Yet, this paper argues, such a "big history of science" project might be instrumental in revealing some aspects of a large laboratory that evade conventional solitary approaches to science studies.

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Attitudes towards funding agencies' encouragement of interdisciplinary research: the cases of biomedical, clinical and social scientists

Interdisciplinarity seems to be the new creed of funding agencies in Canada. Many have engaged in restructuring processes in order to intensify interdisciplinary and collaborative research. For instance, the Medical Research Council of Canada was replaced in 2000 by the Canadian Institutes for Health Research (CIHR) in order to promote interdisciplinary research (IR) on a wide range of health determinants. However, there is no empirical evidence that this trend was intended to meet the needs expressed by health scientists. The goal of the research project was to investigate biomedical, clinical and social scientists' perceptions of the challenges, benefits and downsides of IR, and of the funding agencies' new plea for IR. Semi-structured interviews were conducted with 31 biomedical scientists, 29 clinical scientists and 33 social scientists. Results indicate that a majority of scientists show an ambivalent attitude regarding the greater heuristical

potential of IR as compared to disciplinary research. The three groups of scientists have expressed distinct rationales in support of their stance. The differences reveal the hierarchical structure of the health research field. Moreover, a large majority of scientists believe that funding agencies are promoting IR too strongly, at the expense of disciplinary research, and that IR should be driven by researchers' scientific agendas. Among the mentioned undesirable impacts of the new craze for IR is the increased number of artificial interdisciplinary teams. Results are discussed in light of the power struggle over the regulation of the health research field.

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LOCAL TRANSPOSITIONS OF INTERNATIONAL MODELS: ANALYZING AN EXPERIENCE IN HEALTH R&D POLICY IN LATIN AMERICA

The purpose of this study is to analyze the induction policy on health research and development (HR&D) of Oswaldo Cruz Foundation (Fiocruz), the largest Latin American public biomedical research academic Institution. One of Fiocruz mission is to produce vaccines and medicines for the Brazilian public health system. Historically, Fiocruz technological production base is derived from international corporations technology transfer. Nevertheless, in the last seven years, Fiocruz is funding biotechnological capacity building policies to promote vaccine and medicine research and development for "non-profitable" infectious diseases, a deficient and "low value" market. Such policies involve implementing a set of strategies such as: technological developments in inputs, organizing and structuring internal and external collaborative networks, technological platforms and flexible laboratories. Empirical evidences points out that the adopted model is in harmony with the policies established by countries with high performance in biotechnology. Nevertheless, the model presents dissonances not only with Fiocruz organizational and administrative structure - hierarchical departments, extensive bureaucratic procedures with weak ties – but also with the bioscience academic research, dedicated to production and circulation of codified knowledge. Therefore, the study aims to identify and systematize: (1) the strategies adopted to deal with these dissonances; (2) the transposition of models of coordination, technologies production and information flowing through the collaborative networks, technological platforms and flexible laboratories. We adopt a qualitative approach that triangulates data from open end interviews, documental analysis and ethnographical observations.

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Scientific Status and Publication Bias in Biomedical Research

Publication bias occurs when decisions about whether or how research is published are not independent of the results reported, a phenomenon well documented in the field of biomedical research. The publication bias literature focuses on factors surrounding the publication process, such as the perceptions of authors, editors, and reviewers and the characteristics of manuscripts. To the extent it has considered contextual factors, these have been limited mainly to the effects of industrial funding on the findings reported or authors' decisions to publish. This paper presents results from a study that tries to fill in the picture on the sources of bias by looking deeper into the contextual factors that may shape whether or not particular studies appear in print. It focuses on the effects of researchers' social positions in the scientific field to look at publication bias as (in part) the unintended consequences of the status seeking strategies of relatively low-status and marginal scientists who are more desperate to publish in prestigious journals; who have more difficulty acquiring funding, and thus are liable to become dependent on funding from interested funders; and who are less well integrated into the research enterprise and thus less affected by its norms. The paper discusses preliminary evidence for these hypotheses gathered from a data set which consists of the publication decisions and primary authors' status attributes for a complete cohort of manuscripts submitted to three major biomedical research journals during a four month period in 2003.

END

11.10 IT Software and Infrastructures
	Chair: Steve Sawyer (Penn State)
	Papers by Steve Sawyer, Stuart Mawler, Yuri Takhteyev, Byoungsoo Kim, Floortje
	Daemen, Honghong Tinn, Ralph Schroeder

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Cyberinfrastructure, data rich fields, and data poor fields

The growing interest by many scientific societies and funding agencies such as the U.S. National Science Foundation in developing cyberinfrastructure motivates this talk. The attention to developing a common, domain specific, computing infrastructure that supports sharing, storing and working with digital data is driven in part by the growing concern that many scientific fields are being overwhelmed with data. This data deluge arises in part because of the abilities of new sensors and digital data collection instruments. For example, the rise of the internet has made some areas of information science data rich, even as other sub-fields like user studies remain data poor. My argument is that the exhilaration of developing seamless cyberinfrastructure to support data rich fields focuses resources on volume without attending other value choices and social conflicts. As basis for this discussion, I contrast the current trends of two sub-fields of information science: information retrieval and user studies. Studies of internet users remains a data poor activity even as data about the internet is rapidly proliferating. Much of the research time and resources is spent gathering data, whereas in information retrieval the structure of the Internet and web, and current data harvesting tools, are such that information retrieval has become a data rich field (a much different situation than 15 years ago). In contrast to all that is being learned about retrieval, the poverty of data on user's activities limits the ability of these scholars to contribute to scientific and public understanding. A poverty of data also makes it difficult for user studies scholars to discriminate among existing theories and build a cumulative science, even as it allows for many quasi (or pre)-theoretical attempts to flourish. The lack of shared data sets forces scholars to shift much of the research funding towards data collections, often leads to where research teams hoard data and to situations where multiple – and often incompatible – forms of data being collected, and makes it difficult to share and build the kinds of large-scale data sets that allow for community-wide engagement. This contrasts with data-rich fields. In these areas of study the theoretical choices are more limited and often more steadily tested, possibly because large amounts of data allow for extensive theoretical testing and the pruning of weaker theories. However, base assumptions are less-often scrutinized. Scholarly attention in data-rich fields turns towards data-sharing, tool building, and the other elements of Kuhnian normal science. If developing cyberinfrastructure is to be a goal for the near term, then debates on the design and uses of these computing ensembles must consider the value choices and

differing needs that differentiate data rich and data poor fields. Moreover, if the goal is to become a data rich field, scholars in data poor fields should consider developing both larger (and shared) data sets and the tools to explore these, and turn away from quasi-theoretical proliferation.

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Executable Texts: Programs as Communications Devices and Their Use in Shaping High-tech Culture

This thesis takes a fresh look at software, treating it as a document, manuscript, corpus, or text to be consumed among communities of programmers and uncovering the social roles of these texts within two specific sub-communities and comparing them. In the paper, the social roles of the texts are placed within the context of the technical and cultural constraints and environments in which programs are written. Within that context, the comments emphasize the metaphoric status of programming languages and the social role of the comments themselves. These social roles are combined with the normative intentions for each comment, creating a dynamic relationship of form and function for both normative and identity-oriented purposes. The relationship of form and function is used as a unifying concept for a more detailed investigation of the construction of comments, including a look at a literary device that relies on the plural pronoun "we" as the subject. The comments used in this analysis are derived from within the source code of the Linux kernel and from a Corporate environment in the US.

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Foreign Knowledge in the Work of Brazilian Software Developers

The paper looks at the experience of software developers (computer programmers) in Rio de Janeiro, Brazil and their forms of engagement with the larger world of software development. Software developers working in Rio de Janeiro, Brazil, find themselves at a periphery of a global professional world in which they must strive to assert membership. Claiming such membership and displaying their links to this global world is important both for competition against other local developers as well as for maintaining an image of proper representatives of the profession vis-a-vis both local clients and potential foreign collaborators. The display of developers' global links, however, must be carefully balanced against the need to maintain commitment to the local community of developers, which can neither be fully embraced nor rejected. Resulting tensions are partly alleviated through careful rhetorical work that places the foreign and the local into different domains making it possible for the developers to be simultaneously "local" and "cosmopolitan." The paper will be based on 50 qualitative interviews with software developers in Rio de Janeiro conducted over the course of 5

months in 2005 as well as additional interviews and participant observation to be conducted in Spring and Summer of 2007.

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Development and implementation of knowledge sharing infrastructures; characteristics and considerations of use.

The production of (scientific) knowledge has grown enormously over the last decades. Solving the problems of today's society often require integration of many types of data and knowledge. Consequently, knowledge sharing networks are considered to be of increasing importance. This specifically applies to the field of ecology, as it is characterized by complex interactions between physical, biological and social research. In the Netherlands, the use of IT is being explored for supporting the access and sharing of knowledge. Many initiatives are undertaken to develop ICT based infrastructures, such as 'The Netherlands Biodiversity Information Facility', the National Data Repository Flora and Fauna and 'Ecogrid'. The development of these infrastructures is very much technology driven, despite the fact that these infrastructures are not only or mainly a technical problem, but also very much a social design problem (David, 2003) with epistemological implications (Van House, 2001).

This paper will explore the historical development processes of different knowledge sharing infrastructures in the field of ecology in the Netherlands. This paper is based on the analysis of several separate infrastructures, each in the field of biodiversity. The paper will answer the following questions: what are the characteristics of the ICT based infrastructures for knowledge networking in ecology and how have these infrastructures been developed and implemented. Which specific issues were taken into account when creating a knowledge sharing network? The contextual factors influencing the emergence of the knowledge sharing infrastructures are taken into account as well. The lessons learned from this analysis can be generalized to other fields, where similar interactions occur.

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Exploring the History of Computers in Taiwan from 1970 to 2000-The Do-It-Yourself Computers, Commercial Districts of Electronics Products, and the Popularization of Personal Computers

This project will explore the history of personal computers in Taiwan from 1970 to 2000 with a focus on self-assembled computers, which have accounted for approximately 40% of all computer sales in Taiwan since the early 1990s. The so-called "no-brand," "self-assembled," "Do-It-Yourself," or "white box" computers were first built by retail stores

with computer parts from newly-emerging companies. This kind of companies is original equipment manufacturers which had produced parts for companies with big names, such as IBM and HP, since the late 1970s. Now, users build their own computers not only for a slightly lower price and enhanced capacity but also for showing off technological savvy and for helping friends. This project will provide an alternative historical explanation of the popularization of PCs by showing the links among the industrial manufacture of computers, the lay culture of tinkering technological products, and the inscription of the lay culture in the city space—two commercial districts located in Taipei similar to Akihabara in Tokyo and Yongsan Electronics Market in Seoul.

Responding to the recent academic attention to the co-production of technology and users, this project will illustrate that in addition to manufacturers, various users and social groups are critical in shaping the physical making and cultural meanings of technology. In the field of the history of computing, this project demonstrates the social history of computing whose relative absence from existing research reflects the long-standing emphasis on the development of "pure" technological hardware and software, particularly as it evolved in Western society.

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Defending Technological Determinism – In Theory and in Practices

In recent decades the sociology of science and technology has been unanimous in arguing that science and technology are socially shaped or constructed, and thus in rejecting technological determinism. This paper argues the opposite: One of the most outstanding features of modern societies is the uniform and cumulative impact of science and technology, which is therefore not shaped by particular societies or social circumstances - but rather shapes them. A 'realist' notion of science and technology is developed, following Hacking, which is applied not only to scientific and technological development, but also to the endpoint of 'use' (practices). The paper is illustrated throughout by a comparative-historical account of two countries, Sweden and America, tracing the trajectories of practices and focusing in particular on the role information and communication technologies (ICTs), which are divided into political and leisure or consumption uses. The paper puts forward a theory of how, in these domains, ICT's have cumulatively changed the relation between political and media elites on one side and civil society on the other, leading to a more mediated – but also more socially 'constructed' (following Luhmann) public sphere. The paper also analyses leisure and consumption, drawing theoretically on the 'domestication' approach, and how patterns of time use have become dominated by ICT use, communication networks become denser, and consumption more mediated. The paper concludes with some reflections on how these arguments integrate the social study of science and technology more closely within sociology as a whole.

END

11.11 Collaboration and Interdisciplinarity
Chair: Susan Rogers (McGill University)
        Papers by Susan Rogers, Pamela S. Lottero-Perdue, Sahra Gibbon, Theresa
        Garvin, Amanda VanSteelandt, Eveliina Saari, Barbara Bodenhorn, Davide
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Bioinformatic knowledge networks in genomic research: Producing objective results
through interoperable skills.

While interoperability is a term most often used to describe the compatibility of computer
operating systems, I employ it here in order to provide a framework for the way that
social systems interact and 'operate' with one another. As we embark on what is
currently being heralded as an unprecedented revolution in biology, there is both cause
and opportunity to investigate the growing field of bioinformatics along with the diversity
of knowledge networks thriving within genomic research. This paper explores the way in
which an imperfect scientific instrument called the DNA microarray produces
theoretically objective results through international networks of interoperable skills.
Although a microarray experiment is initially performed in a laboratory by biologists,
results are not produced without extensive bioinformatic contributions. Bioinformatics is
primarily a hybrid of biology, computer science, and statistics, an assemblage
constituting a new knowledge entity shaping current genomics research. Experts from the
three areas making up the core of bioinformatics retain distinct ontological devices which
guide further acquisition and distribution of knowledge and practices. The creation of
microarray data repositories, publication standards, experiment protocols and more are
largely due to the multi-skilled efforts of bioinformaticians who amass and synthesize
knowledge though a diversity of sites. Questions of concern include, "How are
bioinformatic skills accumulated and exchanged?" and "How is interoperability carried
out in order to produce a scientifically sound microarray experiment?"

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Perspectives on mentoring among institutional and individual actors in an
interdisciplinary research initiative

Mentoring is a popular mechanism for enculturating newcomers into many communities,
including academic science. Our review of the research literature and study of junior

faculty mentoring in an NIH-funded interdisciplinary, multi-institutional research initiative reveals widely variant conceptions of what mentoring is and should be. Using data from interviews with leaders, mentees, and mentors, as well as document analysis (e.g., NIH documents and calls for proposals), we trace understandings of mentoring at three levels of the research initiative: the national funding agency, local research organizations, and individual faculty mentors and mentees. At each level, the meanings of mentoring are shaped by diverse institutional, disciplinary, and personal factors. For example, while the NIH regards mentoring as a predominantly professional interaction, we found that the personal and professional lives of many mentor-mentee pairs are importantly entangled. We do not position the variability of the meanings and realizations of mentoring in the research initiative as being necessarily problematic or desirable. Rather, we position mentoring meanings and relationships as being locally emergent and inherently diverse—the transfer of meaning and outcomes of relationships being difficult to predict across contexts. This has implications for funding agencies, research managers, and researchers who look to mentoring as a strategy to support junior faculty and build research communities within and across science disciplines.

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Becoming (inter)disciplinary; experimental subjects in a genomic era – a documentary film project

Interdisciplinarity is becoming something of an ethical passage point across a broad range of institutional arenas and research cultures, yet the consequences of this agenda for shifts in working practices and disciplinary boundaries has only just begun to be explored. Charting the experience of 4 first year PhD students from different science and social science backgrounds this documentary film explores the process of becoming newly 'experimental' subjects as part of a unique inter-disciplinary PhD programme in genomic research at a university in London. Filmed over the course of a year it tracks the students traversing different disciplinary 'sites'- the foreign and familiar territory of the lab bench, seminar room, science and social science learning environments. It captures them in monologue and in dialogue with each other illustrating how terms of reference between and about 'science' and 'society' have been bones of contention and points of revelation on both sides, in turns both illuminating and frustrating for different persons. In reflexively examining the expectations and experiences of moving forward and back across the sciences and social sciences the film explores what it means to train individuals to speak across this disciplinary divide and what exactly might be at stake for the participants in this process. In doing so it provides a uniquely accessible entry point for discussion and debate on the kind of (inter) disciplinary subjectivity at stake in an emerging space of genomic science.

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The challenges of interdisciplinary research on environmental sustainability

Over the past two decades there is growing realization that some of our most challenging problems (Global Change, Sustainable Development, Environmental Management) are inherently interdisciplinary and cannot be successfully solved through divided groups of research projects examining isolated elements. Rather, the integration of several different approaches is more likely to provide long-term and viable solutions. The work reported here examines the perceptions and experiences of a group of scientific researchers involved in a multi-year, multi-disciplinary, international research project on environmental management (the Tropi-Dry Collaborative Research Network). In a set of semi-structured, key informant interviews, participants were asked about their expectations for the project, and their understandings of interdisciplinarity in the context of environmental sustainability. Here we present the preliminary findings from the start of the project. The intent is to follow these researchers over the 5 year span of the project to determine what changes they undergo in their perceptions and what specific challenges they experience throughout the project. This information is expected to identify the strengths and weaknesses of multidisciplinary work, and the challenges researchers face in interdisciplinary studies of environmental sustainability.

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Interdisciplinary Collaboration on the Ward of the 21st Century

The literature on expert ways of knowing often calls attention to the exclusivity of esoteric knowledge and language practices whose self-sufficiency and opacity allows experts to maintain their jurisdiction over a bounded set of problems. Yet the recent thrust of much academic research emphasizes interdisciplinarity or multidisciplinarity; demanding sharing and communication between these exclusive disciplines, and also, redirecting the kinds of questions now being asked about the nature of expertise. This paper examines one such interdisciplinary project, the Ward of the 21st Century (W21C) housed in the Foothills Hospital of Calgary, Canada. The W21C is a prototypical hospital ward and test-bed for new designs, technology, and medical practices. Several multidisciplinary committees and literature reviews on hospital design guide the development of the ward. A number of different disciplines are involved, including doctors, nurses, allied health workers, engineers, computer scientists, and sociologists, on a scale not seen before in a single health research study. Their efforts at collaboration and negotiations of the meanings of shared objects are documented by their anthropologist colleagues. This paper examines interdisciplinarity in practice and how these different experts view interdisciplinarity, each other, and their common project.

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Learning between research groups: What can be learned from the ethnographic studies of a Finnish and an American Aerosol Research Group?

Sociological studies on laboratory practices in the late 1970s and 1980s focused on how a scientific fact was constructed. These studies emphasized the local, interactive and emergent nature of the research process. What was less analyzed in these early laboratory studies was how scientific work was influenced by industrial or medical applications. Recent trend in organizing research work has been that its confines cannot be defined in single laboratories. Instead, research work is conducted in multi-voiced innovation networks and it is influenced by its customers such as industrial companies. Furthermore, research groups set up new goals to not only increase the current state of the art, but to commercialize the products of their research and development work.

My study enlarges the focus from the research activity as knowledge-production process to its organizational and managerial dimensions. I used the framework of cultural historical activity theory to study the change and development of a research group as a learning process. This developmental emphasis on the life of a research group creates new challenges for the ethnographic methods. The cultural historical activity theory provides ideas to elaborate new methods to study change in research work. This new method can be called the ethnography of change.

The paper is searching answers for the question of how the Finnish research group benefited from the ethnographic study that was conducted in their own community, and furthermore, what they learned from the study concerning their collaborator, the American research group and its spin-off firm. Do the ethnographic studies have potential to become "mirrors" for the scientists to see their own activity on a more conscious level, and to help managing the complex and tensioned development phases of their research group? The perspective of learning from the ethnographies is reflected upon by the leaders of the studied research groups. On a more general level

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Communities of knowledge: sciences and other expertises

The Barrow Arctic Science Consortium (BASC) is an initiative promoted by Utqiagvik Inupiaq Corporation and supported by the National Science Foundation which not only facilitates, but actively promotes the fruitful interaction between the many scientists conducting research in the Alaskan Arctic and local community members. What has been clear from several years of interactions with people engaged with BASC is that some

sorts of sciences (and scientists) share intelligible knowledge practices with other non-scientific experts but not all. The 'science/lay divide' continues to invite attention, although not as the dichotomy the term itself suggests. During the summer of 2006, we brought together a dozen young people from three different indigenous communities: Barrow, Alaska/Ixtlan de Juarez, Oaxaca/ and San Juan Nuevo Parangaricutiro, Michoacan. They were incorporated into a series of scientific research teams in Barrow – archaeology, whale biology, bio-complexity; they spoke with local elders about how they see changing environmental conditions; and they had several language sessions to think about ways in which environmental knowledge is expressed in Inupiaq. They subsequently spent the next month in the biodiverse regions of the Sierra Norte of Oaxaca and San Juan Nuevo.

From an anthropological perspective, what this sub-project provides was the opportunity to talk with different kinds of scientists (whale biologists, ice specialists, ornithologists, biochemists, climatologists, and ecologists studying the forest environments in Oaxaca and Michoacan, and so forth) as well as local experts, teachers, and students from three communities about what they think is important to know, how they come to know it, and what they think the implications of that knowing are – with a particular focus on climate change as a subject of inquiry. In particular, I explore how these varied participants see their relations to each other in what I am called temporary communities of knowledge. This then is not a study of interdisciplinarity, that notoriously challenging state. But it is an examination of the conjunction of different perspectives on a single issue. Rather than resting with what might be considered a straight Foucauldian account of the politics of knowing – an account which not surprisingly fits in many contexts - I am particularly interested in the fruitful conjunction of knowledge practices and in the sorts of interactions that have the capacity to generate unexpected outcomes.

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ORGANISING SCIENTIFIC WORK THROUGH OBJECTS. A CASE FROM THE FIELD OF BIOENGINEERING

In this paper I will discuss the different ways in which objects sustain the organising of scientific work and the collaboration between different disciplines. Based on the results of an ongoing ethnographical study of a complex bioengineering project for the development of a stem cell bio-reactor, I will argue that the collaboration between scientists emerged and is maintained around a partially shared, partially fragmented, and partially disputed object. I will contend in particular that the collaborative nature of the project and the somewhat peculiar way in which it is organised cannot be understood without referring to the emergent nature of the object of work and the ways in which it "bites back" at the human members.

In order to interrogate interdisciplinary work from an object-centred perspective I will adopt a socio technical sensitivity and employ in turn the notions of epistemic, boundary, and activity object – the latter derived from the Activity Theory tradition. I will show that

each of these three styles of theorising help shedding light on different aspects of the process through which human and non-human elements hang together and different knowledges are worked together. I will conclude by observing that these approaches provide a healthy counterbalance to the prevailing humanist narratives of team work, social networking and project chemistry which are increasingly used both by research managers and scientist for describing and accounting for interdisciplinary work in scientific labs and research institutions.
END

12.1 Medical Anthropology and the Life Stakes of Knowledge

Organizer/chair: Harris Solomon
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Elizabeth Roberts, University of Michigan, lfsrob at umich dot edu
Duana Fulwiley, Yale University, dfullwil at hsph.harvard dot edu

Ethnographies of science, technology, and medicine have compelled anthropological inquiry into what counts as evidence and expertise. This analytic perspective raises several key questions: What/who must be valued in order for knowledge to "count" as science, and what/who remains unaddressed? What forms of governance impel differences in the veracity and visibility of scientific knowledge, and how is such variability communicated and realized in the everyday? This panel invites papers that employ innovative methodological approaches to address such questions in the realm of biomedicine. We are interested in ethnographic accounts that expose the tenuous ground of

biomedical expertise and facticity, and the aspirations and anxieties of health and pathology bound to a sense of scientific certainty. In turn, the panel will address the contingencies of anthropological knowledge itself as "experts" deliberate on the ethics and modes of representation that shape "ways of knowing."

Vinh-Kim Nguyen
University if Montreal

Experimentality: humanitarian populations and shifts in biomedical epistemology. Examples from AIDS and other epidemics in Africa

Malaria, tuberculosis and HIV are the leading causes of morbidity and mortality in Africa. Over the past 5 years; these epidemic and endemic diseases have been framed as humanitarian emergencies, triggering the deployment of resources and interventions unprecedented since colonial times. Often in the absence of a functional state apparatus, these interventions resort to novel strategies to target, treat and follow populations. In so doing, they risk erecting parallel therapeutic states and rewriting the rules by which evidence for biomedical effectiveness is constituted. Drawing on ethnographic examples from West Africa, this paper explores the epistemological and political dimensions of this new régime of governmentality.

Harris Solomon
Brown University

Prime Destination: Science, Discourse, and Medical Tourism in India

Medical tourism to India (here defined as the act of foreigners traveling to India for healthcare) has, in a relatively short time, become the topic of numerous stories reproduced repeatedly in both Indian and international media. Such stories profile adventurous foreigners seeking out India's advanced medical technologies, "luxurious" hospitals, and highly skilled, empathetic care providers. In so doing, "Indian" medicine is glossed as distinctly modern, international, caring, and as a savior for uninsured or wait-listed foreigners with pressing medical needs. This paper will explore the ways in which corporate hospitals, public relations and media figures, internet medical tourism companies, doctors and foreign patients discursively animate this sort of science. I draw on fieldwork conducted in four Indian metropoles among actors with expressed stakes in the success of India's medical tourism "boom." By interweaving their narratives, I aim to explore modes of representation – such as the brand – that formulate a national "way of knowing" modern medicine. Additionally, I suggest how medical tourism's resounding popularity in India is marked as a "way of knowing" prominence and success internationally – a barometer of global visibility and of advantage over Euro-American healthcare systems deemed to be failures. In so doing, I discuss how discourses about science in contemporary India selectively highlight and hide the wealth and well-being of particular individuals and groups, for the purposes of advertising a nation's geopolitical "health."

Hannah Gilbert
McGill University

The practice of HIV knowledge production: Ethnographic persepctives on an African laboratory

The scaling up of HIV therapy throughout Africa has led to a new post-ARV reality that is beginning to focus on treatment support and the reinforcement of laboratory capacity. Within this context, African laboratories are emerging as central sites for the production of knowledge about HIV. This paper is an ethnographic examination of one of Senegal's locally-run laboratories that is widely recognized for its success in HIV research, and the application of its succesful research model to other diseases such as malaria and tuberculosis. This paper explores how scientific knoweldge is fashioned within the resolutely local space of the laboratory. It then places these processes of knoweldge production within the context of the laboratory's extensive network of local and international partners. How does locally fashioned knowledge about HIV and other infectious diseases translate on an international scale? This opens up a new space for inquiring whether globalization may serve not simply to colonize local forms of knowledge and practice, but whether it may also thicken local vernaculars. These questions are explored within the particular context of the politics of HIV research, which impels researchers to produce readily applicable best-practices that rely on the principles of commensurability and standardization.

Ian Whitmarsh
University of North Carolina, Chapel Hill

Translating Bajan Ethnicity, Wheeze, and Genes: Contradictions in an International Biomedical Study

As the FDA, NIH and the pharmaceutical industry attempt to incorporate biomedical research conducted in countries outside the US and Western Europe, new racial links are being made between divergent populations. Barbados is one such site. I here draw on ethnographic fieldwork tracking a US-based genetics of asthma project conducted in Barbados. I explore biomedical contradictions in the exchange of the study home visit, where the researchers translate Bajan meanings of ethnicity, wheezing, and family experiences into a science of asthma and race. For the participant Bajan families, 'ethnicity,' 'asthma,' and the genetics study have multiple and contradictory meanings. The researchers transform Bajan uses of ethnicity that alternately distinguish immigrants, people of the Caribbean, or black from Indian into people of African descent, making them equivalent to African Americans as having '25% Caucasian admixture.' Such biomedical research produces a kind of hyperdiagnostics of race: radical specificity of measurement of a highly variable object. I here analyze the ways biomedical (and at times anthropological) discourses preclude the possibility of overlap and contradiction, disallowing categories as multiple as the Bajan notion of ethnicity or asthma. This discourse erases the way scientific ideas, including race, are used contrastively and have mutually inconsistent associations. Given the prevalence of such objects—'asthma' in American medicine, 'race' in bioscience, 'science' in anthropology, 'globalization' in cultural criticism—some integrated acceptance of the contradictory character of our analytic tools might open new approaches to the global, familial, and scientific systems that we analyze and take part in.

Elizabeth F.S. Roberts
U of Michigan

The Enchanted Laboratory: Religious Rationalities and Modernity in Ecuadorian In-Vitro Fertilization

Catholicism is the only major world religion that unequivocally bans the use of in vitro fertilization (IVF). Nevertheless, in Ecuador, Catholic IVF practitioners declare God's dominion over their IVF laboratories in explaining pregnancy outcomes. My analysis of this routine combination of spiritual and material causal models in Ecuadorian IVF contributes to two ongoing discussions about (1) the tensions between "institutional" and popular forms of Catholic religiosity and knowledge and (2) the boundaries of scientific knowledge. The Catholic Church's historical and contemporary struggle to determine control of the miraculous has usually been characterized as a conflict between educated clergy and humble peasants. In the case of Ecuadorian IVF, we find, instead, educated elites and middle classes participating in this same contestation with the Church, proclaiming their direct ability to harness the power of God to effect material change on earth. However, while these Ecuadorian practitioners see themselves in a religious

struggle they do not see themselves as part of a struggle to determine control of what counts as science. Like other Ecuadorian elites and middle classes, IVF practitioners are heirs to Enlightenment thought, and experience themselves as modern in their participation in these high-tech endeavors. But their spiritual approach to laboratory rationality does not trouble this IVF practitioner's experience of themselves as moderns. Their spiritual power to affect clinical outcomes does not take place just anywhere, but in clinic and lab, disrupting epistemological presumptions about modern scientific "ways of knowing."

Duana Fullwiley
Harvard University

Qualifying the Pedigree of a Population 'Genetic' Effect

Many people affected by sickle cell in Senegal claim to "live well" by deploying a mix of good enough care strategies that range from the selection of pharmacopoeia, from tonics to antibiotics, to prayer and faith healing, to the outright denial of illness in some cases, and the induction of sympathetic illness symptoms in others. A concomitant "effect" of this range of practices is the "observation" of a less severe disease in a population, which, like any other, has come to possess allelic frequency distributions of DNA base pair changes that most of its members share, now known as the "Senegalese sickle cell haplotype." Yet, beyond the haplotype proper, a physiological difference that has been measured in some Senegalese sicklers' bodies is a persistently high level of fetal hemoglobin (HbF), which ranges from 10 to 30 percent of their total hemoglobin counts, thus reducing their sickle hemoglobin load. Fagara Xanthoxyloides, a medicinal plant that many sicklers in Dakar use, has recently been linked with an increased level of fetal hemoglobin in a leukemia cell line. This "association" is especially important as the discovery pattern of the major pharmaceuticals for sickle cell anemia in the US and the rich countries of the North were adopted for sickle cell due to their abilities to induce HbF production in leukemia patients. Through ethnography, this paper will explore these issues as they involve relations between actors in the global North and South. At stake are knowledge struggles to define what constitutes "better sickle cell health" in Dakar.

Discussants:
Rayna Rapp NYU

Margaret Lock McGill

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12.2 Examining the Structures of Participation in New Media and Information Technologies

Organizer/chair: Tarleton Gillespie
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Of particular sociological and political importance today is the question of who participates in media culture and public discourse, in what way, for whom, and with what consequence – in other words, what structures participation in digital culture. Those dynamics are currently in flux, largely because of the emergence of new media and information technologies, and their gradual incorporation into everyday practice. If we are going to investigate the emerging "structures of participation" in digital culture we must go beyond the economics, politics, and technologies that shape participation. We must also consider the mechanisms by which those technologies are articulated and legitimated. The way these forces are articulated, the way they implicitly characterize media, information, and technology, the way they are framed and legitimated, shape cultural participation as much as the design of the technologies themselves. This panel will consider the way economic, political, and technological regulations come fitted with ideas, terms, metaphors, paradigms: "public interest," "user," "social movement," "Internet," "piracy," "neutral," "open. These ideas shape how we understand cultural and political participation, what seems normal or possible or legal or right or worthwhile. We will pinpoint some of these paradigmatic principles; examine spaces and practices in which they are discussed, reworked, and stabilized; and inquire as to their implications.

Fred Turner
Dept. of Communication, Stanford University

Burning Man at Google: How Art Worlds Help Sustain New Media Industries

Every August for the last twenty years, information technologists and other knowledge workers have trekked out into a barren stretch of alkali desert and built a temporary city devoted to art, technology and communal living: Burning Man. Drawing on extensive archival research and interviews, this presentation explores the ways that Burning Man's bohemian ethos supports new forms of production emerging in Silicon Valley and especially at Google. It will show how elements of the Burning Man world – including the building of a socio-technical commons, participation in project-based artistic labor, and the fusion of social and professional interaction – have helped shape and legitimate the collaborative manufacturing processes driving the development of Google and other firms. The paper will thus develop the notion that Burning Man serves as a key cultural infrastructure for the Bay Area's new media industries.

Gina Neff

Dept. of Communication, University of Washington

At Your Own Risk: Venture Labor and Participation in Innovation

How does the ability to bear risk determine who can participate in digital innovations? In this paper I draw on ten years of deep ethnographic research among the first-wave of commercial internet pioneers in New York City to examine the origins and rise of employees' entrepreneurial behavior, the dynamics of risk during the dot-com boom and bust, and employees' strategies for managing this risk. The need to accept and bear more entrepreneurial risk in one's job is a relatively new phenomenon in modern capitalism and requires what I call "venture labor", which entails employees' investment of financial, human, and social capital into the companies where they work. Venture labor stems from the lack of job security and the increase in employment flexibility in post-industrial work and is particularly pervasive in innovative industries. The de facto requirements for venture labor in innovative industries determine who is allowed to participate in shaping digital media, influence the direction of those technologies, and challenge our existing theories of the firm.

Adrienne Massanari
Dept. of Communication, University of Washington

Blurring the lines between "users" and "designers": Co-productive interactivity online

Cultural production on the Web is a dynamic, evolving process, but the framing of interactions between those who produce ("designers") and those who consume ("users") has remained relatively static. Structures of participation on sites like Flickr, YouTube, del.ici.ous demonstrate these roles are interpenetrated; similar structures are beginning to be employed in more staid realms of the Web as well, e.g. on campaign sites. Users and designers are engaged in a co-productive activity, requiring new conceptualizations of interactivity. Drawing upon work in activity theory and actor-network theory, we suggest that exploring the permeable and fluid nature of the boundaries between designers and users illuminates the nature of participation online. As technology becomes more mobile and intertwines with our built environments, the ways in which "users" shape digital and analog environments will be seen as another stage in the design process, rather than as something to be "fixed" or repaired by "designers." (co-authored with Kirsten Foot)

Tarleton Gillespie
Dept. of Communication, Cornell University

Learning to Consume Culture: Presumptions about media, technology, and participation in industry-sponsored anti-piracy campaigns

To curb unauthorized downloading, the major film, music, and software corporations have developed public education campaigns aimed at children, extolling the virtues of copyright and the immorality of piracy. Some are curricular materials to be incorporated

into K-12 classrooms. Through an examination of the materials themselves and through interviews with their designers, this essay examines not only their characterization of copyright law, but their implicit claims about how, why, an by whom culture is produced, circulated, and consumed. These campaigns traffic in and perpetuate familiar notions of what copyright is for, how technology is meant to be used, and why culture is important, helping to structure the dynamics of cultural participation. Amid these assumptions, comfortable roles are offered to young users of new media -- particular that of "consumer" rather than "user" or "citizen" -- roles that are far from neutral in the current debates about cultural policy and information technologies.

Leslie Regan Shade
Dept. of Communication Studies, Concordia University

Policymaking in the Wind?

This presentation will consider structures of citizen participation in policymaking, with a particular examination of the Alternative Telecommunications Policy Forum. This forum, consisting of policy experts, academics, and representatives from over a dozen community and public interest organizations from across Canada, met to discuss the public interest implications of telecommunications policy reforms currently being considered by the Canadian government from the final report of the Telecommunications Policy Review Panel (TPRP). This talk will provide: a brief overview of the TPRP recommendations; an analysis of community and public interest group participation in the process; and the Forum's recommendations to the Government of Canada on a public-interest centric Telecommunications Policy. What impact these "bottom up" policy recommendations can have on actually influencing and changing policy in an era of fiscal and cultural neo-liberalism is less certain. But the effort to involve citizens represents an ongoing shift in the roles of policymaking.

Christopher Kelty
Dept. of Anthropology, Rice University

Imagining Neutrality: Recursive publics, free software and electronic voting machines

The success of free and open source software has allowed a very diverse array of social actors to re-imagine the relationship between public participation and the creation of digital objects--whether software, text, video, audio or image. On the one hand, these practices--both technical and legal-- can be adapted to new domains and new objects; on the other they embed certain ideas of neutrality that belie the political agonism in which they participate. Electronic Voting Machines are perhaps the most profound example of this tension-- exemplifying the need for both scientific neutrality (a fair election system) and the inevitability of political interest. This paper presents recent ethnographic work amongst scientists who examine the security and efficacy of EVMs, and raises questions about the application of practices from the world of Free Software to debates about the design, manufacture and certification of voting machines.

Thomas Streeter
Dept. of Sociology, University of Vermont

A Story of One's Own: the Dean Campaign and the Internet as a Social Narrative Technology

The Dean campaign overturned several deeply held assumptions about what was possible in American politics, and for the first time in twenty years made neo-liberalism seriously contestable in the US. This could not have happened without the internet; however, subsequent reproductions of Dean's online efforts have had little such effect. Drawing on discussions with a number of Dean's internet activists and other data, this essay explores this context -- the structure of feeling of the time -- that made the internet so effective. Distinguishing between "technical layer" technologies (like packet switched networks), distribution systems (like a critical mass of internet connected citizens), and "social technologies" (like Meetups or moveon.org-styled emails), the essay shows how this ensemble of potentialities coupled to a uniquely sharp disconnect between US leadership and a substantial part of the electorate, enabled large numbers citizens to "write" themselves into a story of hopeful insurgency and activism.

Leah Lievrouw
Dept. of Information Studies, University of California, Los Angeles

Theorizing Alternative/Oppositional New Media: Exploring New Social Movement Theory and the Sociology of Alain Touraine

New media technologies, with their more decentralized, distributed, point-to-point architectures, have become an indispensable platform for artists, activists, and citizens to challenge mainstream culture, politics, and society, and to gain visibility for their interests. In previous work I have described several genres of oppositional, alternative, and activist new media projects. Here I present a preliminary analysis of these genres in the context of new social movement theory, particularly the work of French sociologist Alain Touraine. Touraine contends that the fundamental conflicts of post-industrial, or "programmed," society are knowledge-based and cultural. Actors mobilize their interests through autonomous creative expression and interpersonal interaction. His work helps reveal how media and information technologies constitute resources for political participation and resistance. New media shape participation in oppositional social projects; at the same time, they are themselves reconfigured by users' participation.
In my opinion, pushing eight papers into one 2-hour session would be too much. Ideally, this would be a two-panel sequence. I'd love to think about the best model for this, if a decision is being made on how to best fit it into the conference schedule. Thanks.

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12.3 Rhetorical Views of Knowledge-Making in Health and Medicine

Organizer/chair: Philippa Spoel
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Rhetorical theory offers a rich framework for exploring questions of knowledge-making and knowledge-sharing in health/medical contexts. Drawing on the rhetorical understanding that how we communicate about the world constitutes what we know about the world, our presentations explore how specific forms of health/medical communication create and validate knowledge in health and medicine. Speaker 1 traces the processes of inferential meaning-making in scientific reports on transgenic animal models of human psychiatric disorders, while Speaker 2 interrogates how clinical medicine negotiates the problem of conflicting principles of healthcare when it tries to apply a biomedical framework to research about complementary and alternative medicine. Speaker 3 discusses the mingling of expert and lay knowledges in her research on the ways of knowing/communicating that are practised and valued in visits between midwives and expectant mothers. Speaker 4 argues that a new health subject is constituted by new information technologies; she draws on the ancient rhetorical theory of Quintilian to posit that emotional appeals are an endogenous feature of the technologies themselves. Speaker 5 charts the shifting tropes and values in literature about HIV addressed to children as these texts respond to, and reproduce, culturally normative discourses of the disease. Lastly, speaker 6 reflects on the meanings and values that the term/concept "communication" itself holds within medical enquiry. Our papers together form an invitation to consider not only how rhetorical theory can help us understand socially-situated instances of health/medical communication, but also how rhetoric is itself a strategy for knowledge-making in health and medicine.

Monika Cwiartka
University of British Columbia

The Rhetoric of Transgenic Animal Models of Human Psychiatric Disorders

In 1980 Jean-Pierre Hernalsteens successfully introduced foreign DNA into plant cells. Transgenic mice were immediately to follow. The first transgenic mouse paper, by Jon W. Gordon and Frank H. Ruddle, was published in the Proceedings of the National Academy of Science on December 1, 1980. The advent of transgenic murine biotechnology made it possible to selectively alter or delete genes that code for molecules and receptors, like serotonin, that affect mood and behaviour. In this paper, I will explore some of the discursive means of traversing the inferential distance between practice and meaning in scientific reports dealing with transgenic animal models of complex human psychiatric disorders, such as anxiety and depression. In some contrast to in vitro molecular experimentation, the very idea of modeling implies inferential leaps between what is done and what it means; between the recombination of specific, targeted genes,

and the functioning of a complex organism; between results obtained in one species, and the possible implications for another; between physiological readouts, and more complex states of health and disease. Transgenic models of psychiatric conditions in particular require a large leap to go from individual genes to something as elusive and changeable as mood – especially when experienced by a different species through a complete communicative abyss. Borrowing from rhetorical criticism of science, laboratory studies, and cultural criticism of medicine, I will explore how researchers negotiate the rhetorical shift from genes to mood, from animals to humans, and from data to meaning in the context of the scientific paper.

Colleen Derkatch
University of British Columbia

Defining "Efficacy" in Clinical Research

The question of efficacy in health care research and practice depends largely on ways of knowing—of knowing what works (and for whom it works), what is safe, and which health practices (and practitioners) are trustworthy. This paper will examine intersecting, and often conflicting, ways of knowing in clinical medicine through the example of research on complementary and alternative medicine (CAM). With the dramatic rise of use of CAM has come a correspondingly high level of research on those practices but designing large-scale clinical studies has proven difficult because the "gold standard" of biomedical research—the randomized, double-blind, placebo-controlled trial, or RCT—does not translate well to practices such as acupuncture or chiropractic.

Complicating this problem of design is the problem of defining efficacy: because most CAM practices operate according to principles largely incompatible with biomedical theories, researchers must identify endpoints that are appropriate for the practices under study but still consonant with basic biomedical principles. Compounding this problem is the fact that the majority of patients seeking CAM do so for ambiguous or chronic conditions that depend primarily on subjective assessments such as pain scales, leaving evaluation of the therapies rather open-ended. This paper will survey these problems from a rhetorical perspective, assessing the kinds of arguments researchers make in determining the markers of efficacy, and tracing some of the ways in which researchers use a variable principle of efficacy to reconcile their own disciplinary allegiances with the practices under study.

Philippa Spoel
Laurentian University

Rhetorics of Knowing in Midwifery Healthcare

Working from the assumption that rhetorical processes are inherently epistemic, I will explore the intersections of rhetoric (strategies of communication) and epistemology (ways of knowing) in the context of healthcare consultations between midwives and expectant mothers. This analysis is based on a pilot study of consultations between

Canadian midwives and their "clients." In this rhetorical situation, midwives are—by dint of their education and professional experience—positioned as "expert" knowers while the expectant mother possesses "lay" knowledge, suggesting a standard hierarchy between the healthcare professional's medico-scientific knowledge and the healthcare recipient's (merely) personal, experiential knowledge. However, Canadian midwives also resist this hierarchy by endorsing a non-authoritarian, co-operative approach to healthcare that facilitates the mutual exchange of diverse forms of knowledge, including not only "objective" scientific knowledge but also emotional, experiential, and narrative ways of knowing.

Given this situation, how does the communication and construction of healthcare knowledge occur in midwife-woman encounters? What kinds of knowledges, in what ways, are communicated by both participants? What forms of local and lay knowledge do the women communicate and how do midwives respond? What kinds of new knowledges do they co-create? In what ways does the midwifery approach to healthcare communication replicate, resist, or reconfigure dominant rhetorics of medico-scientific expertise? Does the rhetorical process of the midwife-expectant mother consultation suggest new possibilities for the kinds of knowledges and rhetorics that might shape healthcare, or does it primarily perpetuate standardized, hierarchical modes of expert-lay science communication?

Judy Segal
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Making Health Knowledge with New Information Technologies: A Rhetorical View

New technologies are in the news everyday: camera phones become suspect as surveillance devices; children are victims of internet seducers. The stories are often alarming, but agree to travel the road of new technologies, regardless of the dangers ahead. Meanwhile, critical commentary is easy to avoid, turning the problem on itself: filter technologies make it easy for people to know only what they wish to know.

Yet, as McLuhan advised, we ignore technology itself at our peril. This paper picks up one end of one string, and examines what new information technologies bring to the making of health knowledge in the public sphere. Through new technologies, we are advised on what wellness is, what diseases are available to be had, how to guard against stealth illness, and, when we fail, how to be ill. A new health subject is made in and by new technologies.

As one means of examining health knowledge and health subjects, my paper draws on the work of Roman rhetorical theorist, Quintilian (35-95 CE). Quintilian describes the rhetorical means by which audiences are brought through emotion to abandon reason—to have pathos surpass logos for judgment.. The strategy Quintilian describes applies almost inevitably when health is the topic of new information technologies: in part because of its mode of circulation, health information now has breadth and force; like panic itself, it is indiscriminate and impossibly personal at the same time. Quintilian's

theory is one means of examining, for health, the ways that how we know is what we know.

Deborah Dysart-Gale
Concordia University

Suitable for Children: A Kairology of HIV Rhetoric in Children's Literature

Although frequently unacknowledged in histories of the HIV epidemic, children were the earliest victims of the disease. In the acrimonious debates between medicine, government and advocacy groups concerning etiology, treatment ("what to know") and their political implications ("how to know"), infected and bereaved children's "need to know" was largely ignored.
By the late 1980s, this need was addressed by the appearance of HIV-themed literature for young adults and children. These books triangulated advances in treatment, changes in epidemiology, and cultural expectations for developmentally appropriate material for children. Designed for a mass (albeit clearly defined) audience, the texts charted culturally (and commercially) respectable waters, utilizing a familiar repertoire of tropes and values to define both the problems and the solutions for children threatened by the disease. For example, the earliest children's books focused on the loss of significant adult figures -- typically white, middleclass "uncles" with caring support networks. Such books presented the child protagonist as surmounting the problems of bereavement, drawing on tropes of family continuity and the possibility of maintaining memories of lost loved ones. Later, with the introduction of protease inhibitors, the books introduced infected children themselves, and the tropes shifted to discourses of fairness, friendship and the role of medical authority in preserving civil rights and order.

This kairology of HIV is significant in that it not only traces the development of the rhetorical response to the epidemic at its most didactic level, but also reveals the influences that shaped attitudes of adults today.

Joan Leach
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Valuing Communication in Medical Enquiry

The "values turn" in epistemology has been fruitful for linking implicit values with epistemic goals and methodology in scientific inquiry. Communication has been identified as a value, a method of explicating values, and an outcome of enquiry. This paper surveys and synthesizes the emergent literature on the value of communication and presents a framework for thinking about communication as a value in inquiry, using medical inquiry as the key case. The paper works through a series of examples to show what the various meanings of communication entail, what the range of values operating are, and some of the consequences when communication is figured in these ways.
The examples I discuss include appearances of 'communication' in clinical practice guidelines, in a series of presentations (hosted by the AMA, NHS and the NHMRC

Australia) for postdoctoral researchers in medical research, and in a series of interviews with researchers about the role of communication in research. The variety of understandings of communication among these documents, institutions, and people show the range of communication values at work as well as the way in which communication is valued in inquiry.

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Postmodernism and the Laboratory

The tensions in the current debates between the humanities and the sciences on questions of knowledge, truth and epistemology are eminently palpable. Postmodernism has entered into a contentious discussion with scientific realism, so to anthropomorphically speak. Postmodernism and science and technology studies share the common goal of putting an end to realist epistemology and accompanying correspondence theories of truth, and counter scientific realism in its basic proposition that science, and only science, is capable of producing accurate representations of reality (Ward 1996: xv, 13). The scientist's contrapuntal to postmodern skepticism and relativism reach back into the seventeenth-century when William Gilbert criticized literary and philosophical humanists "who were only acquainted with books" rather than being "practical in the research of the objects of nature."

For the 2007 4S Conference with the theme of "Ways of Knowing," I wish to interrogate the methods of inquiry among the "two cultures" of science and literature. I am in a unique position to do so in that I am a literary scholar by formal education who is currently conducting research in a molecular biological laboratory. The question that I wish to formulate concerns how scientific knowledge is represented from the viewpoint of a postmodernist in the laboratory. I, as much as anyone, am well aware of the contradictions and paradoxes inherent in such an endeavor. Postmodernism, a major cultural theme in literary studies, maintains that signs have no direct relation with referents and that we have no direct access to the real. However, to enter the scientific laboratory is to enter into an arena in which the direct access to the real is the most central assumption. The resolution to these seemingly antithetical trajectories concerns a major trajectory of my paper for this conference. Drawn from my experiences in the laboratory, I hope to shed light on the conundrum of the "two cultures" and to show (abstract over word limit).

END

12.4 The Changing Organization of Science and Its University Context

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The organization of science and its university context have been changing significantly over the last few decades. The commercialization of research and university-industry relations are assumed to be some of the most powerful causes of this change. But questions of what specific changes in organization have occurred, and how and why they occurred, have not been systematically explored. This session brings together empirical work that examines change in specific cases and contexts, and its relationship to external influences. The papers examine in detail such issues as the long-term effects of funding on the organization of laboratories; the emergence of a new organizational form, the university-industry research center, within universities; how scientists define the public good given the shifting role of university research; and why universities stopped building their own administrative computing systems and started buying standardized ones. These papers address questions of broad interest: How has the organization of science and universities been changing, and why? What are the local processes and mechanisms through which outside influences lead to change? How has the availability of new resources outside the university influenced change, and how are they involved in current organization?

Elizabeth Popp Berman
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Creating a New Organizational Form: The Causes and Effects of the Emergence of the University-Industry Research Center in the U.S.

The university-industry research center (UIRC) is a freestanding administrative unit within a university that brings together faculty, students, and industry representatives to work on problems of common interest, usually with some degree of industry funding. UIRCs did not exist prior to the 1970s, yet by 1990 almost 70% of industry funding of university research was being channeled through them. Despite their ubiquity, however, little attention has been paid to UIRCs as an organizational form in the literature on university-industry relations. This paper shows how UIRCs emerged and spread during the 1970s and 80s, from failed efforts to create such organizations by ARPA in the 1960s, to experiments with the form by NSF in the 1970s, through its dissemination at the state level by groups like the National Governors Association in the 1980s. Government initiatives were the primary driver of UIRCs, and while initial efforts were geared toward improving the utilization of government-funded technology, the programs were quickly

tied to a rhetoric of economic competitiveness as well. Although UIRCs were difficult to establish because of the interdisciplinary nature of their work and cultural differences between universities and industry, their success at leveraging relatively small amounts of government funding with larger contributions by industry and their political appeal in a climate of concern with technological competitiveness helped the form to take root and spread. The result has been an organizational change within the university that both to increase industry contributions to research and pushes research in directions that are more commercially relevant.

Nicholas Rowland
Indiana University

Rise of ERP: Actor-Network Theory vs. New Institutional Theory

This paper details a recent shift in organizations of higher education concerning information technology. Before the 1990s, it was commonplace for colleges and university to custom-build their own, unique campus computing systems. As such, administrative computing systems were as diverse as the schools running them. Now, however, colleges and universities are much more likely to have purchased a more standardized system from a private market vendor - vendors like PeopleSoft and SCT Banner sell universities these new systems called ERPs, or Enterprise Resource Planning systems. As one systems administrator neatly summarized the complex technological shift in higher education, "first we built; now we buy." The differences between "building" and "buying" are substantial, and this paper is dedicated to understanding the precursors and drivers of this shift in organizational practices through the complementary lenses of actor-network theory and new institutional theory.

Annalisa Salonius
McGill University

Working in the Lab: The Incorporation of Graduate Students and Postdocs into the Production of Research in the Biomedical Sciences under Competitive Grant Support and its Effects on Training

Despite the dependence of most academic scientists in Canada and the US on external funding, its effects on the social organization of research and training have not been systematically studied. Nor has the relationship between the organization of research and training, although most academic labs are composed primarily of graduate students and postdocs. This paper examines the relationship between the organization of research and post-graduate training in the biomedical sciences in two leading research universities in Canada under a system of competitive grant support. Evidence gathered in more than seventy in-depth work history interviews during an ethnographic study in biomedical labs in these universities shows how a particular pattern of involvement of students and postdocs in research occurs, where the scientific productivity of faculty members

becomes dependent on trainees. Through the practices of investigators and the experiences of graduate students and postdocs, the analysis shows how trainees are incorporated into the production of research and suggests how these practices are related to external influences, primarily those associated with competitive grants and publication. Findings show that while the project is still central to the organization of training, a division of labour occurs where the faculty member typically assigns projects to trainees, pays them annual stipends, and extends scientific credit to them in work published. In turn, scientific credit has informally been fully integrated into the structure of training. The findings also show how the organization of research under competitive grants has affected the organization of training.

Rick Welsh, Leland Glenna, William Lacy, and Dina Biscotti
Clarkson University, Pennsylvania State University, UC Davis, and UC Davis

U.S. Agricultural Scientists' Definitions of the Public Good

Non-profit organizations, like universities, are given a specific legal status within capitalist society. In large part the assumption is that non-profit organizations are in the business of delivering goods and services that benefit society at-large—i.e., serving the public good. This does not mean that employees of universities are on whole more altruistic and less self-interested than others. Rather it means that the non-profit organization is assumed to have a different set of roles, responsibilities and goals in capitalist society than for-profit firms. Land grant universities traditionally have been charged with addressing public good issues and problems in the fields of agriculture and rural development. In the past this has meant the development of publicly available crop varieties with liberal licensing arrangements. However, shifts in the public policy and economic environments have resulted in an upsurge in patenting and more exclusive licensing arrangements on the part of land grant universities and their scientists. Within this more proprietary context, and using recently collected interview data, we explore how agricultural scientists define the public good in regards to the shifting role of the land grant university, the scientists' research agendas and the rise in importance and prominence of emerging agricultural biotechnologies such as transgenic crops.

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The Role of Researchers and Technology Officers in the Commercialization of Plant Biotech Research by American Universities

This paper deals with the expansion of academic activities relating to knowledge commercialization. The "organizational model" suggests that public policies have fostered interactions with industry and provided additional resources to sustain diffusion. The "external model" put emphasis on new opportunities for the commercialisation of university research, mainly due to the emergence of information technologies and

biotechnology. Activities of leading American universities in plant biotechnology are studied. Through a technometrics database dealing with patents and publications in the area, fifteen universities representing the largest share of research were retained and leading researchers were identified. Seventeen researchers or technology managers were interviewed. The objective was to determine the extent to which commercialization is an important concern for researchers and universities, and if so what are their strategies. In the case of researchers, questions were related to their research activities; potential users of their research results (firms, associations); activities related to industry (patenting, contracts...); and incentives and obstacles to commercialization of research, teaching, publications, university regulations, state regulations… Technology officers were asked to discuss : evolution of the office; commercialization strategy of the university; in house regulation of intellectual property (relations with researchers); regulation of intellectual property (relations with users; enforcement of patents); government regulation of intellectual property (state policies; role of the university as a Land-Grant Institution). Researchers and their technology managers can be put in a continuum of those who defined themselves as entrepreneurs, looking for benefits for their organization and their region, and those who considered commercialization as a new duty for researchers and their university in order to raise research funds.

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The Entrepreneurial University in Japan:

Japan instituted a series of policy reforms in response to a perception that Japanese universities were underperforming relative to their American counterparts, and that systemic reforms were needed to close the gap, including establishing TLOs, providing subsidies for university patenting and university-based start-ups, relaxing the restrictions on professor's consulting and participating in commercial activity and, finally, in 2004, setting up the universities as independent public corporations.

These reforms raise several important science and technology policy issues. First, what were the effects of the reforms on the university's position in the national innovation system? And, are these changes having adverse effects due to conflicts in the dual missions of advancing science and contributing to commercial development of technology? Also, how responsive are Japanese universities to policy interventions, a key question to those interested in science and technology policy, particularly as a means to promote economic growth. Finally, how have these reforms affected the stratification system in science, at the individual and institutional levels?

To answer these questions we conducted a national survey of engineering and biomedical faculty in Japan. We use this data to analyze the impacts of the reforms, and to test the research questions above. We find that university faculty have become more commercially active, but that the prior system of informal gift-exchange between professors and firms continues to dominate technology transfer. We also find some evidence of shifting research agendas and increases in publication delays, suggesting that there may be some adverse effects from the reforms.

 END

12.5 Climate Modeling and Uncertainty: Epistemology and the Construction of Climate Facts

Organizer: Erich Schienke
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Chair (part1): Candis Callison
Chair (part 2): Nancy Tuana

Since the first global computational models were developed in the late 1960s, climate change science and long-term projections concerning global warming have been based almost entirely on the output of computationally intensive models of various earth systems. Global climate models, or general circulation models (GCMs), are based mainly on atmospheric and oceanic models, with the further inclusion of other system models such as the carbon cycle or polar ice. Computational complexities, extensive data gaps, differences in modeling strategies, and differences in data interpretation are all compounded to produce a wide range of uncertainty amongst models about the future of global climate change. Indeed, it is these uncertainties that have been magnified and used divisively in the U.S. and Canadian Government's decisions to not take proactive measures in GHG reductions. However, as the majority of climate scientists have been claiming for the past decade and as the IPCC AR4 demonstrates more clearly than ever, the current certainties about climate change far outweigh the uncertainties.

The second set of papers in the first panel are about ethical imperatives of measures and means. Accepting significant climate change as fact brings with it a variety of ethico-political imperatives to do something about the future it predicts. What these facts imply, however, about "our common future" is quite uncommon to our past. Globally, those nations and communities most responsible for inducing climate change are not the same as those most vulnerable to the adverse impacts it is already bringing. An equitably distributed approach among responsible nations and communities will likely be necessary to initiate globally acceptable and appropriate solutions to climate mitigation and local adaptation policies. Like so many examples in technocratic policy-making processes, climate change policy options are often framed and articulated as scientific and economic constructs, usually excluding or negating important ethical considerations. Considerations that require further ethical grounding include, most notably, the distribution of harms and benefits, setting of atmospheric targets, allocation of emissions, the cost to nations and communities, the potential of new technologies, and procedural fairness. This panel presents a variety of analyses as to where climate change policies need to rethink their ethico-political foundations, from broadening the inclusion of stakeholders to independently recognizing the responsibility to take action. In addition, this panel addresses the need to recognize the socio-cultural contexts of certain ethical choices being made in the face of adaptations.

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Trust in Data: Climate Change Knowledge and the Meteorological Information Infrastructure

Since the mid-1980s, climate scientists have sought to combine many kinds of historical weather and climate data through a technique known as "reanalysis." Reanalysis uses many data sets as input to a single "frozen" weather model; the output is a new long-term data set (usually 40-50 years) that is global, internally consistent, and potentially of higher quality than the original measurements. High early hopes for using reanalyzed data as a benchmark in studies of climate change were muted in the early 2000s, when skepticism arose about the quality of these data for variables strongly affected by simulation model parameterizations. This paper explores issues of trust in climate data: which data sets are trusted (and trustworthy), why, and for whom. It connects these issues with the nature of the meteorological information infrastructure, the oldest and best-developed global digital information system.

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Spinning climate change: how emerging social groups invest climate science with meaning

The environmental movement has been arguing for the scientific fact of climate change for several decades and assuming the stability of its meaning, but the emergence of nascent social movements point to a recursive and/or evolutionary process of establishing meaning along the lines of what Bruno Latour refers to as turning ``matters of fact'' into ``matters of concern'' and vice-versa, or Alberto Melucci calls ``experimental labs'' for new relations between environmental formulations, media strategies, and scientific claims. Drawing on multi-sited ethnographic research, this paper offers conclusions regarding the ways in which indigenous, religious, scientific, and industry-targeted social/activist groups have been using media and public relations to ``reframe'' climate change by putting a human, legal, moral, financial, or scientific face on this issue that has, until very recently, languished at the bottom of environmental concerns despite mainstream media coverage since the 1980s. These social groups, operating outside formal government or policy frameworks and the mainstream environmental movement are attempting to shape perceptions and actions regarding climate change by assuming it as scientific fact – rather than debating it, and investing the issue/problem with meaning, ideological stance, and a roadmap for potential solutions.

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Has climate changed ecology? A bibliometric analysis of the changing focus of ecology research

There is no one correct set of research questions that ecologists should pursue to most effectively explore the world. Scientists choose their research questions in response to a variety of influences, including (but not limited to): social and political concern, funding opportunities, individual intellectual interests, perceived scientific merit, and career advancement opportunity. These influences change over time, leading to gradual shifts in research priorities. Ecologists can modify and/or reify the way problems are framed in the decision making arena through the construction of scientific knowledge about problems and possible policy intervention points. The scientific enterprise can profoundly influence the policy and management arenas through the research portfolios that it addresses. Over the past thirty years climate related research has expanded to become a significant portion of our national research portfolio. If ecologists (and/or funding agencies) choose to focus on feedbacks between ecosystems and climate to the exclusion of other aspects of ecology, climate-related knowledge might come at the expense of understanding of other potentially important drivers of change. I perform a bibliometric analysis of articles published in 112 ecology journals since 1970 to investigate the changing focus of ecology research over that time period. Both the subjects and methods of ecology research have changed; climate change has become a dominant theme and modeling and simulation have ascended to become central methods. The natural history and taxonomy components of ecology have diminished in popularity over that same period.

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General Circulation Models and Philosophical Robustness

Philosophers have discussed `robustness' as an epistemic strategy for understanding complex systems. Richard Levins developed the idea in 1966 with respect to modern population biology; he explored how independent approaches from several sub-disciplines were combined in order to establish the validity of the overall field. Levins says the resulting ``truth is the intersection of independent lies.'' William Wimsatt has extended the robustness concept as a criterion for what is real and his criterion has been used in philosophical analyses of theoretical models. Some have tried to claim that the diversity of causal assumptions in General Circulation Models (GCMs) is a strength. Given the political and scientific challenges surrounding GCMs, this paper aims to explore the possible relevance of a robustness analysis. To what extent do models of general circulation use a robust set of approaches to understand climate? Current research on this question is analyzing the independence of system functions, representation, and parameterization in climate models. A sound robustness framework can help overcome

uncertainty in analyzing theoretical models, and perhaps suggest fruitful avenues for further research on GCMs and how to handle their political implications.

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Frameworks for Justice in Global Climate Change Policy

Many of the policy tools often employed to solve environmental problems such as cost-benefit analysis usually do not adequately deal with these issues because they often ignore questions of just distribution and other forms of justice, as again appears to be the case with policy issues concerning climate change. This paper proposes and evaluates frameworks for generational, distributive, and procedural justice in the formation of global climate change policy. Generational justice would include the duties and rights to protect the interest of future generations of humans, plants, animals, and ecosystems. Distributive justice is concerned with the fact that most of the emissions come from countries that will be least affected by climate change, whereas the countries most effected historically have contributed least to GHG emissions. Procedural justice looks at the means and ends to assure fair representation in decision making concerning climate policy.

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The Ethics of Uncertainty in Climate Change

Uncertainty and unintended consequences run rampant throughout climate change. Our changing climate itself is largely a product of unanticipated and unintended consequences of industrialization. Scientists are uncertain about the relative contributions of different causes and the likely magnitude and speed of effects and just where they are likely to occur. New technologies suggest possible solutions, but much is unknown about their likely effectiveness and possible unintended impacts. Economists are unsure about the economic consequences of climate change or of proposed policy solutions. Distributive impacts are unclear, both within and between countries. Policy makers have difficulty assessing the need for action and the merits of different policy options. Judges and lawyers are faced with decisions about assigning and allocating responsibility. This paper will focus on the ethical implications of decision-making under uncertainty. Philosophy provides theories about rights and duties and how responsibility for consequences may depend on contextual factors such as degrees of understanding. Law has devised procedures to manage uncertainty including burdens of proof and rules of evidence. Different decision rules have been applied to policy decisions involving uncertainty. Many theories deal with the management of uncertainty in setting and

implementing policy. Insights from these fields will be used to analyze the ethical dimensions of making decisions under conditions involving uncertainty, such as those presented within the context of climate change. Issues to be addressed include how uncertainty affects the allocation of responsibility, the need to balance uncertainties of different types of risks, and how uncertainties can lead to bad decisions and unintended consequences.

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Ethical Dimensions of Renewable Energy Choices in the Case of China

As a global population we are collectively facing the largest double bind ever, i.e., it seems we must collectively innovate in the development and choice of our energy systems, and quickly, to therefore reduce the impacts of climate related damages already done through generations of fossil fuel energy use. In part to redress the fact that more fossil fuels will be consumed before stabilization of GHG output is achieved, and to address deficits in their own national energy reserves, China's Renewable Energy Law went into effect in January 2006. As a result, China is currently investing the most of any country in the world towards renewable energy research ($6 billion U.S.), and is on track to having fifteen to twenty percent of its energy production come from renewable resources by 2020, up from seven percent in 2005. Using a framework beginning to emerge from the Ethical Dimensions of Climate Change program, this paper evaluates the ethical dimensions of choices being made about China's renewable energy, particularly in how these choices affect the content and direction of technoscientific research. In comparison to the U.S., this paper analytically describes how different ethical frameworks in Chinese governance are resulting in categorically different choices about investment into future energy options. Of particular note are the different ethical obligations the Chinese Government derives from culturally specific attitudes towards nature, particularly in coming to terms with what "sustainability" means for a country of 1.4 billion people.

END

12.6 Engineering Studies: Gary Downey (chair)
        Papers by Gary Downey (chair), Darin Barney, Antonio Garcia, Eva Amdahl,
        Paulitz Tanja, Jonathan VanderSteen, Nicholas Sakellariou

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Distance from Manual Labor: British Improvement, English Character, and Engineering
Formation, 1760-1914

The paper examines the emergence and evolution of the dominant identity of the engineer
across the territory initially understood as England and then expanded to become Great
Britain and the United Kingdom. Tracing the development of modes of engineering
formation, it examines correlations between, on the one side, the evolution of dominant
expectations that engineers are relatively low in status, associated with practical
knowledge, and tend to work in the private sector with, on the other side, broader
struggles over what counts as progress in society. The dominant metric of advancement
in 18th century England was individual distance from manual labor. Following the
struggles of engineers highlights an emergent tension in the 19th century between
progress as material improvement, associated with Britain, and progress as the revelation
of character, associated with England. In the United Kingdom, engineering is British.

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Living up to the code: engineering as political judgment

Nearly every code of professional ethics used in engineering begins with an affirmation
of the engineer's obligation to hold paramount the safety, health and welfare of the public
in the performance of professional duties. Thus, engineering ethics demands that they ask
themselves (and others), as part of their professional practice: what is the public welfare
and how might my design choices either serve or undermine it? This paper asks what it
would mean for engineers to live up to a demanding interpretation of this fundamental
ethical commitment, and explores the contribution engineering education might make to
enabling them to do so. We begin with an historical account of the codification of the
paramountcy of public welfare in the canons of engineering ethics, and look at how this
principle has (or has not) been applied in engineering codes around the globe. We then
look at what consideration of public welfare might mean for engineering practice,
particularly with respect to implied accounts about "the good life" and the role of
engineers in defining and designing for it. Finally, we consider the implications for
engineering education in general and engineering ethics in particular, by asking what

changes might be appropriate to this broader and, in many ways, more provocative approach to the fundamental canons.

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STS problems in Colombia

During the last five years an interdisciplinary group of scholars have designed and offered a course in Technology and Society at the Universidad de los Andes in Colombia. Unlike other institutions where STS courses have been intended to engineering and science students, in Los Andes the course was offered from the Engineering School to all the students of the university (Economy, Management, Social Sciences, Humanities, Medicine, Law as well as Science and Engineering). The course has been based in the development of cooperative research-debate over two case studies in Colombia: the future of urban transportation in Bogotá and the challenge of de-mining the country in the midst of an ongoing internal conflict. In this paper we systematize and present the knowledge co-constructed with the students on these two cases during the last five years and the challenges they pose to the STS community at large. Our main finding is that to the various aspects of the principle of symmetry a North-South dimension should be added. Additionally, the participation of an artist in the teaching team has provided the opportunity to reflect on the aesthetic dimensions of technological systems which has added depth to the readings of the urban spaces and has enriched the analysis of the various campaigns against landmines.

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Changes in the performance of engineering work?

For a long time it has been said that an engineer has to manage several professions, something which could be called "the engineer's new everyday life" or the heterogeneous engineer (Summerton 1998). In professional firms the hired engineer has to be able to provide good solutions for their clients.

An important question is how do the project members communicate and cooperate, since

projects often consists of several different actors and various roles, which the engineer has to deal with. The engineers, as other professions, perform their work with a basis from their knowledge, drawing on a distinctive occupationally defined body of expertise and own experience. In relation to this the engineers have to take into consideration the co-workers and clients expertise, included the organizational and technical knowledge encoded in programs, routines, cost estimates and the managerial discourse. This implies that the workday is complex, and consists of many different tasks where the expert knowledge only is one component. The ability to juggle with many different tasks, people, communication, purposes and so forth will be an important ability, which is not a subject taught at the polytechnical institutes. Is it possible to speak of a gap between praxis and education, and how does this affect the way we think about the engineering profession? The purpose of this paper is to discuss how the engineering profession develops various strategies to handle the changes in the engineering role, by using several case studies from Norwegian engineering firms.

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'Parasitic' dependencies, powerful alliances and 'boundary work' in engineering

The paper focuses on "boundary work" (Gieryn) in engineering, in particular in the course of the professionalization of engineering as an academic discipline in Germany. The continued historical debates about the relationship between technology and science, technology and arts etc. were a constitutive and productive dimension of the modern technological field, i.e. of a field of knowledge that counts as genuinely technological.

Today's study of boundaries in engineering and ICTs adress predominantly the dualism between the technical and the social referring to insights in the mutual co-construction of technology and society. The paper follows these perspectives in recent technology studies that allow to challenge the engineer's claim for the neutrality and the objectivity of technology. It suggests to take a closer look at the professional cultures of mechanical engineering on an epistemic level. How is the "culturescape" in engineering constructed?

On the basis of two case studies the paper presents how the boundaries between the natural and the artificial were illuminated and negotiated in late 19th century engineering in Germany: the case of the early controversies about the concept of the "machine" in mechanical engineering and the case of the kinematic studies on 'biomechanics'. They both show that boundary work took place under particular conditions. Being on the margins of academia the engineers were not in the position to defend well-established demarcations like scientists did. The paper examplifies rather the engineer's discoursive struggles as an epistemic interplay between parasitic dependencies, powerful alliances as well as troubled and shifted boundaries.

Jonathan VanderSteen
Queen's University
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Social Justice, Social Location and Engineering Curriculum

The predominant models of engineering education do not sufficiently equip students to engage in or become cognisant of social justice issues. According to a recent National Academy of Engineering (NAE) survey, engineers tend to be given little credit for works that improve the general quality of life for all, protect the environment, or indicate an involvement in community concerns. This papers articulates the need for and means of integrating social justice concerns into engineering curriculum, highlighting the benefits and potential limitations such an orientation may have on engineering education.

Drawing on qualitative research with a diverse group of engineering educators, students, potential employers, and potential beneficiaries of human development/engineering projects, this research indicates a need for curriculum change regarding the societal roles of engineers. Based on gathered data, while there is some scepticism as to the effects the incorporation of social justice concerns may have upon the root causes of inequality, changes in engineering curriculum will assist students in becoming aware of their own social location and how this connects with the social implications for their future work. Further, this paper suggests that these changes to the engineering curriculum create opportunities to work for poverty reduction, disaster relief and human development as a potential means for social transformation.

Nicholas Sakellariou
Virginia Tech
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Nineteenth Century Engineers and the Greek State

The main purpose of this presentation is synthesizing the profile of the nineteenth century Greek engineer via the rising elements of a comparative study that focuses on the relevant secondary literature as well as on new historical data. On the basis of facts, institutions and ideologies that comprise the connected framework of reference, I intent to reconstruct the first chapters of the modern Greek history in general, and the history of the emergence of the engineering profession in Greece in particular. Reflecting upon the subject Nineteenth Century Engineers and the Greek State, I tried to contribute to answering the following questions: Who were the Greek engineers at that particular era? What was their work consisted in? How can the professional category of the 19th century Greek engineer be socially translated? The formation of the state, along with its constituent material and ideological context, the field of the public works and – undoubtedly– the evolution of a school such as Polytechneion,, in the long run, give the pitch of a course whose end points to the last twenty years of the century. With respect to this very period I speak for the emergence of the Greek engineers as a structured socio-

professional category. More precisely, the genesis of the engineering profession in Greece is considered to be strongly connected to the formation of the public space and the material imprinting of the state in engineering projects and institutions. To this effect, it also relates to the administration's intention to unify the national territory. The study has showed that under the category 19th Century Greek Engineer fall two types of men bearing significantly different characteristics. Original data regarding those men have directed me to new grounds for speaking about a "technically oriented love for the country".

END

12.7 Articulations of Value in Contemporary Technoscience

Organizer/chair: Sheena Nahm
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Andrea Ballestero, University of California Irvine, aballes at uci dot edu

This panel explores the ways that health and life itself are becoming crucial sites where value materializes in contemporary technoscience. By "value", we refer to market value as well as intangible forms of symbolic or ethical value. While the materialization of value around health clearly matters in the case of pharmaceuticals, we are also interested in examining other sites where a "health theory of value" might be relevant. These sites include nutrition, water, play therapy and yoga. For example, nutrition has been appropriated by agricultural capital at the same time that it has become a site for the articulation of corporate social responsibility. Similarly, water in Latin America has become both privatized and articulated as a fundamental human right; play has become both a trademarked practice of therapeutic intervention and expressed as a basic childhood need; and yoga has become subject to intellectual property protection while some actors attempt to preserve it as traditional knowledge in the public domain. We suggest that the double articulation of value, expressed in diverse domains and materialized around health or life, is crucial to the value-form of neo-liberalism. This double articulation depends upon epistemic practices and expert regimes – whether clinical trials, biofortification, water management, psychotherapy, or yoga schools – and allow us to "know" value in very particular ways.

Jill Fisher
Arizona State University

"Entrepreneurial Agents or Pharmaceutical Emissaries?: Private Practice Physicians and Contract Research"

In the past two decades, the pharmaceutical industry has reorganized the clinical testing of its products. Currently, the vast majority of studies (~70%) in the United States are conducted in the private sector by non-academic physicians who recruit their own patients or local community members into the drug studies. The expansion of pharmaceutical clinical trials in the private sector is made possible by the decrease in revenue physicians make by practicing medicine. U.S. physicians report diminishing income due to restrictive relationships with insurers and government agencies, ever-increasing malpractice insurance premiums, and inflated overhead costs to operate private practices. As a result, many physicians are attracted to pharmaceutical contract research because it is perceived as a lucrative field. This paper examines the constraints that are imposed on physicians as part of conducting study protocols. The focus of analysis will be on the tension between the identities physician investigators actively construct of themselves as entrepreneurial agents and the structural constraints that

prescribe how these physicians conduct drug research, casting them simultaneously in the role of pharmaceutical emissaries. This paper argues that physicians must be entrepreneurial to establish successful research businesses and navigate through the competition that has arisen in the private sector. It also illustrates that by accepting research contracts, physicians relinquish their authority over healthcare decisions, so that they become consumers and advocates of pharmaceutical products, including both products under investigation and other products of the companies for whom they are working.

Kaushik Sunder Rajan
University of California Irvine

The Values of Experiment: Biocapital, Surplus Health, and Clinical Trials in India

This paper is part of an ongoing thought experiment with Joseph Dumit (UC Davis) that attempts to make sense of the ways in which health becomes the locus of value in biocapital. The experiment is, in part, the employment of a fundamental methodological lesson from Marx, who insists upon an analysis of the value-form as a starting point for an understanding of capital. For Marx, value manifests itself, in the particular political and historical moment that he is writing, in labor. Hence, he comes up with the labor theory of value, which is, as much as anything else, a treatise for his time (industrial capitalism) and place (primarily Europe). The labor theory of value manages, at the same time, to signify some general structural logic of capital and to be a very specific, historically situated articulation of the way in which the value-form emerges in industrial capitalism.

We have, through juxtaposing readings of Marx against ethnographic investigations of clinical trials in the United States and India, been attempting to come up with a "health theory of value" as an experimental hypothesis. My paper will speculate upon clinical trials as a set of epistemologies and practices that serves as the machinery through which value gets generated in biocapital. This value, I argue, gets materialized through Health, which in the process itself becomes an abstraction that claims to operate in the cause of pastoral care, but in fact is driven by logics of surplus accumulation.

Elta Smith
Harvard University

"Generating health and value in corporate agbiotech: the case of Golden Rice"

Coinciding with the pharmaceutical industry's increasing focus on generating health through anticipatory treatments for illnesses not yet realized, scientific research in agriculture is turning towards improving the nutritional and therapeutic quality of food crops. Advances in biotechnology—particularly through genetic engineering and genomics—have allowed scientists to imagine and create plants that produce vaccines as well as elevated levels of micronutrients including vitamins A and E, iron and zinc.

Corporations are heavily involved in this research, and articulate their role as two-fold: first as capitalizing on an expanded market for such products, particularly in the United States and Europe, and second as socially responsible global actors who donate research tools and products for nutritionally and therapeutically enhanced plants to countries where particular problems are considered to be endemic (South Asia and Africa are often-cited cases). In this way, corporate actors portray themselves both as profit-maximizers in the neo-liberal mold, and as benevolent stewards of the public interest. This paper explores the case of Golden Rice, looking particularly at the involvement of the multinational corporation, Syngenta, in its development and production. Created to produce increased levels of beta carotene, which the human body converts into vitamin A, Golden Rice is a prominent project propelled by the promise of reduced malnutrition and more generally, of plant genetic engineering for health. I use the case of Golden Rice to address the intersection and implications of health generated via agriculture and the corporate articulation of an expanded notion of value in international agriculture.

Andrea Ballestero
University of California Irvine

"Shaking bottles within the global scene: water's unruly value in neoliberal politics"

Already beyond privatization discussions, today's international water debates are centered on the definition of best governance frameworks through which the value of water can be captured, domesticated, and diffused. Rather than being reduced to financial gain, the value of water is magnified until it becomes abstracted as life itself. Thus, international networks of policy experts, such as the World Water Forum, debate how to create good policy to manage water/life. In this paper, I analyze an in house protest that water activists held during the IV World Water Forum in 2006 where, by shaking empty water bottles filled with coins, activists call for the declaration of water access as a human right and its protection as a key resource for

ecosystems. I will examine how water, refracted as life itself, becomes a site of techno-legal struggle because of its unruly material and epistemological condition. Not being nature, a right or a commodity proper, water's value constitutes an excess for contemporary global politics. It becomes life itself. The paradox I examine, nevertheless, is that in its unruliness and excess, water/life is governed in its "universal" form as human right, and in a "particular" form as a technological prescription to integrated management.

Sheena Nahm
University of California Irvine

Right to Play, Playing Right

In contrast to pharmaceutical treatments where efficacy must strike a balance between maximum impact and toxicity, play therapists can argue that "just playing" ultimately

does no harm. However, the efficacy of this psychotherapeutic treatment must go beyond the disclaimer of "just playing" to demonstrate the work that goes into regulating, standardizing, and transforming practices. As play (in its therapeutic form) is implemented in numerous countries, its therapeutic value and universal efficacy for people with attachment disorders is affirmed while its flexibility in incorporating socio-cultural aspects of diagnosis and treatment allows it to continuously adapt to the particularities of another region. At the same time, play in-and-of-itself is described as a valuable human activity in documents like the Universal Declaration of Human Rights. Play becomes a site of articulating which factors are necessary for a child's psychological, biological, and social development. The "right to play" serves as a marker for well-being, childhood, and life itself. This paper explores the ways in which "play" is constructed as a category of and for health. I examine how play therapy functions as both an alternative to more invasive therapeutics while also striving to gain the same kind of medical legitimacy.

Allison Fish
University of California Irvine

Author(iz)ing Yoga: The Piracy of a Nation's Cultural Heritage and its Subsequent Digitization

Issues surrounding the protection and exploitation of traditional knowledge through intellectual property rights (IPR) are increasingly debated and the legal frameworks developing in response will have wide ranging social, economic, political, and scientific impacts. Some nation-states, such as India, are particularly concerned that legal actions taking place in dominant states and this broader harmonization of law will result in the unethical and inequitable management of the traditional knowledge they claim as their own.
This paper explores how the practice of Indian yoga is becoming a global commercial industry and how this phenomenon provides a space for the innovative application and extension of IP management tools by different parties attempting to place this practice in either the public or private domain. Specifically, the paper explores how transnational commercial yoga:

1. Has emerged in the legal and ethical framework of global capitalism,

2. Has developed into a valuable, competitive market commodity where rival actors secure financial interests through novel application of traditional IP claims, and

3. Has caused the Indian state to respond, through the construction of a digital yoga library, to what it claims is the continued piracy of its national-cultural heritage.

In essence this paper addresses how yoga, as a controversial entity, has provided the impetus for the expansion of IPRs as different actors, both private and public entities, develop tools to convert this distinctive type of information-knowledge into a proprietary object.

Discussant: Kristin Peterson
Michigan State University

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12.8 Knowing Stem Cells: Multiple Meanings in the Standardisation, Understanding, and Regulation of Stem Cell Materials

Organizer/chair: Neil Stephens
ESRC CESAGen, Cardiff University
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Stem cell scientists and stem cell regulators are faced with the ambiguities of an uncertain science. This panel provides a forum to analyse the multiple ways of knowing stem cells in the context of their therapeutic development and governance. The papers share a range of themes. These include the diverse translations of stem cell research, the consolidation of multiple understandings of stem cell science, and the management of wider expectations of regenerative medicine technologies.

While sharing these interests, the authors present their findings based on different empirical settings. These include translational research in a range of disease settings; the standardisation of stem cell characterisation – securing the very meaning of what a stem cell is; the consolidation of international standards in stem cell banking; the commercialisation of haematopoietic stem cells; the interface between GMP standards and the meanings of cells and embryos; and the shaping of stem cell science by EU regulations.

The panel brings together contributions from authors affiliated to the UK's Economic and Social Science Research Council's Social Science Stem Cell Initiative and the Stem Cell Capacity Building and Awareness Raising programme. The range of author's interests provides an opportunity for discussing wider issues including the inter-relatedness of ways of knowing and ways of regulating, processes of standardising uncertainty, and the shifting (re-)categorisations of stem cell science.

Lena Eriksson, Andrew Webster
SATSU Dep of Sociology, University of York

Standardizing known unknowns

Establishment of standards in regard to the characterisation of Human Embryonic Stem Cell (hESC) lines throws up a host of interesting issues. Scientists are presently attempting to agree on and develop culture standards for the field as a whole - to decide and standardise environments, techniques and material for how cells are grown and manipulated. This endeavour is, to some extent, an exercise in standardizing the unknown, not least due to the curious temporality attached to the concept of 'pluripotency'. Furthermore, the everyday and mundane work of culturing stem cells is characterized by uncertainty about protocols and materials, which in part is a reflection of their very diversity. These standards are both procedural and terminological and work to define the very quality of hESCs. In studying the development of varying types of standards it is apparent that some knowledge is deemed to me merely 'technical' whereas

other epistemic undertakings are considered 'scientific'. Thus one can then detect different ways of knowing, or, more correctly, not knowing, that pose different types of challenge and reward, and which in part are contrived through the construction and mobilization of different types of standard. In this paper we present some findings from the project Quality Assured Science: The Role of Standards in Stem Cell research.

Clare Williams, Steven Wainwright & Kathryn Ehrich
King's College London, University of London

Human embryos as boundary objects: exploring the interactions between the social worlds of pre-implantation genetic diagnosis and embryonic stem cells

In this paper we offer some reflections on embryos, human embryonic stem (hES) cells and pre-implantation genetic diagnosis (PGD). We draw upon four ethnographic studies of the social practices of PGD and embryonic stem cell science in the UK (funded by the Wellcome Trust and the ESRC), arguing that both fields are productive domains for the exploration of the changing nature of science and society. Firstly, we examine the notion of boundary-objects as an approach for understanding the social construction of embryos. Secondly, we analyse the ways in which embryos and human cells have similar and different meanings in the related social worlds of stem cell science and PGD. Thirdly, we explore the increasing alignment between these worlds being brought about by the shift to GMP (Good Medical Practice) production of hES cell lines from PGD and other types of embryos. In conclusion, we argue these ethnographies are salient case studies of the production of biomedicine as a socio-material practice in the emerging sphere of new regenerative medical technologies.

Alison Kraft, Paul Martin, Nik Brown,
University of Nottingham, University of York, University of Nottingham

"Translating" the Haematopoietic Stem Cell (HSC): A Case Study of Stem Cell Innovation

Abstract:

UK bioscience policy currently places great emphasis on the process of â€˜translatingâ€™ basic medical research into practice. Here we discuss critically a number of embedded assumptions about the relationship between the laboratory and the clinic, and the role of basic research in driving advances in stem cell therapy. Focusing on the development of HSC-based therapies from the 1950s to the present, we analyze the evolving socio-technical networks of innovation - what might be called â€˜communities of promiseâ€™ - within which these therapies arose. By exploring the factors that shaped the dynamics of innovation and the relationship between bench and bedside in these settings, we hope to contribute fresh insights on â€˜translationâ€™. In light of this historical case study, we also discuss the limits of â€˜translationâ€™ as a metaphor for capturing the complex articulations between lab and clinic, between

scientific knowledge and clinical utility/practice that are constitutive of medical innovation. From this, we endorse recent calls for a more nuanced engagement with and understanding of knowledge flows between bedside and bench. The relevance of this case study for contemporary policy debates about stem cell futures is discussed.

Steven Wainwright, Clare Williams & Mike Michael
King's College London and Goldsmiths College, University of London

Paradigm shifts in stem cell science? Reflections on scientists' perceptions and practices on human embryonic stem cells as a cure for disease

In this paper we explore social, medical and scientific aspects of the emerging field of stem cell research. We argue that the conceptual schema of Pierre Bourdieu (and in particular his notions of field, habitus, capital, and illusio) is a novel and fruitful approach for understanding 'the evolution of a revolution' in the nascent field of human embryonic stem (hES) cell research. We draw upon our ESRC funded ethnographies of the problems and prospects of hES cell science in the fields of neuroscience, liver disease and diabetes. We explore the views of scientists in some of the leading stem cell labs in the UK and the USA and we argue that initial expectations of a revolution in regenerative medicine have been damped down by the difficulties of making functioning cells from hES cells. We explore how scientists are beginning to argue for a paradigm shift, from a stem cell transplant approach to a disease in a dish (i.e. stem cells as tools for unravelling mechanisms of disease and for drug development) approach to translational research. We examine three contested strategies for creating disease in a dish hES cell lines: 'therapeutic cloning', pre-implantation genetic diagnosis, and genetic bioengineering. In conclusion, we contend that a Bourdieusian approach has much to offer Science Studies.

Neil Stephens, Peter Glasner, Paul Atkinson
ESRC CESAGen, Cardiff University

Sharing Standards in International Stem Cell Banking: 'Sameness' and 'Difference' at the Spanish and UK Stem Cell Banks

In 2002 the UK Stem Cell Bank opened as the first publicly funded open access international source of human embryonic stem cell (hESC) lines. The second – the Spanish Stem Cell Bank – has recently been established, and maintains a close partnership with its UK counterpart. This paper explores how this relationship produces 'sameness' and 'difference' in the practices of stem cell banking in different national settings.

Both Banks are committed to pioneering international standards in the Quality Assurance

of hESC lines. In this paper we unpack the stability and durability of these standards as they are transferred from the UK to the Spanish regulatory setting. We ask how this translation is managed and who are the important actors? Which practices successfully translate and which do not, and how does this shape the storage and mobility of hESC material?

We then explore the varying conceptions of what standards mean and do, and how these understandings are shaped by the differing national governance structures and localised practices of work. The paper draws upon ethnographic fieldwork conducted at both the UK and Spanish Stem Cell Banks to demonstrate that, as well as multiple ways of knowing, there are multiple ways of regulating, recording, and accrediting the international movement of stem cell material.

Ingrid Geesink
ESRC CESAGen, Cardiff University

Regulation by the Backdoor: Conitology at Work in the Development of European Union Regulatory Policy for Human Tissues and Cells

The development of EU regulatory policy for human tissues and cells has rovoked debate about the legal status of ethical considerations in governance. In this context I discuss the Tissues and Cells Directive (2004/23/EC) and its subsequent technical annexes (2006/17/EC and 2006/86/EC) which set requirements for quality and safety aspects of donation, storage and distribution of human tissues and cells.

A vulnerable friction exists between the need for clarity of regulatory decision-making and demands for flexibility in legislative arrangements to accommodate socio-technical uncertainties of innovative health technologies. This is because decisions are made in two regulatory settings with different remits: the legislative cycle including the European Parliament as exponent of democratic transparency versus the complex EU committee system providing fewer options for public scrutiny. In comitology committees expert representatives from Member States assist the Commission in decision-taking on the detail of implementation of Community laws and the adaptation/updating of EU legislation in order to take account of technical developments. Comitology has been described as a 'Trojan horse' for national interest representation, and as embodying the most opaque and even secret part of EC decision-making. By exploring multiple meanings of knowing and regulating human tissues and cells, I discuss the ambiguity in the EC's attempts in dealing with uncertainty and complexity in its regulatory policies.

I conclude with suggesting an alternative STS view on expertise systems in the EU regulatory context, where assumptions about the democratic deficit take account of the tensions created by national representations regarding contested cell sources.

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12.9 Network Ethnography

Organizer/chair:
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T.L. Taylor
IT University of Copenhagen, Denmark
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Anne Beaulieu, Virtual Knowledge Studio, KNAW, Amsterdam, The Netherlands,
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Ethnographic approaches have been embraced by STS for over two decades to address 'science as practice' and to understand 'use in context'. As such, ethnography is part of the core ways of knowing of STS. The idea of fieldwork, a key element of ethnography, has been revisited and revised recently. Rather than travelling to a place of study, ethnographic practices are being constituted as travelling along. Sites are being reconfigured as networks, a shift that prompts a consideration of the ways researchers locate not only their projects, but themselves, across a web of sites, practices, and complex infrastructural, social and material contexts. With the emergence of many of these sites, researchers directly deal with play or lively (affective) engagement, as well as with huge amounts of countable traces in a mediated field. This session addresses these new conceptualisations of the field. More than a showcase of methodological novelties, this session focuses attention on the assemblage of new fieldwork practices, researcher subjectivity, and insights into knowledge and technology that such a new way of knowing can bring.

The session includes contributions on the study of distributed practices/networked technology; issues of engagement and of material context; the intersection of play and practice; the increased importance of time. Looking at a range of research objects - from games to mobile phones - presenters will explore how network ethnography, which draws the researchers along and locates them across distributed field sites and practices, prompts interesting and particular challenges for STS.
Other technology

Anne Beaulieu
Virtual Knowledge Studio, KNAW, Amsterdam, The Netherlands

Taking Time: Ethnographies, Networks and Knowledge

This presentation addresses the use of time to constitute and understand the ethnographic field in the study of knowledge creation. A focus on time means paying attention to time cycles, to rhythms of academic work and to events in time. These elements constitute a way to explore and understand meaningful social relations in a field that is highly mediated.

As a strand of virtual ethnography, this 'way of knowing' is proposed as an alternative to

participant-observation as elaborated through a focus on the space of the lab that has dominated the STS tradition of ethnographies of knowledge production. This presentation therefore addresses the methodological aspects that accompany a problematisation that does not focus so much on the place of science, on discovering what is going on in the laboratory,. It explores an ethnographic practice that constructs a field site by focusing on when, rather than where, is there something happening, when is there sociality, creation, discovery.

To illustrate this approach to ethnographic work, I draw on an ongoing study of a group of humanities scholars around the creation and use of a digital resource, TravellingConcepts.net. The presentation addresses how various aspects of fieldwork, like presence in the field, engagement and perception of actors can be cast in terms of time. It also notes particular conundrums thrown up by the use of time as an organizing motif: stabilization, persistence, not-being-able-to-stop and slowing down the field.

Danah Boyd
School of Information, University of California-Berkeley & Annenberg Center for Communications, University of Southern California

Choose Your Own Ethnography: In Search of (Un)Mediated Life

In his essay on thick description, Geertz (1973) offers an anecdotes concerning infinite recursion to help the reader understand the complexity of culture. "There is an Indian story - at least I heard it as an Indian story - about an Englishman who, having been told that the world rested on a platform which rested on the back of an elephant which rested in turn on the back of a turtle, asked (perhaps he was an ethnographer; it is the way they behave), what did the turtle rest on? Another turtle. And that turtle? 'Ah, Sahib, after that it is turtles all the way down.'"

This view of culture and knowledge, while relieving to some, produces an image that culture is stacked layers. While the depth is surely infinite, it seems possible to truly understand a layer or so. I too held this view when I embarked on my two year ethnography of teenage culture and MySpace only to be faced with a different topological space. Trying to locate myself and my questions in a fast-moving (if not exploding) phenomenon full of people moving between virtual and physical spaces, resulting in shifts of geography and time proved overwhelming. Ethnographic eureka came when I accepted that Heisenberg's uncertainty principle applies just as much to ethnography as it does to physics. Participant/observation in a networked culture requires the ethnographer to be a node, a position that inherently alters the graph of the culture being studied. I will examine the challenges I faced trying to follow the bleeding edge, traveling along with teenagers as they immersed themselves in and altered the development of MySpace. I will reflect on my methodological decisions and analyze how they affected what questions I could and could not ask.

Søren Mørk Petersen

IT University of Copenhagen, Denmark

Fields of Materiality

In recent years, ethnographic methods within cyberculture studies have become more widespread, primarily resulting in the break down of the distinction between on- and off-line. The internet is no longer taken at 'interface value', instead the interface and the assemblage of which it is part, have been taken into consideration, hereby making ethnographic work 'multi-sited' (Marcus, 1995). This move can be thought of in a lot of different ways; as rhizomatic (Marcus, 1995), as applying a strategy of the `and, and, and, and...' (Viveiros de Castro, 2003) or as a strategy of the `flat-list' (Fuller, 2005). All these approaches focus on the material aspects of cultural practices, and they will be my guide in the conceptualization of the field and media technologies.

Based on my prior fieldwork among broadband internet users and ongoing research among mobloggers and users of photosharing sites (flickr.com and 23hq.com), I consider how to account for material aspects of computing. Special attention is given to the materiality of everyday life, rather than embodiment, which was the focus of internet research usage in the 1990's. Often when material aspects of the internet are considered within cyberculture studies, the talk is on the body and what happens to it in the transitions between physical and nonphysical spaces. When we constitute the field as a network by expanding the boundaries of the internet, beyond what happens onscreen, the internet becomes a part of a much larger assemblage of which a lot of aspects are material, not just bodily.

T.L. Taylor
IT University of Copenhagen, Denmark

Bricolage, Play, and the Games Researcher

Drawing on my ethnographic work in virtual worlds and massively multiplayer games, I will discuss some of the issues that arise when working across digital and offline venues in these spaces. Games researchers, especially those working in the multiplayer genre, often place themselves in affective networks and become playful participants in the sites they are researching. And yet being involved with these games is not a matter of simply going to them and capturing data, but constructing an experience and following participants across multiple systems and networks (technological and social). How might we best understand and map the assemblage of play and co-locational sites that make up game space? How can framing online games and virtual worlds as "boundary objects" assist our ethnographic work? Using my own work in networked spaces I will discuss the notion of playful bricolage as a research method.

Sally Wyatt, Peter Peters, Sanneke Kloppenburg & Wiebe Bijker

The Virtual Knowledge Studio for the Humanities and Social Sciences (VKS-KNAW), Amsterdam, and U Maastricht, The Netherlands

CK Phone home': Talking about practices and looking at lists

Within STS, the ethnographic case study continues to reign supreme, with observation, documents and interviews as main sources of data. STS has strong (methodological) roots in history and anthropology and has also developed a critique of positivistic methods. As a result, quantitative data is rarely found within STS studies, except in scientometrics and to illustrate the magnitude of an issue. However, the massive growth in digital technologies brings with it enormous quantities of data. The reasons for and consequences of this growth have been taken up for analysis by social science and legal scholars concerned with privacy and surveillance. But what possibilities do these data offer to STS researchers? What happens when we attempt to combine such detailed and extensive quantitative data with data obtained using ethnographic methods?

We draw on a recent study in which we interviewed a small number of Dutch people about their everyday mobile phone practices. In addition, we had access to their mobile phone records for a five-week period. The study focused on how hypermobile people use mobile phones to 'repair' (Peters, 2006) problems and obstacles encountered when juggling multiple tasks over distance, within tight timeframes. In this presentation, we explore methodological issues raised by combining qualitative interview data about people's experiences with mobile phones with records of actual usage. Drawing on this experience, we ask: What do these different types of data enable us to claim as researchers? What are the opportunities and challenges facing ethnographers as a result of this explosion in data?

Nina Wakeford
Goldsmiths, University of London
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Ken Anderson, People and Practices Research, Intel Corporation

Collecting visual data about temporal aspects of mobility: a study of London bike messengers

Mobility has become a central term in discussions of the future of computing, particularly in the discourses surrounding ubiquitous computing. Co-author Anderson is currently leading a project at Intel which aims to focus attention on the temporal aspects of mobility, which tend to have been underplayed with the emphasis on location-based innovation. In this paper we discuss a set of fieldwork practices that were developed to look at the everyday experiences of bike messengers in London. This project set out to explore fieldwork practices in terms of the collection and use of visual materials, including still photography, digital video and forms of mapping journeys. In the paper we look critically at the capacity of these forms of visual materials (including those which failed, such as GPS systems) to add to ethnographic research that is conducted at the

intersection of corporate and academic agendas. We look at how the fieldsite can be 'installed' elsewhere, moving it from London streets to Portland corporate cube space. Is this the future of the distributed field site?

Discussant: Bart Simon
Department of Sociology and Anthropology, Concordia University, Montreal, Canada

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12.10 Ecologies of Hope

Organizer/chair: Roopali Phadke
Macalester College
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What constitutes "resilient" environmental institutions? The panel attempts to answer this question through a collective analysis of detailed ethnographic case studies conducted around the world. The case studies examine a range of critical sectors pertaining to resilient environmental institutions, and to the theme, "ecologies of hope." They include agro-food commodity networks, fresh water harvesting, land re-distribution and reform, renewable energy, environmental justice and public health. The scholars draw from complimentary understandings of sustainable technology, alternative expertise, and hybrid knowledge networks to theorize the place for hope in our current environmental governance strategies.

Christopher Bacon
Center for Social Economy, Nicaragua

Finding hope in forgotten places: Fair trade coffee and the struggle to scale up without selling out

The problem of scaling summarizes the intense debates that accompany certifications such as organic and Fair Trade as their promoters seek to move these products from niche markets into mainstream supermarkets and restaurants. Fair Trade certified networks now include participation of more than a million Southern producers and total Northern markets worth over one billion dollars. Although these initiatives started with committed actors inspired by ideas of solidarity, empowerment, healthier food and more ecologically sound faring practices, for many they have become certified products that depend increasingly upon many of the same market systems they once sought to transform. After proposing a modified political ecology approach, this case study develops a critical and constructive evaluation addressing the impacts, appropriations and empowerment potential associated with small-holder Fair Trade coffee cooperatives in northern Nicaragua. The next section draws upon research within coffee industry to explore "innovative" partnerships intended to re-convene the trust within North-South relations and better link trade and exchange to social development processes and agroecological sustainability. The final section identifies the ideas, practices and potential pitfalls useful in the efforts to scale up positive social change processes.

Roopali Phadke
Macalester College

Water Works in India

Throughout the world, dams have become maligned as technological systems that represent state hubris, civil society mistrust, ecological disaster and human rights abuse. Among social movements struggling for water reforms in India, the Krishna Valley movement has taken a distinctive approach toward reclaiming dams as development tools. As a partnership between farmer's organizations and technical NGOs, this movement has countered the state's supply- side development model by melding oppositional politics with reconstructive efforts. By instantiating how dams can become technologies of trust, based on shared vision between engineers and farmers on the design and purpose of infrastructure, this movement is pushing broad and sweeping changes in water policy.

By examining how dams are rhetorically and materially serving new democratic politics, this case study raises fundamental questions about how infrastructure should be designed and the social principles that must undergird turning land and water into productive resources. On the broadest of levels, the Krishna Valley experience suggests how social movements can reclaim technology, and root artifacts to people and place, by creatively hybridizing local knowledge with scientific expertise.

Ariane de Bremond
Hienz Center for Science, Economics and the Environment

Land, nature and livelihoods in the making of a future: the post-war resettlement of agrarian landscapes in El Salvador

This case study provides a closer look at an aspect of land reform that often escapes purview - that is, how land use, livelihoods, and natural resource management intersect with land reform processes and their legacies, and what role is played therein by the ways that land and nature are defined and separated out. Through an exploration of El Salvador's experience with post-war land transfer this project seeks to link previously divided analyses of agrarian reform processes and environmental transformations by teasing out the specific linkages, in post-conflict resettlement, between efforts to establish sustainable livelihoods and efforts to protect valuable natural resources in their newly deeded lands. Through a case study of one repopulated community's efforts to assemble effective modes of environmental governance to protect forested lands grown from the war, this case study argues that both current-day neoliberal and populist formulations of the land reform debate have failed to understand the critical importance of linking agricultural and environmental chains of governance in attempting to grapple with rural poverty in Mesoamerica's agrarian landscapes of reform. It then goes on to describe the "positive" lessons learned from this experience, with reference to other examples of land reform.

Ben Weil
University of California, Santa Cruz

Solar City, Bike City, Growth City: Local Governance and Renewable Energy in Davis, California

The promise of renewable energy offers great benefits to the environment, local economies, and national security. This case study focuses on the city of Davis, CA, which became a model of an energy conserving and renewably powered city. Its signature development, Village Homes, combined innovative urban design, common areas, bike lanes, and passive solar heating and cooing, to create what is still a model of "green development." The enthusiasm of Davis residents for solar energy led one of the California's major electric utilities to construct an experimental photovoltaic power plant in Davis. The city now owns PVUSA, which is still producing electricity. In the 1970s Davis established its commitment to bicycle transportation with over 100 miles of bike lanes. Today, a greater percentage of Davis residents commute by bicycle than residents of any other city in the US, and the city consumes less energy per capita than any other city in California.

This case study briefly reviews the history of California energy policy and discusses key factors determining the state's failure to meet its renewable energy goals. It then explores the reasons for Davis' ability to maintain its commitment, lifestyle, and level of energy efficiency and innovation. It identifies the characteristics of Davis' political culture, infrastructure, and social institutions that led to the resilience, persistence, and continued development of the city's commitment to a conservation and renewable energy path.

Krista Harper
University of Massachusetts, Amherst

Environmental Justice in Central and Eastern Europe: Translations and Transformations

This case study explores the pressing policy issues of Roma integration in the European Union by conducting ethnographic fieldwork and rapid assessment auditing on environmental conditions, health issues, and community mobilization in four Roma communities in Hungary. Roma (or Gypsies) constitute the largest and poorest ethnic minority in Hungary and in the European Union more broadly. In Hungary and across Europe, Roma settlements face residential segregation from majority populations, resulting in disproportionate exposure to pollution and lack of access to basic water and sanitation services. Environmental justice—the recognition that the poor and ethnic minorities and the poor suffer from an unfair distribution of environmental benefits and harms —is a relatively new framework for human rights and environmental policy in Europe, and there has been no systematic data collection regarding race/ethnicity, income, environmental conditions, and environmental health to date. This case study attempts to assess the relative roles of social capital, socioeconomic status, and racial/ethnic identity in attaining a clean environment, access to public health services, and community development in Roma settlements in northern Hungary. Its findings will enable environmental organizations, Roma civil rights activists, and policymakers to develop new tools for understanding and addressing discrimination and social exclusion experienced by Roma populations. The case study will contribute to the scholarly discussion of the role of social capital and socio-economic status in sustainable

community development, and it will add a new perspective to cross-cultural comparisons of environmental justice and environmental human rights.

Dustin Mulvaney and Anna Zivian
University of California, Santa Cruz

Sowing seeds of hope in the fields of social resistance: Anti-genetic engineering activism in California

Anti-genetic engineering activism has redistributed the risk burden and changed the pace and trajectory of biotechnology and its impacts on the agro-food system. By reframing the debate as a matter of who takes risks and who benefits from biotechnology, activists have contributed to the adoption of precautionary environmental policies while emphasizing concerns about the social dimensions of technological change. Their engagements have prompted strict containment policies through sub-national regulation for some of the most worrisome biosafety concerns like the potential escape of transgenic aquatic organisms and pharma/industrial traits in food.

Through analyses of pharmaceutical rice and aquaculture policy in California, this case study argues that biosafety risks to the environment and the food system have been effectively minimized through strict containment standards, moratoriums, and bans. A form of pollution prevention has supplanted end-of-pipe pollution management principles. Anti-GE activism is also changing the trajectory of agricultural research both inside genetic engineering practices, as, for example, with open source and pro-poor biotechnology, and outside of them, by advocating local food sheds, organic and sustainable agriculture practices. These activists not only seek to regulate the industrial trajectory of agriculture and its attendant risks, but also to foster an alternative paradigm. Anti-GE activism opens and occupies new spaces for alternatives to the agricultural biotechnology research trajectory, suggesting that seeds of hope are being sown in the fields of social resistance.

Discussant Ravi Rajan
University of California, Santa Cruz

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12.11 Technologies of Forgetting and Exclusion: Case Studies in the Social Benefits of Forgetting

Organizer/chair: Lilly Nguyen
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The rapid spread of information technologies has been accompanied by a redrawing of the boundaries between the forgotten and the remembered, between that which is included and excluded from the permanent record. In the paper-and-ink world, the sheer cumbersomeness of archiving and retrieving promoted a form of institutionalized forgetfulness. However, the shift to a digital medium has changed the default position from one of forgetfulness to one of remembering, retention, tracking, and capture.

The importance of this shift can be seen in recent legislation that supports the ongoing tracking of sexual predators; in popular technologies that increasingly track and record the browsing and information retrieval habits of readers in public spaces; in mapping as quantification of locatedness and therefore a barrier to forgetting; and in the actions of individuals as they grow increasingly wary of their multiplying online identities. Collectively, these examples suggest that while forgetfulness is often framed negatively, the absence of forgetfulness creates new social uncertainties.

This panel will address these uncertainties to reframe forgetting as a social good, exploring interdisciplinary analyses of collective needs for forgetting in a digital world. Through presentations of empirical investigations, the panel will consider possibilities of forgetting as a positive social good rather than as a failure of memory. From the perspectives of legislation and policy, information retrieval, and systems analysis, panelists will discuss current practices and examples of forgetting and exclusion and their implications for future ways of knowing.

Michael Curry
Department of Geography, University of California, Los Angeles

Forgetting and the problem of location

Those who promote the social benefits of forgetting must confront the ways in which forgetting, or the destruction of information, may occur. For something to be forgotten it is necessary that some critical element of that memory be removed, and this can happen in a number of ways. Paper records may decay or be destroyed. The substrate on which information is recorded may be written over. More fundamentally, one may alter the frame of reference through which information has been understood; what remains has lost its meaning.

Yet one such change, the development of mapping systems that use quantitative means for defining location, and that replace traditional qualitative and narrative means of defining location, has raised new difficulties with respect to the possibility of forgetting. Indeed, attempts to forget information about a person or object are thwarted so long as there exists some body of locationally coded information about that object of inquiry. Acting as, in effect, a primary key within a relational database, location provides a means for interconnecting factual information with inference, and for constructing accounts of the places that they inhabit, the routes that they travel, and the people with whom they associate. This paper explores the issues raised by various forms of spatial and locational information, and the technological and social systems that underpin that information.

Ron Day
School of Library and Information Science, Indiana University

The Grammar of Forgetting in Modernity

Today, the problem of forgetting in the "information age" is the problem of reasserting new cultural forms and new agency in the midst of a selection and preservation of knowledge which follows formally homogenous ("cleansed") data, on the one hand, and traditional narrative forms for the explanation of such data, on the other. The problem is acute, given not only the trope of the "information age" as a technological and social imperative for the organization of social and personal life today, but given the extreme degree to which our lives are immersed in information technologies and in the power of the social metaphors of these devices and the cultural and social dominance of their information and communication products. This problem has been a classically modernist problem, and so this paper will examine the role that "forgetting" plays in classic, modern oeuvres and it will develop these themes in regard to new information and communication technologies today.

Rich Gazan
Department of Information and Computer Sciences, University of Hawaii

Rewriting History: Social Forgetting in an Online Question Answering Community

In online communities, where the medium of interaction is text, what you post is who you are. As collections of user-created and user-rated content proliferate, one's online identity--even masked by a pseudonym--can accumulate a considerable amount of virtual social capital and become a permanent record that many users later wish to alter or expunge. This study addresses the question of how social forgetting is managed in Answerbag, an online question answering community with over one million unique visitors per month, where users rate one another's answers to provide collaborative filtering, and can review the histories of any other user. An analysis of user requests for site administrators to change or remove their past contributions--or even to commit virtual suicide and have their entire identity erased--forces site administrators to create

and enforce a social forgetting policy in microcosm, balancing content ownership with individual rights, and sheds light on larger issues of forgetting in society as a whole.

Thomas S. Mullaney
Department of History, Stanford University

The Infrastructural Diaspora of the Self: Personhood in the Data Age

In the Data Age – characterized by a plummeting cost of memory, streamlined datamining algorithms, increasingly data-hungry behavior modification technologies, and the proliferation of asocial modes of sociality – the infrastructural traces left by the individual have grown both in number and in life expectancy. As individuals move through time and space, and encounter record-keeping interfaces and scenarios (credit card purchases, customs, doctor's visits, etc.), he or she leaves samples of self which, when taken together in their multiple types, combine to form what I term an infrastructural diaspora of the self. This diaspora is not merely a collection of inert and ephemeral traces, but rather a scattering of data spores which, when incubated by infrastructures with the means of exploiting them (or simply kept by infrastructures which lack such abilities but adopt a "wait and see" attitude), continue to live alongside the individual and, in many cases, outlive him. To understand the scope of the diasporic self, I will examine my own infrastructural diaspora, trying to map a fuller picture of how many me's there are in the world, the particular bureaus and databases where they are housed, how and why these me's have been circulated, the types of operations that are performed on them, how those me's relate or diverge from who I believe myself to be, and how those different me's – in combination with the individuals and institutions who maintain and utilize them – have a bearing on how I live my real life. Lastly, I will examine what it might mean – legally, socially, economically, politically – for a person to live an undocumented life.

Lilly Nguyen
Department of Information Studies, University of California, Los Angeles

Dialectics of Memory and Forgetting in the Digital Capture and Surveillance of Sex Offenders

In a climate of ubiquitous computing and informational capture, society has begun to valorize both surveillance and capture. The social and legal discourse surrounding the monitoring of sexual predators provides numerous examples to illustrate this valorization. Government bodies and private organizations have initiated the internet provision of offender's personal information, while state and local regulations increasingly require that these individuals wear GPS devices to continually monitor their movement and whereabouts.

Increased use of technologies to publicly distribute and share this information emphasizes surveillance, capture, and with implications for memory and forgetting. This emphasis serves to digitally etch social condemnation into perpetuity, disallowing possibilities of

forgetting. Additionally, the development of informational publicity of these offenders suggests a struggle between the social expectations to know and remember and the social capacity to forgive and forget. This presentation explores the ongoing dialectics of memory and forgetting through examination of the current legislative and social discourse on sex offenders. The dialectic and the discourse invoke ways in which social memory and forgetting are informed by digital capture, surveillance, and informational permanence.

Katie Shilton
Department of Information Studies, University of California, Los Angeles

Forgetting and the Browser: Technologies of Attention and Forgetting in Public Reading Rooms

Over time, constraints and possibilities for reading anonymously have shifted within public reading rooms. Technological trajectories of information access and surveillance, coupled with variable cultural understandings of anonymity, mutually affect the nature of reading within libraries, bookstores, and other public spaces of information sharing. For the browser – a reader who presumes to access information unquestioned and unnoticed – technologies and cultural affordances affect attention to, and forgetting of, engagement and knowledge-seeking.

This paper traces changes in technologies of attention and forgetting in public reading spaces. Over time, changes in the location and public nature of reading rooms have created the very possibility of public browsing. The ongoing shift from reading in private to reading in public has in turn inspired a number of technologies which affect the nature of anonymous, private, or "forgotten" browsing activity. Dramatic growth in the volume of books contained in reading rooms and changing technologies affecting reader's accessibility to those books have had marked effect on the ability to seek and consume information unnoticed, without mediation from figures of authority. And finally, ongoing changes in the monitoring of public browsers continue to shape the ability to browse and read anonymously. By comparing these changes, this paper argues that contemporary technologies of attention, and resultant decrease in forgetting, challenge the browser's presumption of anonymous information-seeking. This challenge threatens the ability – and the right – to read anonymously in public spaces.

Discussant: Julie Cohen
Georgetown University

END

13.1 Circulations of Medical Knowledge

Organizer/chair: Susan Craddock
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In recent years, emergent and reemergent infectious diseases have garnered increasing attention from public health and government analysts as evidenced by an outpouring of policy, epidemiological, and scholarly literature. Public health officials' alarm over the global spread of avian flu provides the most recent exemplification of fears that easily communicated pathogens may infect human populations across the globe: such anxieties have precipitated wide-ranging debates over biosecurity and appropriate measures for containing a potential pandemic, but also about immigration, curtailed mobility of vulnerable populations, the distribution of scarce resources, and the roles of both ecological and genetic change in provoking a pandemic. This proposed paper session will study these concerns in historical and contemporary perspectives, taking up the critical challenge of exploring what Warwick Anderson (1998) has called the "global circulation of knowledge" in a truly interdisciplinary way, examining the various processes at multiple levels through which vulnerabilities to and interpretive frames of infectious diseases are generated.

Patricia Lorcin
University of Minnesota

French Colonial Medicine and the Role of the Military

The aim of this paper is to broaden understanding of the ways in which scientific knowledge about French colonies circulated in France and the impact scientific activities in the colonies had on French science and medicine. The colonies of France's second overseas empire (c. 1800-1962) were important sites for the expansion of scientific knowledge. In the 19th century, military medical personnel dealt not only with battle casualties but also with fevers and epidemics whose causes were unknown at the time. To keep French colonial armies, settlers, and functionaries fit, medical personnel concentrated on trying to make the colonies a salutary space for unhindered colonization and exploitation. Here, the science of tropical medicine saw the light of day.

Susan Jones and Peter Koolmees
University of Minnesota, University of Utrecht

Debates on Cattle Plague and Bovine TB: The Roles of Germ Theory and Geography

Disease control methods are not simply based on scientific analysis of the biology of disease. The methods also depend on broader socio-economic, political, cultural, moral,

nationalistic, geographical, ecological factors as well as veterinary and medical professional interests. Cattle plague, considered endemic in the Eurasian steppes, spread to Western Europe repeatedly in the 18th and 19th centuries. Before the era of microbiological discoveries, a strict stamping out policy was used to eradicate the disease. From the late 18th century onwards, inoculation experiments were conducted, with little success. The veterinary and medical debate over the 'germ-theory' and the precise aetiology of diseases that threatened both human and animal health began around 1850 and lasted for decades. Next to eradication, vaccination regimes were introduced in livestock disease control programmes in the first half of the 20th century. Only recently, epidemiologic models were developed to take the ecological and geographical context into account.

Tamara Giles-Vernick and Samba Diop
University of Minnesota, University of Bamako

Malaria in French Soudan: Circulations of Scientific and Public Knowledge

This paper on malaria in Mali examines the ideas about malaria, human bodies, health, and environment that shaped anti-malaria campaigns in colonial French Soudan. The aim is to explore how Bamana healers, farmers, and other inhabitants of Bamako and the Office du Niger region, French medical officers, and various health workers shaped each others' knowledge and practices about malaria and its treatment during two anti-malaria campaigns. It focuses on the changing images and assumptions underpinning these diverse peoples' notions of the body, health, disease, and environment: how they explained malaria and its etiologies, and imagined the ways this illness could be controlled. The study thus takes up Warwick Anderson's (1998) challenge to colonial historians "to listen for the global circulation" of the language, assumptions, and practices of medical knowledge among diverse historical actors.

Susan Craddock, John Song
University of Minnesota, University of Minnesota

Tuberculosis Among Somali Communities: Attitudes and Experiences

The aim of this paper is to undertake an exploratory study of knowledge and attitudes towards TB and of access to healthcare among Somalis living in the Twin Cities. With few exceptions epidemiological and medical literature on tuberculosis focuses on the role of immigrants in sustaining inflated rates of TB in the U.S., with recommendations to improve screening techniques in home countries to disallow emigration of individuals with positive sputum tests or X-rays, or suggest better screening in the U.S. Missing from current studies is a contextualization of TB and immigrant experience within larger analyses of the traumas involved in immigration, current living conditions, access to healthcare, or different perceptions of disease. Our objectives are to broaden the understanding of the social and political contexts and subsequent experiences of immigration; to illuminate risk factors for TB that Somalis might encounter such as

suboptimal housing, crowding, low or irregular incomes; to get perspectives about the adequacy and appropriateness of health care resources; and to understand the spectrum of Somali perspectives on TB as an infectious disease.

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13.2 Author Meets Critics: Unruly Complexity: Ecology, Interpretation, Engagement by Peter Taylor
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Author Meets Critics

Geoffrey Bowker
Santa Clara University

Bill Lynch
Wayne State University

Sharon Traweek
UCLA

Atsushi Akera
RPI

END

13.3 General and Philosophical Issues: Lambert Williams (chair)
   Lambert Williams, Martin French, John Sonnett, Paolo Volonté, Daiwie Fu

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The Local, the Stable and the Production of New Things; Or, how to Rethink Three and a Half Decades in Fifteen Minutes

One way to narrate the last 35 years of historical, ethnographic and sociological research on science is in terms of a collectively increasing localism. To give a cluster of 'key moments', the story starts in the early 1970s with Forman's famous deployment of the nation state as a potent and privileged unit of analysis for thinking and knowing about debates on causality in Weimar era quantum mechanics. Since then, and for a strikingly broad array of programmatic motivations, we can see a move towards the ever more local. At one moment one finds the discipline set up as the privileged unit for knowing (Olesko), at the next moment the university (Warwick), or then the laboratory (Latour and Woolgar), and so on down to the very finest particularities of experimental systems inside the laboratory (Rheinberger). This creeping localism has two crucial consequences on which I focus: Firstly, particularly with the last move towards experimental systems we finally have a nice way to parse how science produces new things. Put another way, experimental systems as sketched by Rheinberger call into question what I call a 'regime of stability' that has done rather too much work in recent writing on science. Secondly, as we have moved towards the ever more local, certain units of analysis have been 'frozen out' or 'stratified' and by now appear as little more than boring, traditional and outdated. I argue that the first consequence should be welcomed and the second should not. While abrading the regime of stability was both a vital and reinvigorating move for science studies, at the same time hitching this to a strict 'hyperlocalism' is far too high a price to pay. And so I shall attempt to sketch a 'best of all possible worlds' solution to this problem, showing how the sorts of instabilities highlighted by Rheinberger as a real productive force can also be located in such units of analysis as discipline (or at least discipline subject to a substantial revaluation). I shall try to both shore up this new picture and also establish its scope by briefly drawing examples from thermodynamics, statistics, cybernetics, operations research, and the sciences of complexity.

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"Transgressing the Boundaries?: Ways of Knowing in the Natural and Social Sciences"

It has been ten years since Alan Sokal's article in Social Text sought to illuminate what the author described as a "decline in the standards of intellectual rigor in certain precincts of the American academic humanities." The ensuing science wars debated a number of issues, from ethics and publishing standards to the epistemological and ontological bases of contemporary academia itself. Some argued that the natural and social sciences belong to separate domains; others argued for more cross-disciplinary approaches. This paper aims to further this important debate by conducting a genealogy of scientific concepts as they appear in popular scientific and social scientific writing. With reference to "observation", "becoming", "multiplicity", "singularity", and "self-organization", this paper tracks the transformation of concepts as they transgress boundaries. Philosophical, sociological and public explanations of science are explored, with a specific focus on the work of Gilles Deleuze and Felix Guattari, Karen Barad, Brian Greene, and the film 'What the Bleep? Down the Rabbit Hole'. Rather than declare these either 'good' or 'bad' uses of natural scientific knowledge, our aim is to contemplate the implications of such concept and terminology cross-pollination. While supporting the call for transdisciplinarity, we are cautious about the perfunctory use of natural scientific concepts in the social sciences and beyond.

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Relativism, Relationism, and the Sociology of Knowledge.

The paradox of the sociology of knowledge is that it is both central and marginal to the social sciences. To revise Steve Shapin's 1995 title, it is "Everywhere and Nowhere." How can this be explained? To address this question, I trace two main themes forward from Mannheim's work through contemporary studies of culture, science, and knowledge: 1) that the central "problem" of the sociology of knowledge is "relativism," because SK seeks to connect ideas to social positions and contexts. This problem is often seen as a marginal epistemological matter, but it is more productive to look for ways in which the problem of relativism animates diverse empirical studies: on

incommensurability, communication between publics, intersections of discourses, and etc. 2) the "promise" of the sociology of knowledge is "relationism," which Mannheim proposed as a possible solution to relativism. In contemporary research, relationism is increasingly found in theoretical and methodological frameworks which emphasize linkages between ideas and between actors, not just reductionist ideal-material correspondences. An exemplar of relationism is the field theory of Bourdieu, and this theme is also found in other studies using semiotic and social network metaphors. By focusing on the problem of relativism and the promise of relationism, the centrality of the sociology of knowledge to the social sciences can be better recognized.

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Social constraints in science and the problem of demarcation

Through a theoretical discussion, I wish to face the old problem of demarcation from a new point of view. I aim at pointing out that there are, in fact, distinction criteria between scientific and non-scientific knowledge. I intend to investigate whether it is possible to define demarcation criteria by studying the social dimension of science. Analysing the practices through which scientists propose and legitimise their knowledge claims, it can be seen that there are social necessities that force the scientific production of knowledge to distinguish itself from non-scientific production. Science is not what scientists freely decide it should be, but what they are compelled to acknowledge it is. The paper discusses the nature of this constraint, which has a social origin but is also capable of being reflected on the cognitive contents of science. Through a discussion of the theories of Bruno Latour and Pierre Bourdieu, attention is drawn to the cycle of credibility and reliability as the crucial social mechanism determining scientific knowledge. In the concluding remarks, the theory, supported by SSK (f.e. Steven Shapin), that the credibility of scientific knowledge depends on familiarity relationships between the members of a scientific community will be refuted.

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How different can STS be in East Asian societies?

When we read standard STS case studies, most of the cases, upon which certain STS positions were constructed, are from Northern America, or Europe. But when we learn STS theories or conceptions, we are told that these theories can provide valuable perspectives to Non-Western cases. STS universals in post-colonial era?

Still, when STS cases under studies are coming from a non-Western area in the world, such as East Asia, when societies of that area share similar cultural and colonial history, similar geological and biological compositions, plus similar socioeconomic and political

positions in relation to the West, it might be reasonable to expect STS theories different from the Western kinds be constructed from these cases. But how different? Naturally, there are constrians in science, technology, and "reality" such that the difference won't be so big as different value systems. On the other hand, East Asian colonial histories, plus the contemporary Western dominance in science and technology, are still a undeniable reality that cannot easily deconstructed by post-colonial theories of technoscience. In this sense, perhaps notions like center and peripheries are still useful, and quite valuable in understanding the peculiar middle position of East Aisan nowadays.

A new journal, called East Asian Science, Technolgy, and Society (EASTS), based on close cooperations between STS communities in Taiwan, South Korea, Japan, and the West, is about to lunch from East Asia, Taiwan. How different from standard STS journals can this EASTS be? This article would explore these questions of STS difference, technosciences, and modernities.

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13.4 Memory and Technology: Jackie Orr (chair)
    Papers by Jackie Orr (chair), Yuya Kiuchi, Chloe Jackson, Andrea Dooley

Jackie Orr
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Memory Chips: Remembrance & Oblivion as Technosocial Projects

Born in 1960 out of the belly of the U.S. semiconductor industry, the integrated circuit is a material basis for the communications systems, the weapons systems, and the memory systems networked into the 21st century. Sponsored largely by U.S. military contracts during the first decade of its existence, the integrated circuit brings together on the same plane, etched within a single crystal, previously separate components of electro-techno communication. Bringing together on the same conceptual plane the fields of trauma and technoscience studies, this paper will explore the technopolitics of memory (and forgetting) in the transnational context of integrated circuit design today. Against the historical background of Cold War relations between psychiatry and cybernetics—when neural networks began to be conceived as electrical circuits—the paper will look at how memory today is modeled as the circuiting and storage of information. Where does trauma live when memory is dis-assembled and re-assembled as technoscientific trafficking in information? How is trauma healed within such techno-psycho-social logics of oblivion and remembrance?

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Online Archives for Ethnic Community Memory: African Americans in Boston

Online video clip archives store digitalized personal and community stories. Ethnic communitie s have taken advantage of this aspect of the Internet to answer questions that many immigrants have asked as they moved to a new country where they faced hostility and discrimination in history. "How do we know that we worth something in this world?" "How can we remember our history and pass over to the next generation?" The answer to these questions has often been, "storytelling." After cable television enabled the production of community-level collective memory in the mid-twentieth century, the Internet further facilitated the production and airing of such memory in a public domain. Focusing on the African American community in Boston, my paper will show how storytelling is now possible online and how ethnic community members use this technology to remember their personal memory, family heritage, community events, and other material that are perceived as inconsequential content by broadcasting media are now online as a collective reminder that their stories matter as much as what appears on mainstream television; their stories are there to stay. I explore the process of community memory creation and the consequence of having such memories. I also examine what people leave out of their story, how they interact with other people's memories, and

community members trust their peer stories more than mainstream media. This paper will help us understand the significance of online archives and how they add to ethnic collective memory, particularly focusing on its contribution to their sense of self-worth.

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Changing Memory, Changing Self: The Effect of Legislation on the Inclusiveness of Historic Site Designation in the U.S.

Monuments to the collective memory of a nation function as markers or images that facilitate discourse around the objects (both present/remembered and absent/forgotten) and can be experienced to some extent across groups and across generations. Accordingly, every monument has a place in the respective nation's story or discussion of its past and contributes to the identity assumed by the title of the nation (i.e., American as a title). In the United States, the National Park Service (NPS) is responsible for both recognizing and preserving historic sites that are significant to the "American Story." The presented research utilizes the National Register of Historic Places (administered by the NPS) to explore the effects of changing legislation on the conception of "historic" and "significant," and on the number and type of sites designated and preserved as part of the story. Furthermore, the results suggest a degree of malleability in a nation's memory of its past and knowledge of self (self-identity), and exclusiveness of inclusion as defined by the qualification criteria.

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Representing the Unimaginable: Public Genocide Memorials in Rwanda

Theorist Andreas Huyssen argues that memory does not only exist in the past, a neutral agent of "true" events, but rather, "It must be articulated to become memory." For Huyssen there is a "fissure between experiencing the event and remembering it in representation which is unavoidable." It is in this fissure between what is experienced and what is represented where memory exists. But what if the event being considered is overwhelming, catastrophic, and, by its very nature, defies memory? What if the event is unimaginable? This notion of an event that resists articulation is central to the act of genocide, which seeks to leave no physical witness to the crime. Dori Laub asserts that "the inherently incomprehensible and deceptive physiological structure of the event precludes its own witnessing, even by its very victims."

What are the strategies for representing such a momentous event considering the challenges of articulation and representation? Is it possible or even desirable to create a public memorial that can act as a stand in or symbol for the event itself? How do survivor populations attempt to intervene in and represent the unimaginable? These

questions form the basis of my inquiry regarding ongoing memorial work concerned with the Rwanda genocide of 1994. I will argue that in this context a need arises for a new type of representational strategy, one outside of a traditional construct. These Rwandan memorials are attempting to bridge the fissure between experience and representation and thereby expose the unimaginable.

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13.5 Life, Death, and Dying:
Chair: Corinna Jung
        Papers by Corinna Jung, Anna Durnova, Graciela Nowenstein, Matt Wray

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Living and Dying in a Technical World – the Public Discourse about Advance Directives in Germany

In Germany, more than two thirds of all cases of death happen in hospitals and nursing homes. And thus there are discussions about the continuation or abandonment of life support. This is why many people think about the end of their life and ask themselves how they would wish to die.

In order to answer these questions on a legal level, there were two political commissions concerned with advance directives (declarations of wishes concerning the medical treatment for the case where one may no longer be able to give consent) which were to prepare recommandations for the German Parliament and the Government.

Their results showed one point especially: the huge variety of positions between self-determination and life-protection. While the one commission was pro protection of life and wanted to allow the discontinuation of life support only for irreversible diseases regardless of medical treatment, the other commission emphasised the patients right of self-determination. They recommended a validity of advance directives also for non-irreversible diseases.

Because of this still unsolved controversy, I will examine this debate and focus on the social reality of (the missing know-how of) dying and death. Thereby I will follow two questions:

1.How do the commissioners try to find legal solutions for situations no one really knows about?

2.What possible consequences can be deduced from this debate for our social practice and the way we're dealing with death and dying?

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"Intimate dialogue" as a paradigm for the end-of-life decision making?

"We want help you to manage the dying (…) we meet dying daily and differently, let us speak about your fears and wishes," that is how the Czech non governmental initiative

"dying.cz" describes its main goal. The specific grid of interaction that happens through an "intimate" information provider confirms the high emotionality of the end-of-life issues. It also shows the new crucial argument; respect for the intimacy of dying. Intimacy is defined as emotional awareness of the "innermost personal reality by the other" and becomes the core of the understanding of the issue by patients and public as well as the key for the medical decision. Thus, I will ask, how to integrate the "intimacy" as a paradigm of knowing, conceiving and deciding not only within the interpersonal level of the medical discourse but in the decision-making?

Until now, emotional awareness of the fears and hopes round end-of-life has been mostly successful in the media where the antagonism of "intimate" and "public" brings more a bias than a conceptual outcome. The paper therefore attempts to identify "the intimate dialogue"; a paradigm that allows an externalization of emotions as a skill for decision-making. Summarizing the recent discussions on the role of emotions within the interaction and communication in the political discourse on end-of-life, a case study about the initiative "dying.cz" of the Czech non-governmental organization "Homecoming" should investigate the collaboration between experts integrated in the decision making and the public.

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The return of the living-dead? Law, Medicine and Definitions of Death in the 20th century.

Developments in intensive care in the 20th century have contributed to blur the frontiers between life and death. Thus, for instance, a new category of patients appeared in the 1950s, the beyond coma patients. Their brain was diagnosed as dead –no trace of electric activity– and, although their respiratory and cardiac functions could be briefly prolonged with drugs and machines, imminent death was inevitable.

In the 1960s, developments in transplantation created a demand for vital organs. With some legal reforms beyond coma patients could be the solution. Rather than legalizing the exceptional extraction of their organs, legislators in different countries assimilated their state to death, and coined the category of brain death. Their organs could thereof be legitimately extracted, for the dead cannot be killed.

Developments in intensive care in the last decades have weakened the concept of brain death: new machines trace residual activity in the brain which was not traceable before, traditional death is no longer imminent after the diagnosis of brain death. At the socio-political level, one would have thought that the growing legitimacy of euthanasia would have contributed to weaken the need to declare those patients dead in order to use their organs.

It nonetheless seems that the legal and medical existence of the concept is assured in most countries –with yet some interesting exceptions– as it responds to a double

anthropological need: that of drawing neat lines between life and death, that of maintaining intact the taboo of not killing a person to save others.

Matt Wray
Harvard University

Interviewing the Dead: Suicide and the Psychological Autopsy

This paper consists of two parts. Part one traces the development of the psychological autopsy (PA) from its origins in early 20th century social science to the present day. One of the two primary sources of data on early PA that I use are a series of face-to-face interviews with Edwin Shneidman a founder of suicidology. Shneidman's work was in turn based on the pioneering work of Gregory Zilboorg, who headed the Committee for the Study of Suicide (1934-1940), established to explain a wave of police suicides in New York City. The archive of the collected papers of the Committee forms the second primary source of data on PA. In the late 20th and early 21st century, PA has become more systematic and formalized, with increasing emphasis on PA not only as a way to uncover and document psychosocial risk factors, but as an increasingly valid forensic method for investigating suspicious or equivocal deaths. The second part of the paper considers the limitations of both the historical and contemporary psychological autopsy as methods for illuminating risk factors and guiding suicide prevention efforts. An alternative method, the social autopsy (SA), is examined, with an emphasis on the multiple methods, both qualitative and quantitative, involved in conducting the SA. The SA, developed as a way to better understand disaster-related mortality, must be modified to fit suicide research. The paper ends with a consideration of the possibilities and implications of adopting SA as a substitute for PA in suicide research.

END

13.6 Engineering and Design:
Chair: Dean Nieusma
Papers by Christopher Neumaier, Massimo Mazzotti, Nicholas Knouf, Diego Llovet

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The 'Ideal' Engine for Automobiles. A Comparison of the Diesel Cars in Europe and the United States

Americans know that diesel-automobiles are smelly, dirty, noisy, sluggish, and unreliable. Hence, they perceive diesel engines to be inappropriate for automotive vehicles. In contrast, Europeans attribute diesel engines to be very economic, long-lasting, and environmentally sound. This difference has been developing over the last thirty years. It is portrayed in automotive magazines and by the number of newly registered vehicles per year; in the US diesel-cars have been marginal, whereas in Europe sales of diesels outnumbered those of gasoline powered cars in 2004.

The sociological theory of rationally constructs ("Rationalitaetsfiktionen"; cf. Uwe Schimank) has proven to be a helpful tool for explaining these two 'ways of knowing' how cars should be powered. They enable consumers to make normative assertions on how 'good' or 'bad' a car is. This is achieved by trivializing complexity threefold; temporally, factually and socially. Thus, they help users in the decision making by delivering a gain of time, by reducing uncertainty, and by endowing decisions with legitimacy. On this basis consumers are able to either opt for or oppose an automobile. For instance, a 'good' car accelerates quickly from rest to 60 mph, emits only few pollutants and achieves high fuel economy. Since technical properties of diesel automobiles and their functions, as well as environmental policy and fuel taxes have been different in Europe and the US, different 'ways of knowing' evolved.

To conclude, rationality constructs help to explain why US consumers know that automobiles ought to be powered by gasoline engines, whereas in Europe a paradigm shift occurred during the last 25 years.

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Producing Olivetti Style. Technology, Space, and Organization at Olivetti, 1945-60

Olivetti products in the 1950s were characterized by an exceptional attention to design. The term "Olivetti style" was soon coined to identify the distinctive design of Olivetti machines, which was based upon precise ergonomic and aesthetic principles. The message was clear: there was "another way" of typing and calculating, one best

symbolized by adverts in which flowers sprung out from Olivetti machines.

In this paper I explore the design and production process at Olivetti in the postwar period in the attempt to capture its broader cultural meaning. I shall try first to identify the key-meanings that were routinely attached to the notion of Olivetti style – a term that came to epitomize technological cool in the late 1950s. I shall then show how considerations about the stylishness of the products should be integrated with an understanding of the particular design and production process adopted by Olivetti. To this extent I shall focus upon images and footage of Olivetti machines and assembly lines. Focusing upon producing technologies in the factories - especially the use of space, the man-machine interaction, and the micro-organization of the assembly line - shall prove pivotal to enrich our understanding of the priority of design at Olivetti, and to bring to the surface its social and political dimension.

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Designing and Observing the Use of an Object with (Presumed) Agency

The developer of technology, once introduced to alternative ways of understanding the objects he or she creates, continually finds himself or herself living in the borderlands, uncomfortably straddling walls that are entirely too high. Yet this straining to see the situation from multiple vantage points is especially necessary when forming objects that (seem to) act on their own around humans: failure to acknowledge and understand the discourse of science and technology studies leads too quickly towards technological determinism with predictably unfortunate results. In this paper I will talk about my experiences as the designer of a new object with (presumed) agency named syngvan. This robotic creature is used to encourage, through its own movement, non-instrumental vocalizations in the user. The case of syngvan provides a probe through which I observe how someone's behavior can be changed by the actions of a robotic object in their home. Additionally, the process of the development of syngvan illustrates ways in which the results of STS research can be used not only as actionable items in technological design, but also as catalysts for conceptual change in the mind of the designer. Finally, my analysis of people's reactions to syngvan is an example of an observation methodology that, while unconventional and challenging to the traditional technologist, provides a richer view of in-situ interactions.

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A car for the drunk: alcohol ignition interlocks as collective representation of self-control

Having a driver's licence presumes the ability to exercise self-control, a standard used by drivers and the legal system to decide who shouldn't drive. Drunk drivers are an obvious target for exclusion from traffic, as their alcoholism robs them of their ability to moderate

themselves. However, governments have typically avoided barring them from the road altogether. Many North American jurisdictions have decided to "cure" drunk drivers by adopting a technology –alcohol ignition interlocks- that demands a "clean" breath sample from the motorist before they can start the engine. The device, not the person, ensures self-control, making traffic safe again. My paper analyzes this technology by formulating how interlocks mediate driving and produce challenges of interpretation and action that change the nature of urban traffic as an ethical milieu where strangers have to safely deal with each other. I explore the technical aspects of alcohol interlocks –their design and prescribed use- to reveal the moral subtext and tensions latent in this technology, which allows drunks to drive but forces them to resign their ethical skills as vehicle operators. The paper shows the cultural contradiction of interlocks: they are meant to sustain a liberal model of citizenship, one of individual self-control, but keep the individual from the practice of self-government. Alcohol interlocks show the paradox of automated citizenship in a liberal society and invite us to think about the normative order of traffic as a particular moment in our society's always ambivalent valuation of self-control as the cornerstone of social life.

Dean Nieusma (Rensselaer)

Design Activism: STS as an Intervention into Design Pedagogy and Practice

This paper investigates how technology design practices are impacted when designers come to "know" STS, or more precisely when they are systematically exposed to STS analyzes of the social-material world. It reviews pedagogical experimentation surrounding Rensselaer's interdisciplinary design program and connects it to key themes in STS, namely practicing STS as an intervention into technology design and the requisite knowledge dimensions of broadly interdisciplinary designers. Rensselaer's Product Design and Innovation (PDI) program was initiated in 1999 in an effort to integrate STS, engineering, and arts/architecture pedagogy under a single program. While students typically receive a dual-degree (one in a technical discipline and one in STS), the curriculum is built upon a foundation of interdisciplinary design studios, where social, technical, and aesthetic concerns are dealt with simultaneously. The PDI program has been successful in attracting and retaining students, but no systematic study has been done on the experience of faculty and students participating in the program or the strategies for and effectiveness of integrating STS insights into the students' design processes. Using semi-structured interviews with faculty and students and a review of compiled student feedback, this paper will provide a first-round evaluation of the program's success in integrating STS into design pedagogy. By identifying the methods deemed most successful in bringing the messages of STS to design, the paper will draw on traditional theoretical frameworks for understanding technology making (e.g., SCOT, and in particular Law's [1987] heterogeneous engineering and will extend efforts to theorize STS as intervention into technoscientific production processes (c.f., Woodhouse et al., 2002).

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13.7 Contextual Lenses for Ways of Knowing

Organizer/chair: Alice MacGillivray
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This panel includes four participants from Fielding Graduate University, who live in the U.S., Canada and Ireland, and who will present and engage in dialogue about contextualized ways of knowing. They suggest there are many legitimate ways of knowing, which they have explored in science and technology environments, using a range of methodologies including phenomenology and phenomenography. They also suggest that the effectiveness of ways of knowing varies in different contexts. Through their multidisciplinary engagement with context and diverse ways of knowing, they explore the implications and relevance of their work for other social studies of science.

Mike Ginn paints an overall landscape of contextualized ways of knowing by drawing on the work of Ken Wilber; he explores different ways of knowing in relation to the social studies of science, and a technology diffusion project. James T. Bogner looks ahead to ways of researching how members of horizontal groups in the healthcare field might make meaning in different contexts. Mary Connors and Alice MacGillivray look back on their empirical studies of teams and communities of practice working in virtual and face-to-face combinations. Mary focuses on the cultural backgrounds and intuitive insights of female virtual team leaders' ways of knowing. Alice looks at ways of knowing in four science-based counter-terrorism communities of practice, and relationships amongst ways of knowing, leadership and effectiveness.

The panel members reflect on their own work as well as cycles of learning from each others' research experiences.

Mike Ginn
Fielding Graduate University

A conceptual lens on ways of knowing: Ken Wilber's integral approach was created by comparing -- across cultures and historical eras

different ways of knowing. The resulting comprehensive map of human capacities allows for a more effective and "integrally informed" approach to a specific problems and solutions across a wide range of domains, including science, technology, business, education, and social change. This paper explores the broad implications of Wilber's work on ways of knowing to how science is conceived of and carried out. I emphasize Wilber's recent development of an integral methodological pluralism which can inform a conception of an integral social science. To illustrate pragmatic uses of Wilber's theory I also review an integrally-informed action research project for technology diffusion in a high-tech company.

James T. Bogner
Fielding Graduate University

Ways of knowing across large healthcare systems

Using systems principles, this unpublished paper provides a human and organizational systems view of a complex organizational system situated in the healthcare life sciences field. It has implications for the exploration of how imbedded horizontal groups might make meaning through their interaction with one another. In this case study, I explore one of the world's largest healthcare systems, which consists of multiple, imbedded sub-systems, each possessing its own high degree of complexity and each heavily engaged with information, society and knowledge-richness. A range of systems concepts and their intersections with meaning-making concepts are presented as applying to certain of the horizontal groups' ways of knowing. These intersections are explored in the context of information and knowledge creation, management and transfer. The study draws on literatures including complexity theory, knowledge management and communities of practice. This work may be of value to those interested in gaining deeper insights into lenses one might use to better understand how groups make meaning.

Mary Connors
Fielding Graduate University

Ways of knowing in virtual team leadership

Virtual teams often experience major problems, including communication disconnects and failure to accomplish agreed upon goals. This study explores female virtual team leaders' ways of knowing; specifically when their virtual team members need coaching, counselling or mentoring to clarify possible disconnects and to re-establish alignment for goal achievement. These leaders have created specific skill sets and ways of knowing that either integrate with technology or bypass technology altogether. This phenomenological study focuses on the specific leadership and communication competencies implemented by these effective team leaders. My findings support the variety of ways virtual leaders have of knowing; specific focus is placed on cultural background and intuitive insights. The main conclusions from this research support the creation and development of horizontal leadership and communication models to parallel technology advances. Technology is moving us to levels of synchronicity where time will cease to be a deterrent to real time leadership and communication.

Alice E. MacGillivray
Fielding Graduate University

Making Sense of the Unpredictable

This empirical study explored the nature of leadership in complex S&T environments. Canada's Chemical, Biological, Radiological, and Nuclear (CBRN) Research and Technology Initiative (CRTI) uses an operating model that is very unusual in

government. CRTI personnel refer to their initiative as a counter-terrorism network of communities [of practice]. The leader of each community works -- without positional authority -- with participants from many organizations and locations. This phenomenographic study revealed CRTI participants' qualitatively different ways of understanding aspects of their work environments, including boundaries. Ways of knowing were shaped by experience with bureaucracies, scientific innovation, and possibly epistemic cultures. Patterns in ways of knowing related to perceptions of effectiveness of their work; participants who were most positive about their individual and collective effectiveness understood their work environments as complex systems rather than as traditional government structures. This study has implications for other complex, boundary-spanning S&T work in trans-disciplinary fields such as counter-terrorism and global warming.

Each presenter is a mid-late career professional as well as a doctoral student. Collectively, they teach part time in over six post-secondary institutions and have presented in other conferences and forums around the world on topics including human and social aspects of work with medical technology, geographic information systems, software engineering and knowledge management.

END

13.8 Science and Public Health: Alan Richardson (Chair)
	Papers by Alan Richardson, Burcu Gorgulu, Sanem Guvenc-Salgirli

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"Mommy, are you going to die?": Individual Suffering and Public Responsibility in the Canadian SARS Commission Final Report, Spring of Fear

In the spring of 2003, 44 people in Ontario—almost all from the Toronto region—died from Severe Acute Respiratory Syndrome (SARS). Another 330 or so became acutely ill. In January 2007, the final report of the SARS Commission—mandated by the Ministry of Health and Long-term Care—was issued. It is entitled, Spring of Fear. It runs to over 1200 pages. As the title indicates, the report plays up the fear associated with the outbreak of a hitherto unknown virulent infectious disease. The genre of the report, in the first instance, seems to be tragedy. For the report claims that (17):

The public health system was broken, neglected, inadequate and dysfunctional. It was unprepared, fragmented, uncoordinated. It lacked adequate resources, was professionally impoverished and was generally incapable of fulfilling its mandate.

But when it asks, "Who was to blame?" (19), it returns the answer: "No one." More precisely, the Commission finds that no one in particular is to blame, but rather that (19): "This was a system failure. We were all part of it because we get the public health system and the hospital system we deserve."

This talk looks at the framing rhetoric of the SARS Commission Report. I am particularly interested in how the Report frames the issue in terms of individual fears and impersonal, although collective, responsibility. Connected with this is the way the Report marshals the notion of "politics"—finding, despite the claimed wide-spread public health failure, that there was no political "interference" during the SARS crisis—and the notion of "scientific certainty," which it argues must be set aside in times of crisis. The rhetorical stresses and strains of the Report indicate that a more sociologically-informed understanding of "politics" and the formation of "scientific certainty" would be useful in the realm of public policy.

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Brigette Nerlich, Prof. in University of Nottingham.

Risk and modernity: Bird flu in Turkey

Public understanding of health and illness is mediated by press coverage, at least for those who have access to the media. Media coverage of bird flu and the threat of a possible pandemic of human influenza increased rapidly after cases of bird flu were detected in Russia, Kazakhstan and then Turkey, where 12 people were infected by the bird flu virus through direct exposure and 4 died from the disease in January 2006. This study assesses the role of the mass media in constructing the public's understanding of the disease as a medical, social and economic problem in Turkey for the period between January 2006 and March 2006. The emergence of bird flu and its possible threat t the general population had certain characteristics that were influential in how the media and policy members reacted to it and which were different from other Asian and European countries where bird flu occurred. The way that risk from bird flu was framed had roots in Turkish culture, geography and migration patterns. A key feature of Turkish culture is a social consciousness built on the notion of "belated modernity". Turkey, as a gateway between east and west, has for many years tried to implement policies of modernisation which also came to influence the measures taken to reduce the risk of a major outbreak of bird flu. These measures were supposed to be based on scientific principles and reflect modernity. They were also imposed so as to make them acceptable to other countries that have already reached a level of modernity that Turkey still strives for. Another unique feature of the Turkish outbreak of bird flu was that it occurred in remote rural areas, but was brought right to the centre of modern urban life through migration patterns that had brought rural residence into proximity with major towns. What was unique was that many rural immigrants live in "gecekondu" or ghettos of prefabricated housing which came to be perceived as sites of contamination and brought the whole process of urba

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Translating health: Idioms of local population and propaganda of social hygiene during the interwar years in Turkey

Between 1932 and 1960, Turkish Language Association published a twelve-volume dictionary with 137.000 local idioms from villages and small towns of Turkey. The officials of the state statistics institute, students of anthropology and folklore, and demographers have first collected and then translated these vernacular expressions into a formal and scientific language. This paper is going to analyze the health section of the dictionary. Through this document, first of all it is going to point out the sharp contrast between two very different ways of knowing about the human body, and illnesses. Secondly, reading through the pages of this document, one is able to observe that those who prepared this dictionary paid attention to translating especially a few concepts: syphilis, gonorrhea, and epilepsy, physical and mental disorders. Fighting against these illnesses and disorders constituted the primary concern of the state elite during the interwar years in Turkey. They saw them, and the individuals who bore them as a threat against the health of the future generations of the country. Collecting the local idioms and using them in health propaganda, which took the shape of propaganda on social hygiene, was one way for the state elite to secure the future of the nation.

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13.9 Indigenous Knowledge : Wenda Bauchspies (chair)
    Papers by Wenda Bauchspies, Diane Rodgers, Marie Delorme, Jennifer Poudrier

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Surviving Knowledges and Survival Knowledges: Boundaries of Mistrust/Desire

Science's boundaries are being expanded by contact with "other" knowledge systems, indigenous knowledge and "invisible" knowledges. In this process social scientists, scientists and experts (both local and foreign) are negotiating, producing and (re)defining scientific and indigenous knowledge. Using my postcolonial research site of Hauté Guinée, West Africa and my ethnobotanical work with local experts and researchers I will explore the intersections of scientific/indigenous and local/foreign through the maintenance of "survival" knowledges that have been used by the community for generations. In addition I will address how local and foreign experts are working to ensure that indigenous knowledge survives amongst globalization forces that may threaten and/or appropriate it. Thus I will address what knowledge survives and is surviving.

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A Bee or Not A Bee: Indigenous Knowledge of Social Insects and Western Classification Schemes

Ethnobiological research on indigenous classification suggests that identification of social insects does not easily fit the standardized Western classification model. While IK is certainly not static or unadulterated by outside influence, it is clear that some cultures do not share Western assumptions of social insect classification. For some indigenous groups, social insects are not considered important enough to seriously classify; "non-social" insects take on more significant cultural meanings. Other indigenous groups may not even acknowledge a "social nature" for insects or some cultures may assign differing levels of importance to social insects, as in the example of the Kayapó tribe of Brazil (Posey 2002), emulating the perceived behavior of wasps, yet disregarding termites. Inter-cultural variation exists as well due to a multiplicity of vantage points from various social locations at any given time-period. What are the implications of this for IK research that compares social insect identification with the Western system of classification? When an informant doesn't specify a classification or deems an insect to be non-important, they are often forced to guess or choose a category. If indigenous groups do not place a species in a particular category that aligns to Western schema, these identifications are considered 'mistakes.' These are then contextualized with elaborate explanations of myths and worldviews in order to situate the 'mistakes' as having some alternative rationale. Understanding various ways of knowing means rethinking the idea

of "mistakes" in IK social insect classification. It requires exploring the situatedness of both IK and the Western model of social insect classification.

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Oral Ways of Expertise:
Evolution and Influence in Canadian Aboriginal Knowledge
Landmark Canadian legislative pronouncements, including the 1997 Supreme Court's decision in Delgamuukw v. British Columbia, have validated oral history as a legitimate mode for registering facts and accumulating knowledge across long sequences of time.

Canadian Aboriginal knowledge is an oral historical form that has passed through the generations, defining unique expert ways of knowing and linking the future with the past.

Today, Aboriginal expert knowledge is increasingly incorporated into the science of ecological resource management and medical research, and into mainstream culture and spirituality. The evolution and influence of Aboriginal expertise is also furthered by events aimed at enhancing human rights by activist movements; demographic changes such as access to education and a high youth population; and legislative reform.

But this articulation relies also upon specific mechanisms employed by members of the Aboriginal community themselves, as they seek to gain credibility, access systems of authority, and contribute to the epistemological discourse that influences political decision making.

This paper examines the intersection between Aboriginal knowledge — as an oral historical form of expertise by juridical sanction — and the mechanisms used by First Nations community members to legitimize this expertise outside formalistic legal rationality.

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Picturing the Margins: Exploring the Visual Terrain in Aboriginal Women's Health and Medicine

This paper explores the potential of visual knowledge (through photography) to act as a form of empowerment in the context of Aboriginal women's health and medicine. Where the contemporary visual terrain in biomedicine can make invisible, or distort the female Aboriginal body through a complex set of neo-colonial lenses, this work aims to reverse the colonial gaze by opening a new visual space where Aboriginal women reveal these distortions and appear themselves as empowered and knowledgeable. I draw from two community-based participatory photovoice projects in Saskatchewan Canada where

Aboriginal women use cameras to develop and display their knowledges of breast cancer, 'obesity' and the 'healthy body.' I describe how this visual space captures a complex imagery of resistance, empowerment, identity, strength, suffering, spirituality and community. I also describe how these pictures and knowledges have been seen in local health care policy. This work aims to create a window through which seemingly different ways of knowing can work together to create an empowering and inclusive image of Aboriginal women's bodies, health and healing.

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13.10 Nuclear Energy: Mark Elam (chair)
      Papers by Mark Elam (chair), Midori Aoyagi-Usui, Nick Pidgeon, Seong-Jun
      Kim

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Competing Rationalities in the Government of Sweden's High Level Nuclear Waste

Where other technological societies have failed, Sweden appears to have succeeded. The
nation already boasts two major nuclear waste facilities. Currently, efforts are being made
to site the jewel in the crown of Sweden's nuclear waste disposal system: a deep
geological repository for the nation's spent nuclear fuel. From the early 1970s Swedish
nuclear waste management has been problematized firstly as a matter of nuclear safety.
Initially, there was an intense struggle to win credibility for a deep disposal concept as
representing an 'absolutely safe' solution. This struggle was partially resolved in 1984
with initial government approval for the KBS-3 concept which has gone on to win
international recognition as something approaching best available technology for high-
level waste disposal. However, attempts to marry KBS-3 with the best available bedrock
in Sweden have given rise to widespread protests. Thus, after 1995 the emphasis has
shifted to winning legitimacy for its siting in a community already hosting nuclear
activities. As the siting process has become drawn out, nuclear waste management has
become increasingly entangled in new environmental legislation advancing the more all-
encompassing rationality of sustainable development. With the introduction of the new
Swedish Environmental Code in 1999 the fate of KBS-3 now rests on its safe passage
through an elaborate environmental impact assessment process. The underlying issue in
the paper is what happens when two rationalities of government collide? When
established nuclear safety experts are obliged to accommodate the new letter of
environmental law?

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Understanding climate change issue and nuclear power

Nuclear power generation is supposed to be "Clean" energy source, because it emits
almost no carbon dioxide. Climate scientists especially in the field of mitigation and
adaptation begin to talk about the nuclear power for reducing carbon dioxide to meet
Kyoto target, and future target now they begin discussing. Seeing those circumstances,
we carry out 1) nationally sampled public opinion survey, 2) group interview survey of
Tokyo metropolitan area, both about the climate change and nuclear power. Our results
show a) Many respondents have answered that there have been something wrong in the

weather recently, b) but, significant number of respondents oppose to build more nuclear power generating facilities, and prefer renewable energy, c)the main reason of opposing nuclear energy is distrust of power generating companies, and residuals from the nuclear plant.

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Nuclear Narratives

This paper reports the results of 35 qualitative interviews obtained in 2005 with members of local communities around a decommissioning nuclear power station in the UK. Taking an innovative narrative approach, we explore people's subject positions and values through the stories that they tell about living with nuclear risk. There is now a growing body of research in science and technology studies which seeks to recognise the central role that meaning and interpretation play in discourses and action around environmental risk issues. What unites many such studies is a concern to examine the circumstances under which risks come to be understood and acted upon by people in the contexts of their everyday lives. Accordingly, much of this work has also focused on the local contexts, or 'sense-of place', within which risks emerge. The work is also more broadly located in the methodological work on 'personal risk biographies' which draws on both narrative/biographical interviews and narrative analysis. We discuss the meanings and discourses that our participants deploy for living with nuclear risk, which include: processes of familiarisation/normalisation, tradeoffs between risk and both monetary and non-monetary benefits, and the emotional engagement or disengagement they achieve with the risk issue. The paper concludes with a discussion of the methodological usefulness of a biographical and narrative approach for understanding environmental controversies such as nuclear energy, and the significance of the results in relation to the emerging debate in many countries about the renewal of nuclear energy.

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Life of a 'Peaceful Atom' in a Peripheral Material Culture: the Case of Atomic Energy Research Institute (1959-1973) in South Korea

Recently, historians of nuclear science and engineering have increasingly turned their attention to the cases of non-US countries (Hecht 1998; de Mendoza 2005) and to their cooperation with the US (Krige 2006). The present study aims to contribute to this emerging stream of research by exploring the history of South Korea's first nuclear research institute – the Atomic Energy Research Institute (AERI).

In 1959, encouraged by the US-led "Atoms for Peace" initiative, and facilitated by the bilateral agreement with the US on "Civil Uses of Atomic Energy," the Korean government established the AERI under the Office of Atomic Energy. This paved the way for Korea's future success in advanced nuclear science and engineering. The trajectory of AERI, however, was not simply that of successful technology transfer from the center to the periphery. The two countries across the Pacific shared the prospect of civilian nuclear energy, but envisioned different paths of nuclear R&D at AERI. While American scientists and government officials wanted to support basic nuclear research, their Korean counterparts were more interested in building indigenous capability to develop nuclear reactors and fuel cycles. Despite the tension, Korea largely went its own way. In 1973, AERI merged with other nuclear-related research institutes to become the Korea Atomic Energy Research Institute (KAERI), with an even stronger emphasis on the development of nuclear reactors and fuel cycle facilities. Thus, rather than passively receiving technological assistance, Korea actively used the Atoms for Peace initiative as an opportunity to wage its own "Atoms for National Reconstruction."

END

13.11 Finance and Economics
    Alex Preda (chair)
    Papers by Ray-shyng Chou, Alex Preda, Turo-Kimmo Lehtonen, Neil Pollock

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Rationality and Economic Policy

This paper focuses on the notion of rationality and argues that economic rationality refers to different notions in different economic models. These different notions have their manifestation in economic policies. For example, the two kinds of policy, economic planning and laissez-faire, reflect whether we see economic rationality as societal coordination of economic activities or as individual economic calculation.

A set of literature in Science Studies contends that economic modeling has a consequence for the performance of an economy (e.g. Callon and Mackenzie). To further this idea, the notion of rationality helps fill the gap between economic models and economic practices. The theory of *cognitive tools* in Communication shows that different forms of human reasoning, which in turn influence behavior decision, are constituted by the use of different cognitive tools. An economic modeling, as a cognitive tool, implies specific forms of economic reasoning. A review on the debate between the *formalist* and the *substantivist* views of economics illustrates that different economic models assume various forms of economic reasoning. These two forms of rationality lead to two kinds of economic policy.

The formalist view, which is closely linked to neoclassical economics, takes economic rationality as a *universal*, *natural* force that determines human economic behavior. Its explanations of economic behavior mainly rely on the assumption of universal individual maximization of self-interests. On the other hand, the substantivist view contends that the performance of an economy is a result of societal coordination that is enabled and, at the same time, constrained by specific institutional conditions. Therefore, an individual's economic decision can not be determined independently. It always involves an individual's interaction with the situated social and natural conditions. According to substantivism, economic rationality refers to particular ways of economic reasoning that direct people's use of available natural resources and coordinate people's economic transactions.

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Global Electronic Markets, Technology, and the Cognitive Practices of Online Traders

Since the beginning of the new millennium, a series of technological developments have contributed to the emergence and rapid expansion of global electronic markets. The

explicit aim of their promoters is to attain global resource allocation in an electronic network, in which participants have instant access to all the network's nodes. Financial markets have been at the forefront of this evolution. Recently, global electronic markets have been characterized through increased product and trader integration: professional and non-professional traders can trade now the same products on the same electronic platform, which includes several markets. This raises the question of the ways in which technology shapes key aspects like price, volatility, or liquidity, among others. The examination of these issues cannot be separated from the analysis of how online traders use computer technologies, and how their use affects the traders' cognitive practices. Drawing on participant observation and interviews with traders and other financial actors, I examine practices related to price observation and discovery on electronic trading platforms, and discuss the impact of technology on financial knowledge, as well as the implications of global electronic markets.

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Insurance as a form of technology

In recent years, insurance has become one of the key topics in discussions concerning 'governmentality.' Within this Foucaultian tradition it is common to talk about insurance as a 'technology.' But as in many of Foucault's own texts, the concept of technology often seems to be taken as self-evident. In this context, my paper poses two questions: First, what is meant by 'technology' when this term is attached to social or private insurance? Second, what makes insurance specific as a technology? Obviously, scholars following Foucault would not think of a technology as neutral, as just a means to an end. Instead, in the Heideggerian vein a technology is viewed as something that both reveals the world and makes worldly objects conform to demands of productivity. While insurance as a money making tool can evidently be related to this perspective, there seems to be more to it. Other aspects that need to be discussed are: insurance as a 'technology of self' that affects the ways in which people experience the world but can also be active in it and mould it; the way in which insurance business generates new knowledge; how insurance is 'congealed action' (Latour) where the activities of the present moment are coordinated with the future effects they might have; and finally, how insurance affects the ways in which humans and non-humans can be merged (road safety, burglar alarms, medications etc).

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The Magic in the Magic Quadrant: Industry Analysts and their Tools

Michel Callon and his colleagues have written about an 'economy of qualities' in which the classification and positioning of things has become increasingly important (Callon et al, 2005). This is especially true for information and communication technologies (ICTs)

where properties are not readily ascertainable; and there is a lack of reliable knowledge about the capacity and behaviour of the vendors who produce them. We discuss this issue through investigating industry analysts and the role they play in ranking ICT vendors. In particular we investigate the 'Magic Quadrant' which is a classic two-by-two matrix of the kind much beloved by European and American business schools. Whilst it would be relatively easy to dismiss and debunk the Magic Quadrant, we argue that it has qualities not readily appreciated by social scientists interested in the relationship between technology and organisation. Among practitioners the Magic Quadrant attracts starkly opposing views: for some it is seen to have the power to make or break a technology; whilst for others it is simply a 'marketing tool', 'devoid of intrinsic value', and largely seen to be 'inaccurate' and 'incongruous'. In this latter aspect there has been much comment about the inadequacy of the tools two primary assessment criteria (a vendor's 'ability to execute' and 'completeness of vision'). Our aim in this paper is to open up the black box of industry analysis to understand and characterise the influence of these kinds of objects. We investigate them through exploring two sets of related issues and setting in train a particular line of inquiry. First we investigate the general nature of these tools and how they work. The typical sociological response to such devices might be to ignore the context of such tools and consider them as a 'convention' - something that becomes influential simply through diffusion and take-up (cf. Rip, 2006). We show the limitations of this view and offer an alternative. Second we discuss how the authors of the tool (the Gartner Group) go about producing the Magic Quadrant. It is the perhaps the very construction of these tool that is the most interesting (and somewhat contested) aspect. When producing these tools their authors construct a 'calculative network'. Analysts gather around themselves a small number of practitioners currently engaged in implementing vendor solutions who then feed back testimony. The position of vendors is partially produced from the working of, and interactions between these networks of practitioners and analysts. We describe the information fed back as 'community knowledge' to emphasise the fact that Gartner do not entirely make Magic Quadrants within the boundaries of their own organisation but instead rely upon this geographically dispersed network of actors. Finally, and this is the line of inquiry we wish to open up, through drawing on recent work in economic sociology and the sociology and anthropology of finance (Callon, 1998, 2007; MacKenzie, 2003, 2006) we show how the Magic Quadrant is what sociologist sometimes describe as 'performative' or 'constitutive'. It is not an object that is a simple description of the ICT marketplace but one that interacts with and changes its object of study. We show the ways in which the Magic Quadrant has altered views on the nature and practices of information system assessment: it is transformative in that it both problematises and sets out an alternative form of technology assessment; it remakes vendors in a more 'strategic' and 'comparative' guise; and it encourages actors (the subjects of the Magic Quadrant) to think and act in different ways. Our principal contention is that whilst the Magic Quadrant might once have been a fairly incongruous means to classify and position vendors this is no longer simply the case. Through a series of looping effects it has altered its domain of study such that it is now seen to be a more accurate description of the ICT marketplace.

END

14.1 Author Meets Critics: Charis Thompson

14.2 Gender and Race: Sandra Harding (chair),
    Papers by Sandra Harding, Jennie Olofsson, William Lewis, Andi Johnson,
    Regina Cochrane, Sharyn Clough

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Haunted Modernities and their Sciences: Challenges for Progressive Science and Technology Projects

How are modern sciences and technologies to be more tightly linked to social justice projects, including concerns about "difference"? This question has shaped important legacies of work on sciences in society throughout the last century. Political movements sought to develop sciences and technologies that could be specifically for poor people, women, the victims of racial and ethnic exploitation, oppression, and discrimination, and of imperial and colonial forms of such exploitation, Queers, and disabled peoples. That is, such sciences and technologies would not just be about such groups or authored by members of them. They would not just "include" such groups in their objects of study or their representatives in science studies institutions--important as these projects are. Rather, they would produce the kinds of knowledge about nature and social relations that such groups wanted and needed in order to flourish--indeed, even to survive the nasty, short, and brutish lives to which they are still today far too extensively assigned as part of the costs of so-called modernization.

The question has emerged with renewed vigor at the end of the Twentieth Century and now in the Twenty-First Century as the recognition spreads that while modern sciences and technologies certainly have provided great benefits to those global citizens who have been already well-positioned to generate and receive them, more generally they have tended to widen the gap between the "haves" and the "have nots." Moreover, it seems to be precisely their greatest successes which bear a significant responsibility for terrifying threats to the planet and all its inhabitants. Their admired rationality has been so narrowly conceived and so ill-equipped to recognize the world it would enlighten that it has achieved the status of an exemplar of irrationality in much recent analysis. Modern sciences and technologies and their philosophies exhibit underdeveloped rationality. Such well-known sc

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For the sake of love - the importance of being an amateur

There is nothing natural or given in men's passionate relationship with technology (Oldenziel 1999:10). My aim with this paper is to investigate the merits in Ruth

Oldenziels expression; men's love affair with technology (Oldenziel 1999:9; Kleif & Faulkner 2003:296). By scrutinizing the very pleasure and devotion, and in the enhancement the recognition of professionals and amateurs, I claim that Technology (as well as masculinity) is a narrative production of our own times (ibid 1999:190). Further, the relationship between men and technology is not strictly one-sided. It is indeed founded in power as well as in pleasure (Mellström 2003:19). Pleasure is, as Hacker suggests, also about dominance and control (Hacker 1989:8,47).

Looking upon Kleif´s and Faulkner's article (2003), women seem to be distanced from technological devices, looking upon their work strictly as a profession. Here, reflections also easily end, with men and women, neatly separated and cemented in their gender roles. To follow this dilemma further I nevertheless suggest a shifted focus. For how can amateurness be understood? The very word amateur comes from Latin were it translates to lover (1). Hence, depicting men's love affair with technology as a sign of amateurness and as acts for the sake of love is crucial in men's love affair with technology. I'm emphasizing the amateurizing of women, hoping that many of them, in this regard, never become professionals!

(1) I was introduced to the understanding of amateurs as lovers at a conference held at the UCI in August 2007. SECT, Seminar in Experimental Critical Theory discussed critical aspects of ICT.

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How We Know Race: The Limits and Promise of Scientific and Critical Theoretical Accounts of Race.

Recent genealogies of race have demonstrated that past understandings of race developed by the life and human sciences have been rife with ideological notions masquerading as empirically verified truth claims. It is therefore not a bad supposition that contemporary scientific research may also be compromised by prejudgments about race. To those who want to know what race really is, the relevant question then is: "How do we separate true knowledge about race from ideological notions so that we may obtain a clear understanding of race and its effects?" This is a vexing problem and, in its most general form, it is a conundrum that has been troubling scientists and philosophers of science since Hegel noticed that a culture's scientific conceptions mirror and reinforce its metaphysical and normative assumptions. It is not, however, a puzzle without solutions. Marxist inspired Critical Theory, for instance, has suggested that social, historical, and economic analysis can aid in this separation. While this paper seconds this suggestion, it also argues that there are limits to the power of such analyses. Specifically, it contends that, properly applied, critical theoretical analyses can point out where and how ideological notions compromise scientific conceptions of race. However, they cannot— as many philosophical analyses try to do—provide a true conception of race. Done well

though, theses analyses pave the way for a correct conception by reconfiguring the folk or social understanding of race and by inspiring additional scientific research.

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The Limits of Science: Kenyan Running Meets the Science of Human Performance

This paper explores the relationship between science and high-performance sport. Heart rate monitors, GPS units, space-tested fabrics, gel-like "fuel," and other equipment are marketed as crucial measuring devices and tools for athletes striving to become "faster, higher, stronger." And, of course, illicit performance-enhancing drugs and blood doping programs are available for those with the will and resources. But is a scientific way of understanding, and perhaps therefore manipulating, human performance crucial to success in elite sport? I compare the ways of knowing of experts of two kinds: those who know how to calculate things such as maximal oxygen uptake, exercise scientists, and those who know how to run unusually fast, Kenyan runners and their coaches. Data from fieldwork at exercise science laboratories and elite athlete training camps suggests that Kenyan runners and the scientists who study them employ two different, possibly incompatible, ways of evaluating performance: The scientists privilege absolute knowledge produced through precise, quantified measurements calibrated to individual athletes; the runners privilege relative, social knowledge acquired through participation in groups and produced through hierarchically-organized training and competitions. The runners' system of knowledge is effective—Kenyans win races and break records. Unlike the scientists' way of knowing, the runners' epistemology is not based on establishing limits to human potential.

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Note:

1. My title below was "abbreviated." The full title is: Rereading The Death of Nature: "Feminist" Science Historiography in a Populist Mode?

2. I am a faculty member at the University of Calgary where I teach in the Women's Studies and Science, Technology, and Society Programs.
Rereading The Death of Nature:
The enduring influence of Carolyn Merchant's The Death of Nature: Women, Ecology, and the Scientific Revolution has recently been celebrated in a twenty-five-year retrospective symposium on the work in Isis: Journal of History of Science in Society. The contributors to this symposium praise Merchant's work for, among other things, "challeng[ing] standard accounts of the Scientific Revolution by introducing feminist and environmental perspectives" and for "its contribution to feminist theory." A critical interrogation of the politics of knowing underlying Merchant's historiography, however,

calls these accounts into question.

Although Merchant aligns herself with feminism, environmentalism, and "utopian socialism," she adopts as the thesis of her book the claim that "[b]y critically reexamining history … we may begin to discover values associated with the pre-modern world that may be worthy of transformation and reintegration into today's and tomorrow's society" (p. xix). Given that the pre-modern world she evokes is built on the "communal organic societies" of agrarian communism, modeled on the peasant village community, and of "dialectical" millenarianism, this stance is actually much more in keeping with Romanticism and its heir, classical populism. Hence, the purpose of this paper will be to argue that Merchant's (undialectical) historiography of science is not feminist – or, rather, socialist feminist – and "ecological" but populist. The paper will also conclude with a brief examination how populist approaches to "knowing" about science, derived from Merchant's work, are currently lending support to problematic political projects like the post-developmentism of Indian physicist and subsistence ecofeminist, Vandana Shiva, and poststructuralist/poststructuralist-anarchist "anti-globalization" activism.

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Triangulation, social location and ophthamology: Do you see what I see?

Most feminist epistemologists have argued that while the social location of knowers is relevant to the knowledge produced, this relevance does not radically foreclose the possibility of sharing epistemological standards between those who are working from different social locations. We can all (more or less) successfully communicate with each other about basic features of our shared world, triangulating between the actions of others and the features of our world that give those actions their meaning. The possibility of this successful communication significantly weakens the charges of conceptual relativism that have been aimed at feminist science studies. Still, triangulation speaks only to the possibility of successful communication. There are many documented instances when the possibility of successful communication is not realised in practice. Gender differences, intertwined with differences in other social features, seem to matter, even, or especially, to producing, communicating and learning scientific knowledge. But how much do they matter? And in what circumstances?

My suspicion is that any answers to these questions will be highly specific to the scientific setting in question and that more empirical studies are needed to document the historical trajectories at work. I outline a preliminary study that focuses on a specific research setting, namely basic and clinical research on intraocular immune response. It is a research setting where, for a variety of reasons, basic triangulation is conceptually ambiguous and/or physically difficult, yet some objective constraints on interpretation can still be identified.

END

14.3 War and Weapons: Charles Zerner (chair),
        Papers by Hugh Gusterson, Benjamin Sims, Charles Zerner, Tyler Wall, Megan
        Glick, Gwen D'Arcangelis

Hugh Gusterson
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Can a weapon be immortal?

Joe Masco describes the U.S. nuclear weapons lab's current project as one of "nuclear
gerontology." In a situation where the labs cannot test new weapons designs, they are
preoccupied with the aging and death of their weapons, their weapons scientists, and of
the weapons labs themselves. What is the shelf-life of a weapon? Can it be refurbished
indefinitely? Is weapons design knowledge, often tacit, immortal or will it pass away
with its progenitors? Can the arts of design and experiment be separated so that new
weapons can be designed and built despite the test ban treaty? And can the geopolitical
order nuclear weapons regulated through the cold war be preserved in the face of nuclear
proliferation by upstart countries in the Third World?

At a moment when the life sciences are able to manipulate the codes of life with
unprecedented facility, promising brave new worlds of high crop yields, replaceable body
parts and extended lifespans, nuclear weapons scientists are preoccupied with decay: the
decay of plutonium, of their communal knowledge, and of the nonproliferation regime.
In a context where machinic evolution is problematic and decay is a persistent threat,
reliability -- the machinic version of immortality -- has emerged as the weapons
scientists' collective project, a project to forestall entropy.

Benjamin Sims

The design and production of nuclear weapons is fundamentally dependent on tacit
knowledge: that is, codified knowledge (such as what might be found in engineering
drawings) is necessary but not sufficient to enable production of a functioning nuclear
weapon. Donald Mackenzie and Graham Spinardi argued this point persuasively in their
1995 article "Tacit Knowledge and the Uninvention of Nuclear Weapons." In doing so,
they forwarded a view of tacit knowledge as a set of communal understandings tied to
particular communities of practice, such as designers, computer model developers, or
machinists. This view of tacit knowledge is common in the science and technology
studies literature. However, it gives insufficient attention to the transactional aspect of the
tacit knowledge involved in complex technological projects. Transactional knowledge is
that which is necessary to coordinate practice across multiple technical communities,
such that the knowledge of each community can effectively contribute to a larger
technological goal. One of the greatest challenges faced by the Manhattan project was
this coordination, which had never before been attempted on such a large scale, and led
directly to modern methods of program management. In contemporary U.S. nuclear
weapons design, there is a large corps of experts, primarily engineers, who are

specifically dedicated to working the boundaries between communities of practice. Based on a study of the work of these knowledge intermediaries, this paper revisits MacKenzie and Spinardi's conclusions about the problems involved in inventing and uninventing nuclear weapons.

Charles Zerner
Barbara B. and Bertram J. Cohn
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Stealth Nature: Reflections on Robotic Feral Dog Packs and Weaponized Insects in Landscapes of Toxicity and War

In March of 2006 the Defense Advanced Research Program Agency or DARPA published a 'presolicitation bid" for Hybrid Micro Electronic Mechanical Systems (HI-MEMS) which stated: "DARPA seeks innovative proposals to develop technology to create insect-cyborgs, possibly enabled by intimately integrating microsystems within insects, during their early stages of metamorphoses…Once these platforms are integrated, various microsystem payloads can be mounted on the platforms with the goal of controlling insect locomotion, sense local environment, and to scavenge power." These insect-machine hybrids are "insect dreams" - the aspirations of a military-security apparatus focused on generating remote forms of mobile surveillance devices that can see and sense, on the battlefield, with low probability that they (the insect-cyborgs) will be seen or sensed — the proverbial "fly on the wall." At the same time, environmental engineers are engaged in the politics of exposure and resistance by creating robots that can see and sense environmental dangers, including radiation and toxics -- the invisible hazards of the everyday environment.   In juxtaposing these parallel developments, this paper asks: What kinds of governance and powers over nature and within society do we wish to legitimize, empower, and enact? What states of nature do we dream of? What forms of nature will, ultimately, inhabit us? The existence of these insects as fantasy, and their possible materialization as military "vivisystems," in varying stages of development, provokes unsettling questions.

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"At the Tip of the Spear":Exploring Discourses in Response to a Military Base Closing

This paper explores the discursive constructions surrounding the governmental threat of closing one US military base located in the Midwestern US. This specific military assemblage deals in the research, development and acquisition of "warfighter" technologies for the US Navy, employs many local civilians including engineers and scientists, and is a major staple in the local and regional economy. The main question being explored here is: how is this techno-scientific military base and surrounding communities discursively constructed by media outlets, governmental actors, special

interest groups and the military base itself in the face of potentially being shut down? Particular attention is given to discourses of "national security" and "economic livelihood".

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Extraterrestriality and the Alien Body: Seeing the 'Human' in Cold War Technological Culture

This paper will consider the preponderance of UFO and alien "sightings" in post-WWII U.S. culture, and will do so in the context of the emergence of the field of exobiology (now astrobiology) and the rise of radiation experimentation following the detonation of the atomic bomb. Focusing on both lay and technical accounts of the alien body, this paper charts changes in understandings of extraterrestrial corporeality during the Cold War years for two purposes. First, it will consider the general cultural fascination with the alien body as a symptom of post-WWII racial melancholia. Second, it will consider the ways in which understandings of "alien" life came to inform understandings of human life in an era of nuclear technological advance.

Of central importance to this paper will therefore be a comparative visual analysis of wartime and extraterrestrial photographs and pictorials. Examining the physical and psychological impact of (post)modern industrial warfare, this paper will suggest the ways in which extraterrestrial "sightings" were a collective and delayed reaction to the onslaught of photographs of concentration camp victims and the "hibakusha" ("explosion-affected people") of Hiroshima and Nagasaki. Examining bodies at the limits of humanity, this paper will make use of trauma theorists' work on the role of photography within the individual and public consciousness. In accordance with the 2007 conference theme, this paper thus pits lay and technical systems of visual knowledge against one another in the interest of understanding what it means to be "human" under the shadow of dehumanizing technologies.

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Figuring the Microbe in Discourses on Terrorism and Disease

The discourse of "biological threat" has emerged over the past two decades in the U.S., and particularly since 2001. At the nexus of imperialist U.S. discourses on terrorism and disease, recent cultural productions of "biological threats" center on the figure of the microbe, materialized by either "bioterrorism" or "emerging infectious disease". In this talk I discuss how U.S. understandings of the microbe have changed in light of the recent overlap between national security and public health management and infrastructural response to the dangers that microbes present. Traditionally, while national security and

public health realms have much in common as they both purport to safeguard the welfare of the nation, they have been characterized by quite different threat foci (external vs. internal dangers) and management styles (aggressive response vs. preventive management). The overlap and interaction between these two realms are part of current shifts in discourses on terrorism and on disease, and serve, I argue, to naturalize terrorism on the one hand, and militarize disease prevention on the other. I focus on how the figure of the microbe is implicated in these developments, exploring the role that changing understandings of the microbe play.

END

14.4 Pharmaceuticals, Regulations, and Markets: EunJeong Ma (chair),
      Papers by EunJeong Ma, Carlos Novas, Joon-Ho Yu, Wen-Hua Kuo, Benin,
      Helen Kang

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Contested Drugs: The Herbal Medicine Controversy between Western Pharmacists and Oriental Physicians

In this paper I discuss the herbal medicine controversy between two medical professions in South Korea: Western pharmacists and Oriental physicians. On March 5, 1993 the Ministry of Health & Social Affairs (MoHSA) proclaimed an amendment to the Pharmaceutical Law and repealed a legislative clause governing the herbal medicine cabinet. No sooner had this news broken, than members of the Association of Korean Oriental Medicine (AKOM) went on strike in protest and argued that the legislation had symbolically restricted pharmacists' ability to dispense herbal medicines. Opposing the claims of the members of AKOM, the MOHSA and the Korean Pharmaceutical Association (KPA) held that pharmacists were entitled to dispense herbal medicines according to the contemporary Pharmaceutical Law, which stipulated that pharmacists had comprehensive rights to dispense "medicine". This led to another spate of discussions on what counted as "medicine", which became a contested ground between two epistemologies: Western versus "Oriental" medicine. The dispute was temporarily closed when the Korean government amended the Pharmaceutical law in which new regulatory drugs "Oriental pharmaceuticals" were prescribed with the creation of new occupation "Oriental pharmacists".

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Orphan Drugs, Pharmaceutical Markets and Contemporary Biopolitics

This paper explores Michel Foucault's writings on biopower and government to explore the connections between biopolitics and bioeconomics. It will be argued that Michel Foucault's analysis of biopolitics is useful for considering the types of relationships that figure between the government of populations and the government of economies. Using the example of the orphan drug problem which emerged in the late 1970s and early 1980s in the United States, the paper will consider the various ways in which the problem of developing drugs to treat rare diseases was made knowable to political authorities through a combination of congressional hearings, surveys, academic conferences, media reports, and patient group activism. The paper will then move on to consider some of the ways in which the successes and failures of orphan drug legislation is made knowable to political intervention and measured on a number of economic scales. Lastly, the paper will conclude by examining some of the contemporary biopolitical problems which

orphan drugs pose in terms of the high cost of a number of therapies developed under the auspices of this legislation. The emerging contours of this problem consists of reconciling providing expensive treatments for a small number of patients whilst still trying to meet the general healthcare needs of the population.

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Race-based Medicine, Justice, and Health Disparities: Explaining the Phenomenon of BiDil

FDA approval and subsequent marketing of the drug BiDil for treatment of heart failure in African Americans marks the public entry of the pharmaceutical industry into the uncharted terrain of race-based drugs. Deliberations among proponents, health advocates, and social scientists regarding this development reveal multiple ways of knowing "race" (i.e. through the lenses of statistics, economics, genetics, and the law) and show how the discourses of race, health disparities, and genetics are conflated and mobilized for various purposes. Critics of BiDil convincingly argue that these conflations depend on reifying biologically deterministic understandings of race and serve to commodify racial health disparities for profit. Conversely, many advocates of African-American health issues argue that BiDil is an important step toward reducing health care disparities even while rejecting a biological determinism. In this paper, I consider this conflict through the lens of justice and show how an expanded view of justice as distribution and recognition serves as a productive framework for understanding the social significance of BiDil. Although this view of justice helps explain why BiDil appears to be a remedy for claims of historic racial injustice in medicine, I argue that BiDil and related race-based drugs are insufficient for promoting justice in the realm of health disparities. For example, the pharmaceutical industry's instrumental use of race for profit runs counter to the transformative view of health as a human right.

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A Racial Science/Business? Putting Kampo in the Contecxt of Asian Regualtory Cutlure

Kampo is the general term for traditional medicine in Japan. It is usually considered an insignificant deviation of Chinese medical thoughts, or an Edo legacy that has waned and been replaced by synthetic pharmaceuticals. Yet, these statements fail to explain why kampo drugs still are welcomed and popular today, without the state's sanction. Some kampo drugs remain available in proscriptive repertory; meanwhile, in the over-the-counter

(OTC) drug market, where most products claim to have kampo components, the volume

of consumption is quite large.

Departing from a naïve cultural explanation that singles out Japan for its insistence on the uniqueness of its bodily composition, this paper tries to look at the role the state plays in shaping what STS literature calls "regulatory culture" and hope to achieve a historical understanding of kampo's regulation during the period of Japan's modernization. It will investigate what the Japanese state did in forming this medical tradition and what other traditions became without its support. Complicating our understanding that considers kampo as just a racial science or business, this study hopes to question the seemingly perfect marriage between the Japanese race and kampo, as well as science and business.

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'Sensational Science': Conflicts of Legitimacy and Morality in Performance Enhancement Drug Testing

For a few brief hours in the summer of 2006, the bombing volleys of Israel and Hezbollah were dropped as headline news from the online New York Times, replaced by word that Tour de France winner Floyd Landis had tested positive for "unnatural levels of testosterone." A subsequent parade of talking heads – doctors, "anti-doping experts," cyclists, and journalists – soon arrived on television and attempted to educate the public in the ways of epitestosterone-testosterone ratios, carbon-isotope tests, and "normal male functioning." Much of the information offered was conflicting and imprecise at best, incorrect at worst. This paper examines the competing interests, ethics, and spheres of legitimacy in the production and utilization of scientific knowledge in the realm of performance enhancement. Focusing specifically on the field of professional cycling, I examine controversies around the use of erythropoietin, or EPO, and testosterone among cyclists. Questions of legitimacy and power arise between three groups involved in performance-enhancement debates: the cyclists and their teams, who employ private scientists and doctors; multi-national governing agencies such as the World Anti-Doping Agency and the International Cycling Union, and their medical experts; and "independent" experts – medical and juridical – called in to adjudicate debates between the first two groups on grounds both scientific and legal. I argue that the inability to develop "effective" and widely accepted, or legitimate, tests to regulate performance enhancement arises from three tensions. First, methods of experimentation with, and the development of, performance enhancers among the communities of practice involving athletes and their specialized doctors exist "outside" the ethical and professional strictures of the mainstream scientific establishment, thereby providing a "competitive advantage" in the development of performance enhancers and masking agents prior to the moment of developing

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The Visual and Ways of Knowing: An analysis of pharmaceutical drug advertising

The objective of this paper is to explore the ways in which visual culture, visuality and ways of seeing have been theorized, and to build a methodological framework for my PhD dissertation, which is a discourse analysis of direct-to-physician HIV pharmaceutical drug advertising. The purpose of this paper is to identify approaches to the visual that depart from conventional methods of discourse analysis and content analysis. I begin with the assumption that the visual requires a different set of conceptual and methodological tools for reading and analyzing than are warranted by written text. Scholarly analysis of the visual are conducted and presented via written text as the standard narrative form. I argue that going beyond the content and context of the image and engaging with the indexical quality of the visual will provide interesting insights into how we may conceptualize "ways of knowing" in general. The paper will begin by teasing out the ways in which discussions in semiotics, advertising and historiography have attempted to grapple with the visual and ways of seeing/knowing. I will then take these approaches and examine how they may be taken up in an analysis of pharmaceutical advertising. If the visual is not simply a supplement or backdrop to written text in these advertisements, what role does it play the formation and communication of knowledge? How can one conceptualize the complex interplay of visual signs while simultaneously taking into account the characteristic of the advertising medium as a method of persuasion to encourage consumption?

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14.5 Information and Publics: Ramón Solórzano, Jr.(chair)
        Papers by Ramón Solórzano, Jr., Keith Guzik, Shoshana Magnet, Roar Høstaker,
        Pablo Boczkowski, Christina Dunbar-Hester

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Getting Humans?- Evaluating the "Selves" and the "Service" in Self-Service Phone
Support

IVR (interactive voice response) telephone systems increasingly function as a layer
automating company and consumer conversations (e.g. at call centers). Do ethnicity,
race, gender, able-bodiedness, and class factor into evaluations of design quality,
technical sophistication, technical competence, and service?

This paper examines the "Get Human" grassroots campaign. Led by technical designer
Paul English, it is "a consumer project to improve the quality of phone support in the
U.S." (www.gethuman.com). By analyzing the discourse surrounding the *multi-
lingual* aspect of the "bottom-up" GetHuman Standards effort, this paper intends to
illustrate how technical design standards, much like standards for language policy, are
embedded in social processes that in some ways reproduce, and in others challenge,
hierarchical aspects across technoscientific networks, associations, processes.

Data will be drawn from online sources and from that gathered in my own ongoing multi-
sited anthropological STS research (J. Dumit, S. Marcus E, Martin, M. Montoya, R.
Rapp) on "the Spanish Option in the U.S."

The paper will focus on the contrasting agendas of multilingual advocates and detractors.
In so doing, a monolithic view of the "establishment/consumerist binary," of what we
know as "quality design," and of the "public" in the public understanding of science, is
considerably complicated and channeled by differently positioned and privileged
technoscientific mediators.

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Mining Menace: Exploring the Use of Data Mining in the United States Government's
War on Terrorism

News media in the United States have recently publicized the existence of a secret
government program to monitor telephone communications in the country as well as the
cooperation of major telephone companies in supplying the government with call records.
As in wars past, the War on Terrorism would thus seem to be serving as occasion for

novel collaborations between government and industry, with the former relying on the latter for the development of a surveillance apparatus able to gather and analyze personal data. At the center of the controversial program is data mining—techniques for identifying patterns in large stores of data that corporations have used to generate profiles of consumers and credit card thieves. Set within its surveillance program, data mining would ostensibly allow the government to identify persons who threaten the country's security. The government's use of data mining raises questions concerning its encroachment upon civil liberties. However, as past law and society research has demonstrated, surveillance technologies seldom function in a unidimensional manner that simplistically bolsters those in positions of authority. Drawing upon both law and society research and science and technology studies (STS), and using data mining as a case study, this paper explores different lines of inquiry that could be pursued to more fully understand the role and repercussions of technology in the United States' War on Terrorism.

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Biometrics at the US-Canada Border

Traditionally understood as the "longest undefended border in the world," the boundary between the US and Canada has been an object of increasing scrutiny in post 9/11 security discourse. New technologies play a complex role in the process of uncovering the ideological and material edges of the US and Canada. Since 9/11, biometrics - the science of using biological information for the purposes of identification - has become a crucial tool in describing this boundary.

This presentation examines the ways that biometrics are represented by a nexus of border officials, industry representatives, and policymakers as a communications technology able to make the post 9/11 Canada-US border newly visible. I argue that using biometrics to make evident the US-Canada border depends upon practices of inscription, reading, and interpretation that are assumed to be transparent and self evident and yet remain complex, ambiguous, and inherently problematic.

Noting that biometric technologies become newly present at this dividing line as the border between the US and Canada itself comes into focus in bi-national discourses, I demonstrate that in making the boundary newly detectable, the discursive representation of biometric technologies transforms this boundary. I suggest that using biometrics technologies to communicate the border serves to re-imagine the US-Canada boundary in ways that make it increasingly porous to certain travelers while it remains impermeable to others – a process that is intersected with the class, race and gender identities of individual bodies.

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The potential of new technologies – the case of RFID

Radio-frequency identification (RFID) is a technology that has entered into many new applications in recent years. The reduced size of microchips, the proliferation of IT-networks, better antennae and scanners, and, not the least, the introduction of the Electronic Product Code (EPC) has made RFID into a burgeoning industry. The application of RFID within areas like logistics, retail, security, law enforcement, and medicine is on its early stages, but has attracted great interest both among critics and proponents. The controversies have concentrated around the possibilities for surveillance by the use of RFID. On both sides it is possible to talk about a kind of 'potentiality writing' where the different parties write into the future either of great or small social changes, and these changes may be either for the good or for the bad. Taking its theoretical cues from the Social Construction of Technology (SCOT) and actor-network-theory (ANT) the paper wants to address how the different 'potentiality writers' may lead the development of this technology in different directions. Going beyond this framework the paper will try to show how the 'potentiality writers' extend and enhance already established social patterns for their differing futures and the technology itself will be examined for clues to the change of patterns in human affairs it may lead to. Within SCOT and ANT the latter step may sound like mixing up explanandum and explanans, but the paper will argue that this in not necessarily so.

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Information Transparency: Materiality and Mimicry in the Journalistic Field and Beyond

Mimicry is a power force in social life, evident anywhere from learning to talk to running a government. Mimetic behavior is partly dependent on being able to know what relevant others do. However, social settings have varying degrees of opacity, thus acquiring that information is not always a trivial matter—as the intricacies of a wide range of practices, from everyday gossip to industrial espionage, shows. Moreover, sometimes knowing occurs in an unmediated fashion, but most often it happens in the context of a material culture of information populated with objects such as books, films and computer networks. But exactly is the connection between materiality and mimicry? In this paper I will look at how a series of technological transformations that have made the entire journalistic field more transparent for any news organization have then been tied to a significant increase in imitation processes in editorial work and in homogeneity of news content across the media landscape. Based on a project that combines three years of ethnographic studies of news production and consumption with in depth content analyses of news stories, I will examine the dynamics and consequences of the links between materiality and mimicry in the journalistic field, elaborate on the particularities of this case for more general theory development, and reflect on its broader societal implications for the understanding character of the public sphere in contemporary democracies.

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"Radio for Whom?" Theorizing Media Activism as Social Construction of Technology

This paper uses the empirical site of contemporary activism around low power FM radio in the United States to scrutinize some themes in the social construction of technology. The fact that FM radio technology's meaning and use have been largely stabilized for over seventy years, but have in recent years been subject to contestation and policy disputes, makes this a site of particular interest. Firstly, the challenge by activists to redefine the appropriate ownership structure and use of FM radio (emphasizing the utility of radio as a tool for democratic participation, with local ownership and non-commercial content) present a differing case from the notion that interpretive flexibility is strongly limited after the technical artifact achieves closure. Secondly, as STS has concerned itself with the category of the user, communication technologies are perhaps of singular significance because they complicate the notion of the user by the introduction of "content" in addition to the artifact itself. In this instance, it could alternately be argued that "the user" is the listener, the programmer, or the entity who has the right to broadcast; the activists are perhaps mediators who claim to speak for each of these types of users, as well as being users themselves whose analytical significance may be that they resist the dominant interpretation of FM radio. The paper draws on historical and ethnographic research, focusing on the period from 1996-2006, to examine the efforts by activists to change the Federal Communication Commission's policies regarding the granting of FM radio licenses to community groups.

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14.6 STS in Development and on Location: Data, Products, Practice

Organizer/chair: Park Doing
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No panel abstract.

Park Doing
Cornell University
Dept. of Science and Technology Studies, Bovay Program in Ethics of Engineering

When it Rains it Doesn't Pour, but Whose Fault is it? And What is it?
Performances of Epistemology and Accountability in a US Backed Water System Project in Honduras

Technological interventions that promote social justice and protect the environment are promoted by engineering colleges and engineering societies as evidence of enlightened, ethical, engineering practice. I am currently following, as a practitioner and observer, a waterworks project in Honduras that is sponsored by a United States rural water association in conjunction with a Honduran agency and Cornell University engineering professors and students. Analysis of claims of what the project is, what it does, and how that is known as put forth in the course of this project is instructive for considerations of ethical interventions with regard to STS and engineering. Pressing on the concept of intervention, this papers explores how epistemological performances counter to those usually asserted by STS practitioners can be put to use in ways that resist disenfranchisement in a development context, and vice versa.

Richard Rottenburg
Martin-Luther-University, Cornell S&TS Dept.

Rule-Following, Technologies and Data Base Construction in a Development Project in Tanzania

In this paper I focus on the role of specific technical tasks, such as mapping and generating data, which rely on technologies of inscription and representation in order to produce facts that are crucial to the day-to-day management of organizations in the context of development projects in Tanzania. These technical tasks are part of a larger system of rule-following usually analyzed under the concept of bureaucracy. In the field of development the technologies supporting bureaucratic rule-following travel easily while the cultural implications of these technologies don't. Translating technologies of inscription and representation is therefore an important task which is often underestimated.

Luciana Pereira, Guilherme Ary Plonski
University of Sao Paulo, Polytechnic School, Production Engineering Dept

Brazilian Photonics: Negotiations over Local Knowledge in a Commercial
Technological Context in Brazil

This paper follows a group of Brazilian photonics companies that are applying local
knowledge to create technologically intense products and/or processes. The paper will
address how portrayals of knowledge as local are put to use successfully or
unsuccessfully in the context of commercial technical build up.

Luisa Massarani, Museum of Life, Oswaldo Cruz Foundation
Ildeu Moreira, Federal University of Rio de Janeiro and Brazilian Ministry of Science

Brazilian Understanding: Public Communication of Science in Brazil

This paper looks at public communication of science in Brazil, aiming at to
map out the main challenges and obstacles of the increasing dialogue between
science and public in this country. It will be also discuss the new public
policies designed in the last few years and their impact on Brazilian science
communication.

Victor Marquez
STS Cornell University

Airside / Landside: The Monterrey International Airport

How influential can STS thinking be in the shaping of technologies? As I would like to
present in this paper there are an interesting number of strategies that have had practical
applications in the gestating process of a new airport. STS is offering tools for alternative
analysis, new angles and broader perspectives generally supported on its characteristic
academic rigor. Yet these tools can be put to use by the practitioners themselves toward
different ends in practice. In this paper, I discuss here the struggle of conceptions of
technological determinism and the social construction of technology in defining
technology transfer and its adaptation in a Latin American case study: The new
Terminals at the Monterrey International Airport in Mexico. In this regard, I am
particularly interested in how the Landside / Airside is established in the creation of new
airport facilities.

Jenna Burrell
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Collectively Producing the Internet in Accra, Ghana

Cross-cultural STS research has played an important role in reintroducing notions of value, belief, and tradition to our understanding of the many roles computing technologies fill in various societies. In this presentation I will challenge the tendency in cultural accounts to treat social/symbolic aspects of technology as opposed to the functional/material arguing instead that the two are intimately connected. Evidence is drawn from an 8-month period of ethnographic research on Internet café use in Accra, Ghana. Internet café users framed and foregrounded certain functions from the technology's broad range of possibilities through story-telling, youthful group play, and religious ritual. Through symbolic 'uses' of the technology that often took place away from the computer interface, in church sermons, school yards, and other social settings, users re-produced and re-territorialized the Internet transforming it into something of local relevance. The Internet that emerged in Accra was centrally a communication tool valued for facilitating contact with foreigners and diasporic networks, for building social capital, and calling in support, gifts, and remittances. Other functions, such as impersonal information searching and publishing disappeared from this framing. This process fundamentally structured the actions taken by users at the computer interface. The articulation by users of the material capabilities of the Internet with their own cultural resources resulted in a distinctive and localized techno-culture. This necessary localization contradicts development institutional processes such as the UN-sponsored World Summit on the Information Society that treat technology as having a universally agreed upon utility to societies in the developing world.

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14.7 Health-Care, Knowledge, and Ethics
     Raphael Sassower (chair)
     Papers by Raphael Sassower, Rose Geransar, Hedgecoe Ole, Andreas Brekke,
     Paola Raska, Maximilian Fochler

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Medical Knowledge: Art, Science, and Ethics

It may be common knowledge by now that medicine combines art and science to the extent that medical pronouncements (diagnoses and prognoses) are bound to be less certain than is expected of advanced scientific discourses. What is less studied is the fact that most of our ethical dilemmas and controversies in the health care arena are bound by and based on fundamental uncertainties in what we know about medical data. In short, medical epistemology informs medical ethics. When we have a better appreciation of the limits of our medical knowledge (and of knowledge in general) we would be better equipped to deal with practical problems.

My strategy here (as in a longer, book-length version) is to highlight some of the issues faced by patients and health care professionals in a postmodern culture as a way to revisit the historical and philosophical debates that have perennially been cross-cultural. Concerns with the efficacy of scientific knowledge in general and some drugs and procedures in particular are symptomatic of deeper and more substantial concerns over scientific and therefore medical epistemology. There are concerns about how medical knowledge is established (scientific validity) and how medical protocols are administered (checks and balances), how medical certainty is evaluated (probability) and medical responsibility is framed (personal or collective), and how medical knowledge is transmitted (popular media versus professional journals) and medical care is allocated (insurance policies and government subsidies).

In general, I attempt to address the present predicaments of medicine, such as the status of medical knowledge and medical certainty, within a broad cultural context that exposes the expectations individuals have of their health care providers, health care institutions, and of themselves. I explore some of the historical roots of these concerns and suggest that rational discourse and parochial ethical dialogue may be futile in the face of competing and incommensurable frameworks and agendas, attitudes and wishes. Instead of focusing on public debates and highlighting the respective perspectives from which the protagonists frame their positions, I focus on the epistemological issues that might offer more useful insights and answers to the questions that are raised at the public-debates level.

When we speak of the relation between epistemology and ethics in the area of bioethics, we speak of certain constellations of data that inform each other and that allow us to learn more about our health and well-being. When we speak of *integrative bioethics*, then, we speak of certain information loops that help change our views of the underlying causes of our ailments, for example, or that allow alternative treatments to be

considered as part of the mainstream of medical practice. Every facet of our health provision becomes a contributing factor that enriches our understanding and that challenges us to account for the diverse and emerging properties of our bodies.

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'Experiential autonomy' and the postmodernist twist on informed consent: The case of umbilical cord blood banking

Human umbilical cord blood has attracted worldwide interest in recent years due to the discovery that it is a rich source of hematopoietic progenitor cells. Many cord blood banks have been established internationally to harness the potential of cord blood in both research and therapy. Canada is currently taking steps to develop a national public cord blood bank, a project that may utilize both federal funds as well as Canada's existing public and private cord blood banking capacity. The notion of informed consent is central to the collection, storage and use of cord blood, and at the heart of it lies the sometimes-elusive concept of autonomy. Expansion of cord blood banking practices at the federal level requires re-examination of the concept of consent and how it is sought using the varied protocols currently in place in cord blood banks. Recent literature in consent in tissue banking has reflected a shift towards a donor-centric approach, which necessitate an understanding of donors' perspectives and the multiple ways in which autonomy can be experienced in any given context. This paper explores different theories of autonomy and postmodernist influences on the consent process, and provides 'experiential' accounts of autonomy through the narratives of parents who have donated their child's cord blood.

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Research Ethics Committees and the politics of Trust

Over the past few years criticisms have been levelled at Research Ethics Committees (RECs – roughly the UK equivalent of IRBs) that they stifle research, presenting an unnecessary layer of regulation, or that they are a version of 'audit culture' applied to clinical research. Based on an ethnography of three RECs and drawing on concepts from the history of science, specifically the work of Steve Shapin and Harry Marks, this paper argues that RECs should be seen as 'political technologies of trust', organisations whose role is to assess the trustworthiness of medical researchers both as scientists and as fellow members of society, and in the process demonstrate to the wider community the value and safety of medical research. Such a view explains a number of features of REC practice, such as the limited requirements for reporting once research has begun, that do not fit with 'regulatory' or 'audit' models.

This paper explores a number of ways in which RECs assess applicants' trustworthiness as they draw on local knowledge of applicants' skills and work load, applicants' demeanor and attitude towards the committee when they attend meetings and answer questions on their research, and apply clinical expertise and lay-members' experience to applications.

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The Meaning of Life - Religious discourse in the science and politics of human biotechnology

Globally there has been a vitalization and strengthening of the religious dimension during the last decades, world religions have gained a new momentum and are attracting new followers on a global scale. This revival of religion also includes a reconfiguration and restructuring of religious space and its relations to other dimensions in culture and society.

One area where religious discourse has gained a particular stronghold is in the science and politics of modern biotechnology. In the modernisation literature, science is often thought of as the globalising and modernising force par excellence, while religion is seen as a local and tradition-centred phenomenon, bound to wither away under the pressures of modernisation. However, this equation of modernization with rationalisation and disenchantment is fundamentally challenged both by religious revival and by the developing new technologies of life. Human biotechnology moves right into the centre of the above process because of its affinity both to severe diseases and the non-instrumental aspects of life. The problematic of de- and re-enchantment acquires a particularly sharp form, producing many heated controversies, within this field. But the division may not at all be clear-cut. The discourse of hope both accompanying and driving developments within human biotechnology, may be seen as a secular variant of Christian salvational beliefs, promising a medical heaven - not in the hereafter, but on this earth, and not in a millennial perspective, but within ten-twenty years. In this paper, we investigate how religious meaning-dimensions are forming and being formed by developments in human biotechnology.

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Questioning of factual claims in science: healthy skepticism or harmful rhetoric in disguise?

The power of the institution of science and its knowledge construction on society makes a continuous oversight and analysis of the ethical and social implications of its research and constructs a necessity. Once potential social harms are perceived to inevitably flow from a particular line of research though, some take their argumentation and analysis a step further in an attempt to counter those potential harms. Often, the approach taken is to question the validity of research methods and findings as a means to undermine their power. This paper takes a close look at what ultimately results in an ideologically driven questioning of factual claims in science. What assumptions regarding the nature of knowledge underlie this approach and what are their long term implications? Is there an assumption regarding the existence of objective knowledge? If there is, what is assumed regarding knowledge and its bearing on moral value and decision making? Using the context of the debate over the race construct in biomedical research, I will explore these questions and I will demonstrate how the assumptions shown to underlie this approach permeate social science discourse manifesting themselves in arguments that are posed as scientific but are in actuality rhetorical in nature. I will argue that it is ineffective in that it fails to convince the scientists who are carrying out the research and who see the rhetoric as scientifically unsound and I will delineate the unforeseen harms that come of it to both science and society. Finally, I will propose a more effective and benign alternative to be the outlining of ethical imperatives to constitute a moral beacon independent of scientific factual claims.

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Living Changes in the Life Sciences in the Austrian Context. Tracing the "Ethical" and the "Social" in Scientific Practice and Work Culture

The life sciences are characterized by rapid innovation with regard to methods applied and knowledge produced. Economic, social and legal boundary conditions play a considerable role in their development. Further, they are debated in the public sphere as a central supplier of models of life, health and illness, followed both with admiration but also suspicion. Thus, they are often cited as a prime example for the new co-evolutionary relations between science and society.

While much ELSI and STS research focuses on the societal impact of life sciences, on the way research is/should be regulated as well as on the ethical issues it raises, far less attention is given to the impact the above mentioned phenomena have on scientific work

and knowledge itself. Our starting hypothesis is that ethical and societal considerations gradually reshape the culture and practice of research in the life sciences. To identify and better understand the qualitative changes these boundary conditions induce for research culture and knowledge production, and to grasp in which ways "society" is present within the life sciences is the central aim of the project this presentation is based on.

Building on biographical interviews with life science researchers we investigate the implications of e.g. changing work environments and career perspectives, higher competition for funds as well as the growing need to consider the social and ethical implications of one's own work. In our presentation we will report first results and hypothesis on the impact these issues have on research work in the life sciences

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14.8 Legal and Criminal Justice Dimensions of Science and Technology: Deborah White (chair)

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Rape kits, medico-legal expertise and the criminal justice system: Examining the institutional mediation of raped women's experiences within evidentiary processes

The criminal justice system response to rape generates a variety of sites through which medical, scientific and judicial practices, technologies and discourses merge, often dissonantly, to frame women's articulations of their experiences in particular ways. While the relative power and authority among these 'credible' forms of expert knowledge shifts depending upon circumstances, in the pursuit of legal truth, the subordination of women's narratives is constant. In this presentation, I examine one prevalent institutional response to sexual assault. Several decades ago, a standardized medico-legal protocol, known commonly as a 'rape kit', was widely introduced with the support of many feminist groups. Rape kits were to be administered to sexually assaulted women by medical professionals for the purpose of collecting corroborative evidence, the findings of which were to be processed by forensic scientists for possible use in courts. It was believed that better quality evidence would improve dismally low rape convictions rates. I argue that despite its ostensible intent to help women obtain justice, their knowledge of violence/violation is mediated and often re-shaped through the operationalization of this medico-legal tool. Further, the biases inherent in the design of rape kits that reflect anti-woman 'rape myths', in confluence with the cultural contexts in which they are engaged, have rendered this tool largely ineffective with respect to its stated purpose. Finally, I suggest that this institutional response ultimately reifies the hegemonic individualization and de-contextualization of rape, eclipsing recognition of the need and possibilities for responses based on women's collective knowledge and experiences.

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Modeling Justice: Inventing and Implementing the "Criminal Justice System"

The 1967 President's Commission on Law Enforcement and Administration of Justice is a defining moment in the organization of criminal justice practice and criminological science in the United States. Through a series of Task Force Reports, publicly circulated through the popular paperback, The Challenge of Crime in a Free Society, the President's Commission sought to rationalize criminal justice practice, in particular through the creation of federal institutions to fund criminal justice research and establish educational programs. Though rarely recognized, the President's Commission was also responsible for first approaching criminal justice practice as a system using emerging technologies of

systems analysis. Contracting with a defense advisory group, the Institute for Defense Analysis, the Science and Technology Task Force set out to model the various components of criminal justice practice as a coherent and efficient "system" in which all elements were oriented towards the common task of crime control. Their models were adapted into material technologies that were introduced into criminal justice environments in an effort to transform organizational practices, professionalize workers, and collect data for a fuller understanding of the criminal justice process. Thus the system, modeled as a present-day reality, was simultaneously being created and implemented. In this study, on the fortieth anniversary of the President's Commission, I investigate the models and activities of the Science and Technology Task Force, exploring the processes by which their models shaped the perception of a "criminal justice system" and raising questions about the relationship between politics, science, and justice.

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"The Bland Examination" - The construction of forensic medical evidence in cases of sexual assault

Increasingly, guidelines dominate medical and scientific work; nowhere is this more clear than in forensic work. Concerns regarding chains of evidence, objectivity, and legitimacy require that standardised protocols are in place to ensure that complainants and suspects are both examined with the same degree of scrutiny. Forensic medical practice, however, is not reducible to strict algorithms and the Forensic Medical Examiner (FME) finds herself caught between the competing pressure of conducting a thorough investigation and the therapeutic needs of the complainant. This often leads the FME to make determinations regarding the 'correct' practice based on her experience, which often entails moving away from the letter of the prescribed guidelines. Taking this situation as a starting point, this paper explores the negotiations that take place between the FME, professional guidelines, the police, and other prosecution agencies, in their attempt to construct evidence suitable for presentation in court. To illustrate this issue in some detail, I will focus upon the 'bland examination'; an examination in which no obvious signs of injury are present, and will consider the responses to such under-determined evidence by the FME and police in order to highlight the role played by expertise in the construction of forensic medical evidence.

Julie Cohen
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n/a

Cyborg Bodies, Autonomic Technologies, and the Law of "Unauthorized Access"

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The paper will explore the mismatch between the ways in which networked
information technologies construct embodied space and the legal
doctrines that regulate "unauthorized access" to those technologies.
The term "autonomic technologies" is a play on Winner's (1977) book,
"Autonomous Technology," which identified a tendency among policymakers
to conceptualize technology as autonomous and single-trajectoried.  To
the extent that autonomy presupposes separateness and singularity, that
account requires modification.  Information and communication
technologies increasingly are experienced as extensions of the
autonomic
nervous system, mediating flows of information automatically and
involuntarily.  The emerging science of ubiquitous computing seeks to
achieve "unremarkable computing": a seamless web of information and
communication tools that users experience as natural, if indeed they
pause to think about it at all.  The field of digital rights management
aspires to comparable seamlessness of access to media content within
individual "personal digital networks."  Yet the shift to autonomic
technologies works at cross purposes with the choice that Haraway
(1991)
posits between an "informatics of domination" and an informatics of
resistance.  More generally, it works at cross purposes with what one
might call the informatics of everyday practice, which is characterized
by continual repurposing and recreation of tools and places.  For the
most part, the law's relationship to these issues is one of
nonrecognition.  Facially, laws governing information rights are
preoccupied with a completely different set of issues, which relate
primarily to the terms on which competitors may gain access to digital
intellectual property.  Yet the law's inability to draw firm lines
between lawful reverse engineering and unlawful breaking and entry, and
between lawful and unlawful disclosures of technical information, hints
at a profound anxiety lurking beneath the rational, highly
professionalized discourse about interoperability and anticircumvention
protection.  (This paper is a draft chapter of a book under contract to
Yale University Press, tentatively titled "The Networked Self:
Copyright, Privacy, and the Production of Networked Space.")
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The Epic, Antipodal Battles on the Internet and the Limits of Liberal Tolerance

In this paper I visit a set of legal cases from the mid-1990s, humorously referred to as the "Internet vs Scientology", as a means to interrogate how a clash between hackers and Scientologists over cultural values led to some of the earliest known discussions and cases related to the emergent fields of Internet law and newsgroup governance (including remailers, the applicability of copyright to the Internet, the scope of subpoena power, the scope of defamation law on-line, newsgroup creation governance, and free speech rights). I not only examine how and why hackers became engaged in legal skirmishes with the Church of Scientology, but also demonstrate how these two groups stand in antipodal cultural relation with their: treatment of knowledge, science fiction, social organization, and views of freedom. In so doing, I use these legal case, and the examples of these antipodal cultural relations, to conclude with a discussion on the limits of liberal

tolerance, especially as it pertains to the right for various cultural groups to co-exist in shared public spaces, such as those of the Internet.

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Random Digit Darling: Threats, Science, Surveys and Silence

This paper explores the strange career of telephone surveys as a means for conducting social scientific research into the prevalence and nature of 'obscene and threatening' telephone calls. Though more generally known for their heavy breathing, 'obscene' callers frequently impersonated social scientists conducting 'telephone surveys' on intimate relationships and sexual practices. In the case study on which this paper will focus, social scientists make use of ('scientific') random digit dialing techniques to conduct research on women receiving ('non-scientific') random calls from men often pretending to be social scientists. This case study will be used to theorize scientific telephone surveys more generally and to raise questions of proximity between science and obscenity.

END

14.9 Health, Markets, and Governance
        Chair: Craig Willse
        Presenters: Sarah Kaplan, Teun Zuiderent-Jerak, Sonja Jerak-Zuiderent, Craig
Willse, Lisa Gugglberger, Benedicte Champenois Rousseau

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On the distributed governance of "my health state": doctor-patient relations in the age of
the Internet

Over the past decade numerous studies on the Internet and the medical field have focused
on the potential of this technology to change the role of doctors and patients as well as
their relationship. Issues of patients' empowerment through increased information have
been raised; difficulties and limits of partly too idealised visions have been pointed out.

In this presentation we would like to offer an analysis of the narratives patients construct
about the governance of their health state between the Internet, everyday experiences and
social relations to their doctor. We will show that framing and handling their health state
is a fragmented and distributed activity, with a repeated struggle to find a balance in a
network of relations. Thus different forms of knowledge enter the stage, the own health
state appears as a mutable "object", and multiple relations of credibility and trust in
different forms of actants (web-spaces, doctors,…) emerge. This does not lead to a simple
form of patients' empowerment, but to a more or less continuous reconsideration of the
basic tenets of any form of self-governance.

The data building the basis for this presentation are 30 interviews with patients and their
doctors. The analysis is situated in the project "Virtually Informed – The Internet in the
Medical Field" funded by the Austrian Science Fund, FWF, project number P-18006,
investigating the consequences of increasing availability and use of the Internet as a
health information source for medical practice.

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Technology, Organizations & Institutions in the Construction of Economic Value: The
Case of Biotechnology

Scholars suggest that the construction of new technologies arises around social processes.
We argue that a neglected aspect of technical chance is the construction of the economic
– the determination of an economic logic to define what value can be attached to a

technology. Analyzing the emergence and evolution of biotechnology, we show that its economic construction depended upon the ways that uncertainties in the technical, legal, regulatory and financial spheres were resolved. Based on the same underlying technology, approaches to understanding the value of biotechnology varied widely, with variation arising through entrepreneurial action at the level of the firm (for startups) and projects (for existing firms). On the basis of our historical analysis, we propose that the evolution of a new technology is a social process in which entrepreneurs are key actors whose role is to develop and promote different economic logics. These logics encompass more than recognition of a new market opportunity. Rather, they frame what is known about the entire economic configuration: the application of the technology, the boundaries of the firm, the degree of R&D intensity, etc. Moreover, entrepreneurs are informed by a wide range of economic evidence: government institutions that made decisions defining appropriability, financial markets placing value on technologies well before any products materialized, scientists producing technical evidence on viability, and firms making sense of the technology and its commercial applications. We show that the emergence and evolution of biotechnology is best understood as not just purely technical, but also, and unavoidably, economic.

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Competition in the wild; emerging figurations of healthcare markets

The social study of markets experiences challenging theoretical developments through the work of Michel Callon on 'the performativity of economics'. Callon questions positions of neoclassical economists that market mechanisms work since information is processed by a homo economicus and of economic sociologists proposing a homo sociologicus. He rather proposes that homo economicus and laws of markets do exist, but mainly since they are performed, shaped and formatted through the way economics frames calculative agencies. This performative approach opens up the construction of laws of markets to previously excluded actors, creating normative acting space for social scientists.

In this paper I explore how this work relates to the experimental involvement by STS researchers in the development of healthcare markets. Callon privileges materialities of markets as sites for enacting markets in particular ways. Yet, interventionist attempts of performing healthcare markets as 'value'- rather than 'cost-saving'-driven indicated that markets can 'work' despite the absence of such well functioning materialities. The involvement of social scientists in the construction of laws of markets is thus a less certain process than suggested by Callon.

I therefore pose to sensitize such engagements for historically shaped 'forms of probable markets'. The construction of (healthcare) markets is entangled in what Laurent Thévenot calls "conventions (…) [which are] involved in the collective creation of 'forms of the probable'". Analyzing such probabilities may be fruitful for broadening the present focus

on the opportunities for STS scholars to shape laws of markets and sensitize social scientists to the risks such experiments entail.

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Roland Bal, Chris Pollitt, George Dowswell & Stephen Harrison

Mediating and Translating Materialities of Governance - Performance Indicators as 'Investments in New Forms' of Governance?

The introduction of performance indicators (PIs) in the Dutch health care system in 2003 has mainly triggered discussions between protagonists and antagonists of 'new public management'. In contrast, this research focuses on the empirical analysis of what these indicators actually "do" in health care organisations and systems in general and in hospitals in particular. The central questions posed in this research are (1) how does this 'investment in (new) forms' (Thevenot 1984) by developing and introducing PIs interfere with old forms of complex (public) ecologies of knowledges and practices and (2) if and in what ways PIs, initially meant for the public accountability of hospitals, are taken up by the hospitals and 'publics' for improving the quality of health care.

In this paper I will present the first results of the empirical and qualitative research into the consequences of PIs in the Dutch healthcare system. The findings are based on (1) interviews with key actors who have been involved in developing the set of now 29 PIs for/with the Dutch Health Inspectorate and introducing them in the Dutch health care system and (2) on participatory observations in two hospitals.

The empirical analysis of such collective experiments is crucial for understanding their actual consequences in their respective ecologies and contexts. Only by empirically elucidating such consequences in their 'situatedness', can we analyse which interplays of modes of governance and of 'those to be governed' are productive and on which terms. This could be helpful to understand which mode of governance we may want to invest in.

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Pharmaceuticals First: Psychiatric Compliance in US Housing Programs for Homeless Populations

Recent scholarship on psychiatry and governmentality has characterized contemporary psychiatry as a "post-asylum" age in which neoliberal subjects take upon themselves the work of managing their own mental health and behavior.   This shift to self-governance has been accompanied by a dramatic expansion of illness categories implicating greater sectors of the so-called general public. With expanding consumption of prescription

medication treating "irregular" moods and behavior, pharmacology has been taken on by social studies of science as the case par excellence of governmental psychiatry today: the "freedom" of the pill has replaced the confines of the asylum walls.

Drawing from such studies, this paper considers the role of compulsory psychotropic pharmaceutical regimes in housing programs targeting homeless individuals designated severely or persistently mentally ill. It argues that even as the disciplinary techniques of the asylum spread and multiply across the social, the asylum has not disappeared, but has rather mutated into networks of federal, state and city agencies contracting with non-profit housing and treatment programs. The fact that many of these programs require compliance with pharmaceutical regimes in exchange for access to shelter challenges the notion of self-regulation put forth by accounts of governmental psychiatry. The form of power operating here looks less like governmentality, and more like what Michel Foucault described as "sovereignty," with a state apparatus directly intervening on bodies and populations subject to its authority. This paper suggests that in understanding the neurochemical technologies of pharmacology as interfaced with social technologies of control (such as the legal mechanisms that organize non-profit housing programs), we can amend theories of governmentality to account for the persistence of sovereign-functions enacted upon populations considered incapable of proper self-management.

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Building a legitimate way of knowing in obstetrics: the midwife/obstetrician controversy in France at the beginning of the XXI century

The proposed communication aims to examine how new ways of knowing birth attendance may emerge in the French context. France did not experience the advent of midwifery movements the USA, Canada or the UK underwent in the late 70's. The history of obstetrics in the past two centuries in France has been depicted as the successful taking over of birth attendance by male obstetricians from midwives. The scientific way of describing and helping the labouring women through technical innovations won over the midwives' way of knowing with their hands and ears and women's experience. Several factors may induce some change. The importance of technology in birth attendance makes it impossible to be used only by doctors, giving an opportunity for midwives to empower themselves by mastering more of the process. The recent changes in the admission criteria in midwives' school may also redirect more men than they used to, thus unbalancing the gender divide. Moreover, female medical school students choose to specialize in obstetrics in greater numbers than men. I intend to dwell upon a study I am undertaking of French midwives to sketch the possible reconfigurations of the ways of knowing and assisting birth in France. I would like to show how gender/technical/administrative/legal agendas intersect in the birth field to produce a new way of encompassing what is at stake when a child is born.

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14.10 Science Technology Studies, Disability Studies and Deaf Studies

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The session aims to consider the conference theme "ways of knowing" with regard to deafness and disability. Deaf studies and disability studies are two distinct scholarly formations, although both place corporeal, sensory and personal experience—most notably of social exclusion—at the heart of their concerns. Lived experience is centre-staged as a bottom-up or grass-roots form of knowing that is as often intuitive (or 'native') and phenomenal as it is reflexive and objectified. The knowledge that is generated is socio-culturally and socio-linguistically shared as much as it is empirically demonstrated and peer-validated.

At the same time, both deaf people and disabled people are the subject of highly formalised, normative kinds of knowledge practices—in fields as diverse as medicine, economics, biology, education and psychology—which do not speak with them, but about them (or worse, for them). More often than not, knowledge within these fields is of the body as a site of multiple meanings that fractures any coherent sense of self and identity. In this third scholarly formation knowledge is essentially derivative of professional practice.

The co-evolution of these three knowledge formations has long been a rich terrain for philosophical, historical, and sociological analysis. The aim of the session is to consider whether a conjoining of science technology studies with both deaf studies and disability studies might offer new means by which to cross-validate different articulations of a common knowledge object.

A position paper will be available for download at the Virtual Knowledge Studio website and at <http://www.univie.ac.at/LSG/downloads.htm> sometime before the conference.

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Brunel University

Disabled people's understandings of their own knowledge, barriers it faces and ways of overcoming them

This paper will draw on two recent user controlled research studies relating to the knowledge of disabled people/service users and the research which they undertake in order to advance and share this knowledge. The aim of this paper will be to share disabled people's views about how their knowledge may play a more central role both in the development of policy and practice and in research and theoretical development.

The first study is a two year one undertaken by Shaping Our Lives* which explored disabled people's views about their own experiential knowledge; how it might be shared both among disabled people and their own organisations and exert a stronger influence on mainstream social policy discourse. Disabled people identified a wide range of barriers limiting both their capacity to develop their own knowledge and to share it more broadly. These will be discussed in this presentation as also will disabled people's proposals for how to challenge these barriers successfully.

The second study** on which this paper draws is the first UK review of service users' definitions and understandings of service user or user controlled/emancipatory disability research. The presentation will focus on the particular qualities and benefits which disabled people feel this research has; consider the barriers it is currently facing and how these might be overcome.

*Branfield, F. Beresford, P. with Andrews, E.J. Chambers, P. Staddon, P. Wise, G. and Williams-Findlay, B. (2006), Making User Involvement Work: Supporting service user networking and knowledge, York, Joseph Rowntree Foundation, York Publishing Services.

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Cochlear implant surgery and cognitive enhancement: Ethics and choices

When cochlear implant surgery first appeared, signing deaf people viewed it as a threat to the existence of their community. Framing the discussion as therapy versus extinction; members of the signing deaf community argued that pursuing a cure for deafness was unethical and bore genocidal overtones. While this view is still held by some, increasing numbers of signing deaf adults and children are obtaining cochlear implants and choosing to remain connected to the signing deaf community. One reason often cited for this decision is that cochlear implant surgery offers the deaf person more choices; one can choose to wear the cochlear implant in the company of hearing people, or leave the cochlear implant off when in the signing deaf community.

Cochlear implant surgery research is currently evaluating the possibility of an internal device that is always functioning. Unlike today's generation of cochlear implant devices, which contain both internal and external components controlled by the user, the internal device would more closely replicate the experience of a hearing person by being "on" at all times. This raises several ethical questions for cochlear implant users and other forms of cognitive enhancement devices: to what extent should people have control over surgically implanted medical devices? Are there moral reasons that justify providing people with more control over their sensory perceptions? Are there limits that should be imposed on the kinds of controls that are used? In this paper, I identify and consider the cogency of several arguments related to these questions.

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'I was told I had a moral responsibility to society to abort my son as he would be deaf':
The Deaf/genetics interface

Deaf genes that are being identified are typically considered defective, suggesting a discourse that implies that eradication of such genes is the aim. But there is an alternative discourse, about who is defining the terms under which the Deaf gene is associated. It sees geneticists as mainly hearing people who have little experience of Deaf people and culture.

For those who have little experience of working with Deaf clients, their discourse may play on fears and scare stories through popular culture and from positions at the top of the 'knowledge hierarchy´. Those who have the knowledge and experience of being Deaf and who are comfortable and happy with deafness are cast as the `baddies´, but this is never seen in the context of who is determining the prevailing ideology of Deaf as defective. In resistance to the dominant discourse, geneticists have been labelled as eugenicists by some in the Deaf community. There is also evidence that some Deaf people have used the new technologies and sciences, backed up by the liberal values of choices and rights, to increase the chances of their child being born Deaf. Sections of mainstream Hearing Society have recoiled in horror at the thought.

What may turn out to become geneticists´worst nightmare may turn out to offer hope to a minority group at threat from ongoing attacks on their linguistic human rights. This paper will explore these issues, and the power of knowledge in science, in the context of Deaf involvement in a genetics project.

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Searching knowledge: CinemaSense as a case study in collaborative production of a www service in two universities

Our design research was carried out between 1999–2004 at the University of Art and Design Helsinki in collaboration with the Classroom Teacher Training Programme for Finnish Sign Language Users of Jyväskylä University, Finland. The design research was positioned in the areas of film, art, and pedagogy.

Aims of the project were to produce an accessible web-based study product, and to clarify deaf students' deepening of knowledge and conceptualization with respect to the subject of cinematic expression, as well as to understand the collaborative processes that occurred during the web-based course. These objectives were part of a general framework of inclusion.

The methodology was user-centric and participatory design approach. By merging action

research and production a collaborative study concept entitled CinemaSense (Elokuvantaju) was developed and produced (http://elokuvantaju.uiah.fi/).

Concept maps, questionnaires, e-mail messages, diaries and documentary films of participants were among the data collected. Additionally, all aspects of the inquiry learning process were shared with fellow students by using Computer Supported Collaborative Learning (CSCL). The data corpus was visualized using Self Organizing Maps (SOM). These maps provided us with a different way to see how the students' conceptualization evolved during the studies.

The results of the work include theoretical investigation and description of a design research process. The CinemaSense for flexible studies was produced. The research also increased understanding in interactivity of web-based study. We propose that similar methods can be applied in the production of multi-modal web courses and services that promote inclusion and flexible university study.

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Developing American Sign Language Identity Texts: How Deaf Culture and Heritage are Incorporated into the Classroom

This paper describes an exploratory study at the Ernest C. Drury School for the Deaf, Milton, Ontario, that comprises part of Early and Cummins' (2002) cross-Canada project From Literacy to Multiliteracies: Designing Learning Environments for Knowledge Generation within the New Economy. The Multiliteracies project builds on the concept first introduced by the New London Group (1996), who sought to define a new approach to literacy pedagogy that takes into account the cultural and linguistic diversity that is part of our schools and society, and the range of multimedia and information technologies that create new text forms and new ways of communicating. Focusing on the production of American Sign Language (ASL) identity texts by grades 2, 3 and 5 Deaf students, the E.C. Drury project is a collaborative effort involving teachers from three classrooms, representatives from the Canadian Cultural Society of the Deaf and researchers from the Ontario Institute of Studies in Education (OISE), University of Toronto. The specific ways in which this project adapts the format and objectives of the larger study can be traced to the teachers' use of the ASL curriculum for first-language learners as their basis. The ASL curriculum is in use to foster ASL literacy and academic ASL learning across all grade levels at the three bilingual, ASL and English provincial schools for Deaf students in Ontario.

In this study I have asked the following questions:

1. In what ways did this project encourage the cultivation and expression of Deaf students' linguistic and cultural identities?

2. How have the students responded to the learning environment and conditions created by the project?

3. In what ways could this project serve as a model for other classrooms, and how might what we learned at E.C. Drury facilitate the construction of identity texts by other ASL-using Deaf students?

4. Finally, how might Deaf students' development of identity texts promote collaborative critical i (Abstract over length limit)

Discussant: Lennard J. Davis
University of Illinois at Chicago

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14.11 Styles of Science and Technology
        Lesley Biggs (chair)
        Papers by Lesley Biggs, Chunglin Kwa, Hamid Ekbia, Linda F. Crafts, Berti
Moltu, Niki Vermeulen

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Competing Views of Science Within the Chiropractic Profession: A Discursive Analysis
of Empiricist and Rationalist Philosophies

Introduction: Chiropractic philosophy has been a source of major controversy both
within and outside the profession since its inception. Few studies have subjected this
debate to a discursive analysis in order to understand the epistemological basis of this
controversy. Objectives: The purpose of this study is to explore the meanings attached
to the empiricist and rationalist philosophies in the construction of the professional
identities of chiropractors.

Methods: Semi-structured interviews were conducted with twenty chiropractors
practising in the Toronto area. Using NVivo, a content analysis of the participant
responses was performed comparing empiricists' and rationalists' views, inter alia, on
science, as well as within categories.

Results: Both empiricists and rationalists believed that science was important for
validating chiropractic. However, the two groups diverged in what constituted 'good'
science existed. Considerable differences between rationalists and empiricists were also
found regarding concepts of health and illness, philosophy, and definitions of holism.
But we also found within groups subtle variations in the meanings of these concepts. But
the differences between empiricists and rationalists became blurred when the discussion
centred on clinical practice with both groups acknowledging the importance of
'experience' and 'intuition' in making a diagnosis and determining course of treatment.

Conclusions: Differences between empiricist and rationalist chiropractors reflect
different epistemological orientations; neither position is necessarily anti-science but
each group relies on different constructions of science. This research suggests that the
differences among chiropractors at the rhetorical or discursive le vel may not be as
evident in their clinical practice.

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Styles of science and technology

Alistair Crombie proposed that there are six scientific styles, and he wrote a comprehensive history the origins of each of them separately: the deductive style, the experimental, hypothetical modeling (based on analogy), the taxonomic, the statistical and the historical styles.

  The justification to treat the history of styles separately is twofold. The first is a philosophical point: no style can serve as a foundation for any other, no style can be reduced to another. The second bears on their historical contingency. Each style has its origin in a certain historical period, ranging from classical Greece through the Renaissance, and the 19th Century. The number of six is obtained inductively, by historical investigation. There is no a priori reason why there could not be seven or eight, and perhaps there will be in the future.

  Each of the styles may be seen as having brought together 'conceptions of the rational, the possible, the desirable, and the acceptable'. In my discussion of the concept of style, I will show it can be saved from Zeitgeist-like conceptions. Styles solidified as texts, practices, and institutions and were thus given some form of historical continuity right into the present (no style has as yet disappeared). But if we would follow the history of the styles much further into the present than Crombie did, one would see a number of conceptual changes, along with changes in the cultural practices embedding them.

  A further amendment to Crombie's scheme is necessary: the many historically realized alliances between styles. This gave the sciences enormous possibilities to proliferate in many directions, all the more since there are no fixed recipes for how to combine styles, as in the case of the experimental and the statistical style, or the taxonomical and the deductive style. And I will discuss the necessary inclusion of a seventh style: technoscience.

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The Informational Style of Thinking

Is there such as thing as "styles" of thinking? I want to suggest that there is, in the same sense that there are styles of art, music, and reasoning (Davidson 1999). Drawing on Foucault's notion of "regimes of truth," I'd like to argue that each socio-historical period allows specific styles of thinking, and discourages others, through its cultural and material practices. The most recent example of this is what could be called the informational style, which has prevailed within diverse social groups in the developed world in the last few decades, in particular in the disciplined practices of scientists, scholars, managers, and so on. This trend is discernible not only in the emergence of new areas of research - computational economics, agent-based modeling in social science, etc.- it is increasingly the style of choice in most scholarly and professional work (albeit

unconsciously in some cases). The informational style is distinct from other styles (e.g., magical, religious, rational, etc.) through its relational, dialectic, recursive, and distributed character. Based on the preliminary outcome of an empirical study, I will illustrate these features by drawing on examples from various disciplines and practices.

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Ways of Bodily Knowing and the Democratization of Technology

There is an increasing focus on the body and embodiment as foundational for knowledge in general, going back especially to the ideas of Merleau-Ponty. At the same time, the body-technology relationship is being explored from multiple perspectives, including the constructs put forward by scholars such as Ihde, Haraway, and Clark. The conjunction of these two foci provides a way to move from the generality of "the" body and its relation to "technology" and "knowing" to the specificity, multiplicity, and complexity of relations among multiple dimensions. These include conceptualizations of the body, such as phenomenological, psychoanalytic, cognitive-scientific, health/medical, etc.; bodily modalities, such as instrumental, aesthetic, and erotic; technologies, such as the steam engine, the computer, etc.; cultural contexts, such as, Asian, European, American, socio-economic class, etc.; and ways of knowing such as theoretical, banausic, tacit, artistic etc.

If the democratization of technology means increasing people's – or the people's -- control of the technologies that impact them, then it must take into account the multiple and complex forms of bodily existence, acting, and knowing that are part of the human-technology interaction. Of particular interest are the silent, overlooked, or unseen aspects of these body-technology relationships that when illuminated shift our way of knowing in the world. We focus on these less privileged aspects of the "body-technic" using examples from differing social, historical, and cultural domains to analyze their implications for the democratization of technology and to extend the boundaries of that discourse.

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Satirical and romantic stories about organisational change

This article analyses different perspectives on organisational change using Hayden White's genre categories: romance, comedy, tragedy and satire. White maintains that a "story" is not determined by data, events or the particular case, nor by the way events are remembered, collected or told. Narrative structures are pre-configuring; they determine in advance what is accepted as a story and the meaning that will be created.

The empirical material used is mainly the literature on Actor-Network Theory (ANT), Action Research (AR) and Business Process Reengineering (BPR), representing different perspectives on organisational change. Supplementing and contrasting the discussion of genre classification, this article draws on literature from two different and well-known perspectives from work and organisation: critical sociology and the Swedish school of pragmatic professional knowledge production.

The literature describing ANT is mostly of a satirical character, while the literature describing participative action research is more romantic. BPR literature combines the satirical and the romantic genres. In addition, possible ramifications of this classification, i.e., which strategies for change are predominant within the different genres, and the consequent implications for action are considered. I conclude that combining between satiric and romantic narratives provides the best prospects for success when implementing organisational change programmes.

Different perspectives from different genres, predefining what conclusions will be reached and what actions are seen as possible, are mainly a reflexive insight on how facts are produced. Awareness of these predefined limitations within the genres gives us academicians a possibility to understand or even the freedom to choose our stance. This article discusses actor-network theory (ANT) and participative action research (PAR) in order to explore possible new and different perspectives on ANT within the field

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Big Biology. Towards a new style of research in the life sciences

Are we witnessing a new style of scientific research? Since the Human Genome Project a heated debate has been going on about the 'bigness' of biology, framing transformations in the life sciences in terms of growth. At stake is not only the project itself, but the character of research in biology. Does the HGP symbolise a new style of research in the life sciences and if so, is this development desirable? In line with the concept of 'big science', the discussion on transformations in the biological sciences has an empirical as well as a normative component. By analyzing various large-scale research projects in the life sciences I have identified a new style of research. Although similarities are found between traditional 'big physics' and contemporary 'big biology' collaborations, I will argue that biology exemplifies a new form of 'big science'. Changing socio-cognitive arrangements around technological developments result in a networked form of 'big science'. This new science is geared to innovation and being embedded in society, with implications for the work practices and the career paths of scientists. Nevertheless, this new collaborative form of research does not exactly substitute the more traditional small-scale 'lab-bench' science, but can be seen as a new 'way of knowing' in the life sciences refining Pickstone's view on contemporary techno-scientific complexes.

END

15.1 Governance of Science and Technology
    Chair: Udo Pesch
    Presenters: Udo Pesch, Alan Irwin, Stephen Healy, Roxanane Mitralias, Stans van Egmond, Annick de Vries, Dominique Linhardt

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How Economists Want Improve Our Lives, and Why They don't Succeed:

Regulatory Impact Assessments (RIAs) have been developed by economic theorists in order to make ex ante evaluations of new policy proposals. These policy tools confront the costs of proposed legislation with the potential benefits, so that policy-makers can choose the 'best' policy option.

RIAs have been first introduced in the United States. Since then, the method of RIA has gained support as being an appropriate tool for streamlining political decision-making. Recently the European Commission has presented RIAs as a central tool in European policy making. The adoption of RIAs in Europe is accompanied by some far-reaching extensions of the role that RIAs are thought to fulfil. First, they have been set up to also take issues of sustainable development into account; second, the European Commission considers that RIAs can figure as appropriate policy-making frameworks in which consultation of stakeholders can take place. These extensions are thought to play a role in the increase of the public legitimacy of the European Union.

The paper describes the development of the take-up of RIAs in Europe, which shows many promises but few results. The case of RIA shows how economist descriptions have been taken up as the norm of rational behaviour: any conduct that differs from this norm is seen as inappropriate; moreover, using the boundary work-approach, the conceptual scheme presented in RIAs proves to be highly inadequate.

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Nations at ease with radical knowledge: Science, technology and consensus in contemporary Europe

It is a commonplace for European STS researchers to draw attention to the contested and often-controversial processes of scientific innovation. This paper is not concerned with the further exploration of societal responses to technical change but rather with the political, and especially governmental, reaction to (and construction of) these issues. It would appear that – at least in certain European countries - the social scientific portrayal of sceptical public groups has resonated strongly with policy and institutional

representations of the need to create a more receptive culture for science if successful innovation is to occur. In these circumstances, a characteristic institutional response has emerged within Europe which acknowledges the significance of critical voices but calls for a new social contract – or, in the European Commission's terms, a new partnership – between science and society.

In this paper, we will explore key elements of this partnership and particularly the manner in which it has attempted to create a European public space based on notions of dialogue, transparency and consensus: what the Commission describes as pooling 'efforts at European level to develop stronger and more harmonious relations between science and society'. Our primary intention here is less to criticise or challenge this emergent formulation than to view it as an important phenomenon in itself and as a productive force in the creation of a distinctive European identity. What kind of governance is this – and what are likely to be its consequences for the shaping of both European society and European technology?

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Science and Technology as Ways of Governing

While science studies has long been concerned with knowing as doing less attention has been paid to the political import of this shift in attention from the cognitive to the praxiographical. This is, partly at least, a result of the limited engagement to date between science studies and those elements of Foucauldian sociology concerned with the ways knowledge services government. This paper addresses this by drawing upon elements of both these literatures. Although Joseph Rouse effectively extends Foucault's arguments regarding power/knowledge to the case of natural science his analysis of the implications of these insights for the exercise of government is limited. This paper draws these out by building upon the resonance between Foucault's relational conception of power and the relational basis of STS perspectives concerned with praxis to address the form of life constituted by 'thermal monotony' (the standardised indoor thermal regime provided by air-conditioning). 'Thermal monotony' is maintained via scientifically delineated norms of thermal comfort that configure a standardised, homogenous 'comfort zone'. The homogeneity of this zone is reflected in complementarily homogenous embodied dispositions, cultural norms, buildings and built environments echoing recent analyses of 'technologies of government' (Rose, 1999). The implications of this analysis for the government of contemporary technological societies will be briefly addressed.

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Genetic resources : a problem of international governance.

The production of scientific and technical knowledge vary according to the period. Since the 1970's we are facing a major scale change that affects the international governance of science.

We are proposing here to understand how this transition was made, as regards to genetic resources. For a more detailed analysis of this, we are going to follow the Commission of Plant Genetic Resources founded by the Food and Agricultural Organization of the United Nations.

Indeed, from its establishment in 1983, this intergovernmental commission tries to become at an international level an instrument of decision making referring to genetic resources. Real forum, where international conflicts of interests emerge, this commission also becomes an important place for regulation of some major questions : plant breeders and farmers rights, biotechnology products and farmers varieties and wild material.

During the ten first years of functioning of this commission, different actors negotiated permanently the genetic resources (useful for food and agriculture) status, but also the level of regulation wished. The positions of the governments changed and new agreements were designed. In this ten years gap the idea that genetic resources are part of the humankind heritage was questioned. This opened the possibility for the patenting of genetic information and for the transformation of genetic resources into commodities...

Which are then, the precise means carried out on an international level in order to allow such a transition?

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What ecological networks and market based health programs have in common:Discussing the role of scientific models in Dutch policy making

The aim of this paper is to discuss the process of model making as a political process, that is, to come to a useful model that satisfies both the scientists working with the models and the policy makers using the model outcomes. Therefore both the scientific knowledge and the policy options and demands that need to be addressed have to be negotiated. Models that are used for this specific purpose can be seen as hybrids of scientific standards and policy demands, and are political in that they (try to) depoliticize the policy problems for which they are used. Our examples show that the construction of model parameters is a 'political' process during which scientists and policymakers have to negotiate their own and the other's standards. The paper will conclude by reflecting on the notion of 'boundary work' as a 'tool' to analyze the processes, negotiations, and model constructions mentioned above.

Annick de Vries
University of Twente

Policy makers and uncertainties: towards 'practicable' uncertainty information

Uncertainty is an issue of growing concern. Uncertainty assessments and risk calculations are becoming increasingly important and are, as a result, provided more and more by diverse expert organizations. The outcomes assist policy makers in decision making.

In this paper, I look at both an economic and an environmental assessment agency (the CPB and the MNP), that deal with uncertainties in different ways; the presentation of uncertainty varies essentially. One organization turned out to produce extensive uncertainty information whereas the other seemed to prefer a selective and 'educating' way of presenting uncertainty. This implies that the former leaves less room for policy makers to interpret the uncertainty information themselves than the latter. But what is perceived as more useful for policy makers? Less autonomy and ready-to-use pieces of uncertainty information, or large autonomy and an extensive review of all possible uncertainties? And what explains the difference in presentation of uncertainties?

It turned out that the ready-to-use pieces of uncertainty information were used more frequently. I explain this with the help of the political context and of the various (strategic) purposes of policy makers. Further, I argue that the main reason of this difference is the extent of alignment between the assessment agency on the one hand and the main ministries on the other hand. I define four factors that enhance this alignment. In the end, I attempt to come with solutions for better ('practicable') uncertainty communication, given the political context and the possible strategic needs of uncertainty information.

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An experiment into the self-description of the state

In this paper, we outline and discuss the first results of a research project aiming at analyzing the current reform of public management in France. The reform of the budgetary process initiated by the LOLF (Loi organique relative aux lois de finances), an act voted in 2001 that sets the bases for a radical transformation of public finance (and which is often referred to as the "revolution" of the financial constitution of the state), includes novel features such as the design and implementation of a large set of quantitative indicators that account for the performance of public action, and also a new nomenclature to account for the allocation and the execution of budgetary resources. The reform is indeed motivated by notions of performance and transparency, as well as by the will to promote an enhancement of the politicization of budgetary choices. As such, it is also an experiment into the self-description of the state. We set out to analyze this experiment from a perspective grounded in science and technology studies. We explore the origins and evolution of the devices that are being developed in order to implement

the reform. We discuss the implications of this case study for connections between science and technology studies and political sociology.

END

15.2 Stem Cells
   Chair: Kristen Intemann
   Presenters: Kristen Intemann, Maja Horst, Arelena Jung, Nathan Palpant, Kristin
   Lofthus Hope, Michelle McGowan, Gouk Tae Kim

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Values & the Production of Scientific Knowledge:

Current discussions on stem cell policy have brought to the forefront the issue of whether non-epistemic values are appropriate ones to regulate scientific research and set research priorities. Many scientists argue that science should be autonomous, or left to its own devices in deciding how scientific problems are defined, determining research priorities, and conducting research. When, like in the case of stem cell research, non-scientists, including policymakers, set research priorities or constrain funding, it is decried that "subjective" values are inappropriately dictating scientific decisions. Hence, scientists have argued that scientific considerations, not moral or political values, should regulate public policy on stem cell research. Focusing on stem cell research, we criticize autonomy as an ideal for science. Indeed we show that those who argue for such an ideal are inconsistent when they do so. Furthermore, while we acknowledge the problems with how political administrations regulate scientific research, we argue that the problem is not that ethical values are been brought to bear on science per se, but that those endorsing such values are 1) a select few who have power, and 2) often lack the scientific expertise necessary to understand how ethical concerns may relate to the research. In the last section we offer an account of how value judgments might be incorporated in stem cell research in ways that make for more fruitful and more responsible science.

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Public engagement with STS: Experimenting with the social science laboratory

Public understanding of science and science communication are well known areas of empirical investigation for STS scholars. After more than a decade of critical PUS, demands on scientists to get into dialogue, and various experiments with public engagement in the governance of science, however, one question remains to be explicitly debated: how do STS-researchers propose to communicate dialogically with the many stakeholders and publics?

This paper presents an experiment with spatial communication of research into public opinion formation about biotechnology in Denmark. It reports from the construction of an installation entitled 'Stem cell network II: landscapes of expectations', which will be presented to the Danish public in April-May 2007. The interactive installation will be placed in public and among various groups of stakeholders with the aim of stimulating dialogue and reflection about the social shaping of new biotechnologies.

The installation is constructed to communicate research questions and fundamental theoretical propositions. It is designed to invite visitors and other stakeholders to engage and interact, and thereby change the messages and research questions embodied in the installation. In this way, the installation is an effort to create comments, objections or even resistance to the social science communicated in order to make the knowledge produced more robust. It is for this reason that we have imagined the installation as a social science laboratory.

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Different forms of credibility between science and society and its effect on the credibility of science

My talk addresses the dependence of the credibility of science and scientific knowledge on different forms of relationships between science and society. It is a recurrent claim of current science and science communication studies that the increasing proximity of science to its social environment leads to a paradoxical situation, in which scientific knowledge gains importance in a wide array of social areas from political decision making to economic production processes and at the same time thus looses credibility. The assumption is that both the increasing application and visibility of science (for example in the mass media) as well as the use of science for legitimating political decisions leads to a gradual erosion of the "myth" of the objectivity and certainty of scientific knowledge.

One of the central areas influencing the public construction of science is the mass media. In my talk I will present results form the research project INWEDIS on the construction of science in the German media coverage of stem cell research and epidemiology. Both are scientific fields that are tightly coupled to their social environment, but each in very different ways. The comparison of these two fields serves to formulate hypotheses concerning the dependence of the effects of the proximity of science and its social environment on the credibility of science. The hypothesis discussed is that it is not alone public insight into scientific uncertainty that leads to a loss in credibility but rather the coupling of scientific disputes with political and economic interests.

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The Praxis of Scientific Epistemology: reaching political and social resolution to the debate over human embryonic stem cell research

The debate over research using human embryonic stem cells continues to perplex scientists, politicians, and the lay public alike. Standing in the midst of the dynamic vigor of this debate we ask ourselves: why is the debate over hES cell research so intractable? This intractability may, in part, be the consequence of our competing understandings of hES cells and the broader conflict within science itself which is reflected in the sociopolitical controversy.

   This paper first sets out to understand human embryonic stem cells as contested socio-technological artifacts. How are they envisioned? To address this requires, first, an understanding of how different groups within the debate linguistically define these objects as "embryonic" "stem cells" of "human" origin. In addition, these perspectives import differing value on the "humanness" of hES cells. In other words, to what extent does this unique type of technology as essentially a co-opted component from the natural process of human development define the arguments of the debate? Establishing the social context of hES cells etymologically and ontologically leads to my last aim. Speaking from the perspective of a biomedical research scientist I am interested in the unique, and perhaps conflicting, roles of the scientist as a gatekeeper of knowledge, a moral authority, and an interest group in this controversy. How do scientists define hES cells as a technology? Due to their multiple roles in this debate, is it conceivable that scientists have a distinct opportunity to develop consensus that could translate into a palatable resolution publicly and politically.

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Hope and/or Hype? How Stem Cell Research Shape Expectations of the Future

The paper will look into the construction and creation of vision connected to the scientific development within biotechnology, especially stem cell research, since the development within genetics touch upon complex moral and existential questions between nature and culture. The technological innovations and the accounts of the progress is part of the creation of the facts produced. In the construction of visions and expectations, different technological possibilities and potential facts are connected to visions of the future. A vision is not a reality, but it is possible to use visions as a foundation when building alliances between actors or stakeholders who can contribute to a possible realization.

The focus in the project is to examine the co-constructing of the desired (visions) and the possible (fact), leading to construction of factish's (Latour 1999), connected to stem cell research and the possibilities promoted. Empirically we use web analyses, interviews, and document analysis to see how the research community, among others, promote and communicate visions of stem cell research in Norway. Although, this is a field that is very much connected to a global market and therefore it will be compared to an international development. It is an aim to look into how researchers, politicians, representatives from the biotechnology industry, patient advocacies, - how all these different stakeholders work together to create the market for stem cell research, an innovation that is still quite young. Are visions a part in creation of the markets, and if so – what are the forceful visions?

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Stem Cells and Slippery Slopes: "Experts" and the Public Regulation of Preimplantation Genetic Diagnosis

This paper analyzes how risk and responsibility regarding preimplantation genetic diagnosis are conceptualized in the print media in the United States (US). Preimplantation genetic diagnosis (PGD) is a technique at the center of a growing public debate over the risks and limits of scientific interventions into reproduction and genetics, and provides a timely example of how varied ways of understanding new biotechnologies enter into public discourse. US print commentary on PGD has focused on social and ethical implications of the use of PGD for sex selection, creating designer babies and politics of the embryo both with regards to embryonic stem cell research and the personal use of PGD by prospective parents. Contemporary media discourse over the socially acceptable bounds of PGD's usage privilege the voices of scientists, medical practitioners, bioethicists, theologians, and legal experts, while the perspectives of the people who use PGD are notably absent. Analyzing major print media coverage of PGD provides insight into how these various "experts" justify or condemn uses of reproductive genetics even in the absence of formal political regulation of this technique. The impetus of this analysis is to highlight the discourses at work in commentary on this controversial technology, and to address how representations of PGD privilege experts' narrative lines, thus contributing to the production of a particular range of public understandings of reproductive genetics.

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Visual Representation in Modern Scientific Practice

Analyzing the role of visual representation in science has become one of the new and promising research fields in STS since scientists use visual images to help others understand their research as well as to build scientific knowledge and networks. The main research questions in this field would include: What is the major contribution of visual images in the construction of scientific knowledge? What are the major characteristics of scientific images?

However, scientific images can also reveal potential to harm the scientific development. The scientific misconduct demonstrated in S. Korean stem-cell research controversy is one case that shows how scientists can manipulate the visual images of research results to make their research look real. Thus, other research questions would include: What kinds of side-effects of visual images can occur in science? To what extent can we accept the manipulation of images in science and how do we establish guidelines for their use? What cases can be used to show whether visual representations go right or wrong?

In this paper, I will look at the role and contribution of visual images in science and propose that visual representation is an important tool for constructing scientific knowledge, but that proper tools and systems are needed to guide its development. Analyzing the stem cell research controversy from this perspective has already been done. Choosing another case that shows the positive impact of visual images in science and a comparison with the stem-cell research controversy will be done.

END

15.3 Climate Policy Initiatives and Science for Policy - climate policy

Organizer/chair: Erich Schienke
Penn State

Global climate policy initiatives have mainly emerged from the U.N. Framework Convention on Climate Change (UNFCCC) and supporting processes, such as the Kyoto Protocol. However, actual implementation of mitigation and adaptation options, such as agreeing and adhering to admissions caps, are measures being worked out by urban and regional governments. For example, in the U.S., most policy is being developed by state and city governments, with the expectation that the federal branches will eventually follow, even if by rule-of-law, as in the GHG emissions case of Massachusetts v EPA. Many of the problems currently being faced by decision-makers emerge when attempting to make sense of the various trade-offs available between energy options and in the management and crediting of carbon stocks. Making sense of all the options requires intensive evaluations of the scientific data and technological constraints; processes that require strong communication between decision makers and expert advisors. As a result, many new forms of communication and dispute resolution between decision makers and experts are beginning to emerge and take hold in the policy-making process. The papers in this panel present a series of case studies in the communication and collaboration between decision makers and experts in carbon, climate, energy, transportation, and ecology, among others.

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Carbon science for climate policy making: Issues of scale and new modes of science-society interaction

Because of concern over climate change, society at many levels is considering options to mitigate or sequester CO_2 emissions. In addition to actions focused on the energy system aspects of the problem, the scope of options now includes examination of options for deliberate management of the land surface, ocean depths, and energy systems in order to mitigate CO_2 and CH_4 emissions and to remove CO_2 from the atmosphere. While much of the impetus for action on climate change has come from international processes negotiated between nations, the implementation of policies will occur at a wide variety of governmental and sectoral levels—from local city pledges to statewide legislation in the United States to credits for agricultural practices to national commitments. Scientific knowledge on the carbon cycle may be able to provide potential information for this dialogue, but it is not clear that the carbon cycle scientific enterprise is organized well to respond to needs at these scales. This paper will outline some of the findings from other areas of earth science that have explored how best to create knowledge useful for

decision making, and explore how they might be applied to the carbon arena, including supporting decision making within the emerging governance structures related to carbon.

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Agrocomplexity and Socioeconomic Dimensions of Climate Change: The Kenyan Experience

This paper examines the socioeconomic dimensions of climate change on agriculture and food security in Kenya, and directs attention to the need for interdisciplinarity research on climate change issues and policy formation. While climate changes are felt globally, their impacts are disproportionately distributed, especially in Sub-Saharan Africa, where the world's poor remain most susceptible to the potential damages inherent in a changing climate. Sub-Saharan Africa is one of the world's most ecologically vulnerable to effects of climate change. At the same time, these countries are least equipped to adapt to the effects of climate change. Extreme events such as droughts and floods are becoming more frequent and more severe. Drawing on recent fieldwork in Kenya, this paper describes how climate variability exacerbates food insecurity; the kinds of climate information that are now being developed; and the kinds of technologies, organizations and expertise that will be needed if new forms of climate information are to benefit vulnerable populations. Preliminary findings show that new forms of expertise are needed to be developed at all scales, and linkages among stakeholders and between organizations functioning at different scales will be a considerable challenge. To facilitate development of the kinds of expertise and organizational linkages needed, I propose a conceptual framework that accounts for what I term ``agrocomplexity.''

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Robustness of GCMs: the Policy Context

Much of the debate about the reality, urgency, and best solutions to the problem of climate change draws upon a wide-ranging scientific enterprise organized around efforts to model human and natural systems. Thus any discussion of the place of science within political debates over climate change would be well-served by a consideration of how modeling and prediction may or may not be useful in such arenas. This has become a question of concern in both academic and political circles. How are we to understand and characterize the uncertainty inherent in General Circulation Models (GCMs)? How can political and other decision making processes effectively engage the results of models? Discussions of model uncertainty often center on individual models and the processes they represent. In this project we engage a different, very simple question: to what extent does agreement or disagreement among different models tell us something about the reliability their results? Building on the philosophical arguments of Richard Levins - that

the results of independent models may be considered robust when in agreement - we investigate the independence of GCMs, and thus, their potential to produce robust predictions of future climate. Part one will present the philosophical argument and then apply it to GCMs. Part two - the focus of this paper - places these results in the context of policy debates over climate change. We argue that the robustness approach to evaluating climate models may have much to offer by way of informing modeling efforts as a scientific endeavor. However, the political value of such a revelation (as with any other effort to address scientific uncertainty toward political ends) should not be over-emphasized.

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Shifting Research Priorities: The Role of Human Dimensions of Global Change Research

For several years, the only known dimension of global change research was in the natural sciences. It was the purview of geologists, biologists, and atmospheric scientists, not of sociologists, economists, or political scientists. But in the 1980's, things began to change. Climate-sensitive communities around the world began to recognize their vulnerability to changes in climate. They wanted to know more: to understand the societal impacts of global change. Consequently, 1990 saw the advent of several formal human dimensions of global change research programs around the world. These programs aim to understand the human causes, consequences, and responses to global environmental change. They also seek to inform and influence program managers' decisions about what research to fund, and therefore what climate information to produce. For example, if human dimensions research reveals that seasonal climate forecasts can increase the resilience of farmers, it promotes further research and development of seasonal climate forecasts. Thus, human dimensions research aims to impact the kind of science that we fund and the kind of products that we produce. Now after 16 years of human dimensions research, this presentation assesses its impacts, its successes, and its failures. It asks: how has climate science changed as a result of human dimensions research? Does human dimensions research, in fact, influence the climate products we produce and the research we do? This presentation will offer some answers to these questions, as well as suggestions for social science of climate researchers who seek to impact decisions about climate science.

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The Agora Explored: Producing Useful Climate Science for Policy Makers

Policy-makers from around the world are calling for the production and diffusion of more useful scientific information to inform climate policies. Ideally, useful information expands alternatives and clarifies choices for decision makers. But much of climate

science today is grounded in the 'linear model' in which information flows from basic research, to applied, and eventually society. Science is curiosity-driven, unfettered by policy demands or the immediate needs of society. Although effective in a wide variety of situations, the linear model falls short in providing useful information for decision makers, over simplifies what is essentially a complex and dynamic relationship, and creates a science-policy gap resulting in knowledge shortcomings for policy makers. Many scholars have suggested new approaches to science policy. Examples include Gibbons et al.'s Mode-2 and "socially robust" knowledge, Kitcher's "well-ordered science", and Stokes's "use-inspired research". Together, these authors suggest that science can be pragmatic, policy-relevant, participative, democratic, and that policy-relevant research will not necessarily sacrifice the value of pure basic research. This paper examines and discusses these propositions in the context of the U.S. National Oceanic and Atmospheric Administration's *Regional Integrated Sciences and Assessments* (RISA) Program. RISA's goal is to provide policy-relevant climate information to a variety of decision makers such as water managers, public health officials, fisheries managers, etc., yet each of the eight regional programs functions independently, providing rich fodder for individual case and cross-case comparisons. Additionally, this paper identifies the best practices and shortcomings of the various approaches utilized by RISAs, and places the knowledge gained from this research in the broader context of science policy research.

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Carbon markets and *kaitiakitanga*: how climate incentives can benefit indigenous Maori landowners in New Zealand

The Kyoto Protocol created an international market for climate mitigation activities, including the removal of carbon dioxide from the atmosphere through reforestation. In New Zealand, a recent national policy allows private landowners to register and sell the mitigation credits from reforestation on their lands, providing a new source of revenue from native forest restoration. As a result of on-going efforts to restore their land rights, Maori now hold a considerable amount of eligible land in communal ownership. Owners of these lands stand to gain from the stored carbon in their regenerating forests, but the path to receiving these benefits, as well as the trade-offs, remain unclear. In this work, we bring together science, economics, policy, and culture to illuminate the potential for Maori landowners to use carbon markets to help achieve their development goals. Using ethnographic techniques, we investigated the role of Maori values, institutions, and governance structures on land management decisions. We then used spatial mapping, forest modeling, and economic scenarios to predict the potential economic value of carbon storage on Maori land. In a pilot project, we examined the process of registering, measuring, verifying, and selling carbon credits for Maori land and identified the components of a land management system that meets the policy conditions while maintaining the cultural values of the forests. Finally, we constructed a model to

examine the role of Maori decision processes and the potential impact on the landscape. We find that carbon markets can play a role in helping Maori develop sustainably.

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Investigating the Emergent UK Politics of "Carbon Ethics"

Climate change has been in the news since at least 1987. However, over the last year or so the issue has attracted renewed attention in the UK, especially after the Stern Review on the Economics of Climate Change, released on October 30, 2006. The issues of 'carbon trading' in general and carbon commodification in particular has become a matter of debate. Is 'carbon trading' a solution to global warming or just an equivalent of medieval 'indulgences', as one commentator has claimed? Is 'carbon offsetting' just a way to ease people's consciences without actually reducing CO2 emissions? Has carbon just become yet another 'commodity' used by clever businesses to reap financial and at the same time seemingly ethical benefits? The former US Vice-President Al Gore's 2006 documentary film about climate change, 'An Inconvenient Truth', has been widely discussed in the UK. In the film, Gore states that dealing with man-made climate change is 'really not so much a political issue, as a moral issue'. How, though, is this new morality being framed? How is a fictitious 'average' national carbon emitter or carbon footprint being constructed and what does it conceal?

This paper uses approaches from science and technology studies to investigate the emerging politics of 'carbon-ethics' at the intersection between activist, policy, market and media discourse. We investigate the new language that is now evolving of carbon criminals, carbon sinners, carbon champions, carbon critics, and carbon profligacy and highlight the significant conflicts and tensions that remain beneath an apparent moral consensus.

END

15.4 Consumers, Patients, and Health
Chair: Anne McCulloch
Presenters: Anne McCulloch, Kevin Patrick Corbett, Maiko Watanabe, Harald Kliems, Eliza Slavet, Seth Messinger, Stephen Timmons, Kelly Fox

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Accessing Knowledge?: People's Use of the Health Information they Seek on the Internet

The ways people in Canada use the internet to know more about health are often unfruitful. They face challenges both in using the technology and in making sense of the information they find. This paper examines the processes through which people search for health information and ultimately questions whether they can put the information they find to use in their lives. Looking beyond internet search strategies to understand how people determine which information to deem credible and correct in which situations offers insights into their conceptions of health knowledge. Interviews were conducted with 25 people living in Canada who search for health information on the internet, often as well as through other sources, and who are aware of the Canadian government's health information website, the Canadian Health Network. Search strategies were often limited to known websites or all-purpose search engines. Scientific evidence and government publications were often valued by users who looked for indicators of credibility ranging from the author's qualifications or institutional affiliation to who provided financial support and whether a clinical trial was peer reviewed and published in a reputable journal, while other users value websites that are easy to navigate and information that is easy to understand. Surprisingly, websites presenting personal experiences were rarely valued, except by a new mother caring for her first baby. Prior professional or experiential knowledge about health and the internet often came to bear on how people made sense of the information and whether they made use of it for their intended purpose.

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"You've Got It, You May Have it, You Haven't Got It:
The Unintended Consequences of HIV Testing"

This paper considers the experiences of health consumers who have undergone diagnostic screening for HIV antibodies, T cells and viral load. These HIV-related screening tests are deployed for the purposes of making definitive diagnoses yet some consumers of testing experience imprecise outcomes. Drawing on an analysis of differing end user experiences of these tests, where consumers' knowledge reflected the multiplicity and heterogeneity in test design, I explore how these experiences reflect particular knowledges about these tests. The paper aims to contribute to efforts documenting how

health consumers are active end users co-constructing the social meaning of technologies in mutual relations with other users. I discuss how this knowledge can be used to delineate a greater role for health consumers in evaluating screening as well as for building a broader understanding of test design and performance.

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Direct-to-Consumer Genetic Testing Service in Japan - Struggle to Generate Public Confidence in Genetic Tests in the Consumer Society-

In the presented paper, we will exhibit the way in which various actors struggle to generate confidence in genetic testing services now provided directly to consumers in Japan. Genetic tests once the most advanced service provided only in the medical setting are now on the market in the international society. One of the concerns this phenomena causes is that some service with poor quality, which already exists in society, might degrade public confidence in genetic testing service in general. In order to avoid such, stake holders in the world are now struggling to address the issues, taking various approaches. The presented paper will focus on the struggle of Japanese stake holders, especially the industry, the government and the related academia. (Lack of consumers in this struggle may be a problem of Japanese situation.) These actors with different interests regarding the genetic test are both cooperative and competitive. The presented paper will analyze the factors to compete and cooperate in the process, in which the actors together generate public confidence in genetic testing service. This is a case of ongoing process of creating relationship between a new technology of advanced science and society.

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Deciding on Normality and Pathology: Self-knowledge of Adults with AD/HD

Based on interviews with adults in Germany and the US who have been diagnosed with attention-deficit/hyperactivity disorder (AD/HD) I will discuss competing forms of knowledge among patients and experts in the medical professions. At first view, most patient interviewees share a conception of their disorder and general notions of pathology and normality that go well along with a bio-psychiatric mainstream view. However, there are various instances where this mainstream is challenged. With respect to self knowledge, that is, knowledge about aspects that are intricately linked to core

experiences of personality and subjectivity, experience appeared to be a crucial component in questioning decisions by experts. Experience here not only stands for direct, first-person experience ("The drug did more bad than good") but also comes in a mediated form through different channels – support groups, internet forums and e-mail lists, or, even more mediated, through self-help books. I will discuss the consequences these findings can have for evaluating models of knowledge transfer from expert to lay communities and to what degree experience can be used as a resource of resistance against assignments of pathology. The answers to these question are rather ambiguous: being pathologized often turned out to be something desirable (disorder as explanation, access to health care resources, etc.) and the interviewees showed a high degree of a flexibility in handling of mainstream and non-mainstream views to balance the benefits and disadvantages of a diagnosis.

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Not So Cut and Dry: Nature and Normalcy in Debates on Neonatal Circumcision and Neonatal Intersex Genital Surgery

This paper will consider the arguments of scholar-activists working on two separate but related issues: first, the question of neonatal surgeries on the genitalia of individuals born with ambiguous gender-identities; and second, the question of neonatal circumcision. Genitalia serve as the site of distinction between the binaries of male-female and of Jew-Gentile. Historically, intersex individuals have threatened the sense that male and female are "naturally" defined; so too, uncircumcised Jews have historically existed in a sort of "third" category, complicating the supposedly natural distinctions marking Jews from Gentiles, as well as "brothers" from "others" and humans from animals.

In the last 150 years, both procedures have been at the center of medical and cultural debates about who has the right to define what is "normal." Activists working to stop neonatal surgeries on intersex individuals and those working to stop neonatal circumcision similarly structure their arguments around critiques of culturally imposed concepts of normalcy. In these discussions, the "natural" emerges as a reified standard of normalcy though it has been a disputed category, both fetishized and feared, worshipped and rejected. The natural is also something which people have attempted to preserve through "unnatural" means such as performance, invention and modification. Using a number of historical examples, I will examine the rhetoric of "normalcy" and "nature" on both sides of the debates about neonatal genital procedures. While the debates about intersex genitalia and about circumcision raise many overlapping issues, I am also interested in attending to the radical distinctions between these matters.

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Incorporating prosthetics into the body

In this paper I describe the process of incorporating a prosthetic limb into the body sense of a military patient, thus illustrating "ways of knowing" the extent and limits of one's body as the manufactured limb is transformed into the natural body. I draw on Maurice Merleau-Ponty's Phenomenology of Perception and his discussion of proprioception, the body's sense of itself in space and time, which he describes as the integration of the cane into a blind individual's "scope and active radius of touch." The cane is no longer a separate or distinct tool or prosthesis and instead has become incorporated into the individual's sense of their body.

Based upon an ethnographic investigation of the social life of rehabilitation among patients with amputations and their clinicians at the Walter Reed Army Medical Center, this paper demonstrates the extent to which similar processes are occurring among patients in the US Armed Forces Amputee Patient Care Program. Patients who have been enrolled in the study report experiences of the "incorporation" of their prosthetic device. For examples, as this paper demonstrates, one patient, who is a person with a lower and an upper extremity amputee, described stepping into a puddle with his prosthetic leg and having the sensation of his "foot" becoming wet. On another occasion he described his myoelectric arm as feeling "more natural" rather than "being strapped on me."

The experience of the military patient will be described through time as the patient incorporates the limb into his body sense.

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How a medical technology becomes a consumer good

Increasingly, health care, and health care technologies in particular, are being transformed into consumer goods. The automatic external defibrillator (AED) for the treatment of cardiac arrest is an excellent example of this process. From its origins as an experimental device in the 1950s, it has undergone successive transformations from a device used exclusively by doctors, to one used by a variety of health care professionals, to one used by lay people. It has now (in the UK) been authorised for sale to the general public to keep at home. Drawing on our programme of work on this device, we will show how the AED has been socially constructed and re-constructed in a variety of different ways, though the underlying technology has remained essentially the same. We will consider in detail the way in which a variety of institutions have presented it such that its most recent iteration into a domestic consumer good, analogous to home electronics, has been made possible. It is suggested that within the home context, the AED reflects wider consumer culture models of instrumental and expressive consumption; and that through

this consumption laypeople's notions of individualism and community play a part in 'ways of knowing' the AED. As well as giving our theoretical understandings of this process (using a broad STS approach), we will utilise data from the three qualitative studies we have done on the AED, including a recent set of interviews with consumers who have purchased an AED for home use

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Analysis of internet cancer discourses: infantilization and pink boxing gloves

One of three people in the United Kingdom and North America will be diagnosed with cancer. The threat it poses mobilizes a vast medical technoscientfic network, including hospitals, universities, pharmaceutical companies, governments, charities, lay support groups and individuals.

According to John Pickstone, technoscience can be seen as a way of knowing and a way of making. Late in the late 20th century, the internet, a technoscientific innovation, permitted lay persons to gaze into STM complexes. At the same time, pharmaceutical companies burgeoned.

This study analyses cancer-related internet discourses, particularly the contributions made by pharmaceutical company's cancer drug websites. It explores how websites, those ephemeral traces, changed from the beginning of the 21st century to the present. It considers which discourses were taken up and which were abandoned, how the sites used discourse to position themselves with respect to patients, what server-advantaged cancer patients and their families were faced with when they gathered information from the internet to contribute to their knowledge of the disease.

END

15.5 Ways of Performing Finance

Organizer/chair: David Martin
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The Social Studies of Finance have become a classic field within Science and Technology Studies for almost a decade. Indeed, it is a widely admitted and well documented fact that financial practices – trading, asset management and valuation, risk supervision, accounting standardization, etc. – abundantly appeal to ever more sophisticated kinds of expertises. Financial theory (so called "modern finance") has been especially stressed as a decisive performer of financial activity. It is not the only available body of knowledge, and moreover, the matter of (scientific) knowledge is always linked to the matter of action, as well as to its social and political legitimacy.

Law, Accountancy, Economics, Stochastical Mathematics, Chartism, empirical knowledges… Which are the legitimized ways of knowing among everyday financial actors? How far are each of these challenging disciplines shared, considered and implemented by actors? How far have they merged and conveyed a kind of hybrid paradigm (allowing market coordination as well as risks forecasting and supervision, for instance)? How to account for the social consistency and durability of such a practical paradigm?

Several issues will be explored. For instance:

- The political aspects of conflicts (or compromises) between diverse ways of knowing, taking into consideration the challenges issued between different professional groups and prescriptions these imply
- The historical appraisal of the modalities, the extent and even the social performance of the dominant position of "modern finance" among the other ways of performing and legitimizing financial practices.

Daniel Beunza and David Stark
Columbia Business School / Center on Organizational Innovation

Distributed Calculation: Artifacts for Deliberation in the Capital Markets

The study of capital markets is currently defined by the debate between rational choice and bounded rationality. Sociologically, both are subject to the same critique: both provide an over-deterministic, over-abstracted and asocial perspective on market action. We address these with an ethnographic study of risk arbitrage and the controversies that take place in it. Arbitrageurs, we find, operate in an environment of Knightian uncertainty. We contend that they overcome this uncertainty through a mechanism of "distributed calculation:" establishing social, cognitive, and technological associations

that allow them to estimate their missing information and debate with other arbitrageurs and calculate value.

Jean-Pascal Gond
Nottingham University Business School/International Centre on Corporate Social Responsibility

Making Corporate Social Responsibility Calculable and Legitimate on Financial Markets: The Social Construction of Socially Responsible Investment in France

The purpose of this paper is to highlight the role played by calculative agencies that turned the idea of corporate social responsibility into figures in the construction of socially responsible investment on financial markets. I rely on an in-depth analysis of the case of the entrepreneurial firm ARESE - a pioneering social and environmental rating agency in the French market - and its role in the development of the Socially Responsible Investement in France. This qualitative empirical study shows the interplay between calculability and legitimacy in the construction of a new market segment.

Matthias Kussin
Institute for World Society Studies / University of Bielefeld

Governing global banking organizations: On the significance of organizational knowledge in regulatory practices

The following contribution deals with the new regulatory approach in banking supervision which is formulated in the global framework well known as 'Basel II'. From a sociological systems-theoretical perspective and on the base of a document analysis it will be shown in how far the framework wants the supervisors not only to concentrate on financial aspects of the bank but also to focus on the bank as a formal organization. Therefore, further organizational processes, following scientific, technical, legal and other rationalities become relevant for the regulatory practices which require new forms of supervisory knowledge. Comparing Basel II with the proceeding framework (Basel I) it becomes clear that dealing with organizational facets in such an explicit way, means a change of paradigm in global banking supervision.

David Martin
CERTOP-CNRS / University of Toulouse / France Telecom R&D

Mutual Legitimization Process of 'Market' and 'Theory': the example of widespread Volatility Forecasting

This paper explains how financial actors (traders and supervisors) and financial theoreticians (Academics and "quants" in trading rooms, build a convergent way of measuring risk, by forecasting a so-called volatility. We recall how ancient financial derivatives, like options, are to better underline the reasons of their renewed practical

success (for about three decades). This success has widely been documented to be linked to the development of whole a mathematical financial engineering. Since Black & Scholes pricing model assumes "volatility" (i.e. standard deviation of asset returns) to be an exogenous parameter, the supposedly computable price of derivatives is as a matter of fact dependant on the calculation of volatility... The latter appears to be a new key value for calibration and implementation of pricing models and risk supervision.

We study the process of this Copernican revolution of (both financial and theoretical) speculation that consists in focusing on the search for the "fair" volatility. Professional and academic research on "volatility forecasting" is here studied as a central corpus of speculative action (457 papers), and supplemented with two kinds of empirical data: observation of real markets and regulatory practices, and interviews with actors. A self referential process of legitimization appears between 'market' and 'theory', which does not exclude and even require a range of alternative and complementary kinds of knowleges.

Horacio Ortiz
Ecole des Hautes Etudes en Sciences Sociales

Making stock pricing methods performative: the everyday logics of interaction of professionals in contemporary finance.

This paper is the result of a five month field work as in intern in a brokers company and about 100 interviews with professionals of the financial industry. The paper analyzes the implicit ontology in one of the major tools of stock pricing: the discounted cash flow method. It then turns to analyze how the different actors: analysts, sales, traders and fund managers relate to the tool and its implicit ontology, which structures all financial analysis about listed companies. The discounted cash flow method is supposed to define the current price of stock by discounted the future cash flows of the company. On the one hand, the mathematical logic of the method is a word-by-word description of the actualization of future cash flows, which are supposed to describe the value of a share of the property of the company. On the other hand, the method renders evident the impossibility of its completely accurate realization, since the data needed to fulfil its task is the result of an always hazardous interpretation of past events in order to define the future. These difficulties are mobilized and reproduced in the everyday interactions, collaborations and conflicts between the actors in their particular professional setting. The implicit ontology of the method of valuation of stocks organizes thus part of the everyday logics of interaction of the actors observed and at the same time is therefore made performative by them in the financial world at large.

Aaron Pitluck
Illinois State University

Moral Behavior in Stock Markets is Shaped by Mandates and Market Structure

This paper addresses the puzzle of why the inclusion of non-financial social justice or religious criteria by professional fund managers has been so popular in Malaysia and yet has had to date relatively little influence in the United States stock market, despite polls that indicate considerable interest. Drawing from over 125 ethnographic interviews with financial workers in Malaysia, this paper argues that moral behavior in high finance is shaped by two social forces: 'mandates' and 'market structure.' In both countries mandates are a weak form of social control of fund manager's behavior. This is because mandates are not principal-agent contracts but are primarily marketing exercises and cultural tools. Social investing in the United States is weak because it relies solely on mandates to communicate clients' ethical desires to their fund managers. Islamic and Ethical finance in Malaysia is strong because Islamic social movements have reformed the Malaysian stock market's structure. Specifically, a uniform interpretation of Islamic investing was institutionalized with the creation of a nearly-unique quasi-governmental body. This has resulted in an unambiguous bifurcation of listed corporations as 'compliant' or 'non-compliant,' accompanied by unambiguous rules to determine the investment universe for money managers with Islamic mandates. As a consequence of these factors, Islamic principles influence the behavior of corporations listed in Malaysia, at present narrowly, but with the potential for wider influence in future. The paper closes with implications for social investment in the United States.

Ine Van Hoyweghen
University of Maastricht

How to be Fair in Finance? Knowledging Actuarial Fairness in the Insurance and Reinsurance Business

Since the early 1990s, debates on genetic testing for private insurance have put the issue of risk selection in insurance back on the public agenda. However, many of these debates have been rather speculative and abstract. By pitting insurance principles against legal-philosophical concepts, these debates frequently end up in a deadlock. Striking is for example that many elements – varying from the so-called "insurance logic" to "actuarial fairness" are presented as givens. In an attempt to open up these debates, the present paper explores this concern from an empirical sociological angle - from within the insurance world. To this end, ethnographic fieldwork was done in the underwriting departments of international insurance and reinsurance companies. We consider risk selection practices not as abstract givens but as embedded and collectively organised devices that make it possible to reach compromises out of different justifications. Such balancing acts involve a wide array of considerations, ranging from accuracy, solvability, marketability, cost-efficiency and clients' expectations to more general company profit-making strategies. In the same vein, we illustrate how insurance principles like actuarial fairness are not static but produced along the particular, variable localised underwriting practices and regularities of the insurance market. From there, we argue that actuarial principles, like actuarial fairness or actuarial relevancy, are not sufficient for solving insurability issues; the hybrid knowledges embedded in underwriting policies colour the deployment of these actuarial principles. That way, we suggest how an empirical

philosophical analysis of underwriting may revitalise insurance markets or at least redefine the dilemmas prompted by the issue of genetics in insurance.

Jacques-Olivier Charron

Conservatoire National des Arts et Métiers/Laboratoire d'Investigation en Prospective Stratégie et Organisation

How does a market think ?

A study of market opinion in the making
Impersonation is a distinctive feature of financial markets: these are supposed to "favour" or "reject", "impose" or "influence" ideas, decisions, options, strategies… Financial media, economic and management discourses readily assume they send and are sent messages, have feelings, believe or disbelieve many things and even sometimes change their mind. Stock exchanges are supposed to think.

According to academic finance, financial markets don't think but tell the truth, they reveal the true ("fair") value of assets. Behavioral finance claims it is not always the case, due to various psychological features of market participants, but clearly admits that the true ("fundamental") value of an asset does exist: exploring biases means there is a norm. Drawing on conventionalist approach, we accept the idea that financial markets think, at least express constructed opinions. Therefore, we posit that the fundamental value does not exist, and that financial market prices only reflect opinions.

Our research aims at capturing market opinion. In order to understand its content and its functionning, we chose case studies to get a detailed account of the actors involved, their interrelations and the way they are legitimised. We investigate market opinion on four French listed firms on a 3-year period. Financial media and interviews are used to identify the relevant actors and to characterize them; we also study how market participants try on their turn to capture market opinion.

Finally, we relate market opinion to market prices and stress it requires to change the way market reaction is treated and conceptualized in what we could call the "event study industry".
The call for this panel has been a high success among international SSF researchers. So, two of the applicants cannot be mentionned in the core of the proposal. And it was too late to build a second panel:

Olivier Godechot
(Centre Maurice Halbwachs-CNRS/Ecole Normale Supérieure/Centre d'études de l'emploi) proposes a paper titled: "What's the market wage? How compensation surveys give form to the financial labor market"

Martha Poon (University of California San Diego / CSI-Ecole des Mines de Paris) Credit scoring in the USA and France.

END

15.6 Computational Co-creation of Knowing Selves and Communities

Organizer/chair: Kevin Walsh
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Elizabeth Petrick, Graduate Student, elizabeth.petrick at gmail.com, University of California, San Diego, Department of History
Jonthan Stern, Graduate Student, jonlwstern at gmail.com, University of California, San Diego, Department of Sociology

Each of the presentations will explore the dynamics of user access to computer technology, and how user perceptions and expectatations changed as their individual and community experience grew. The presentations will treat a range of computer technologies from personal computing to supercomputing, and how their respective learning experiences shaped both their knowledge of the technology and what they were attempting to know through its use.

Kevin Walsh, Graduate Student
University of California, San Diego, Department of History

The Origins of the U.S. Academic Supercomputer Centers and The Rise of the High Performance Computing Community

Five academic supercomputer centers were established by the National Science Foundation in 1985 after what has been described as a 17 year "famine" of supercomputers in universities. U.S. academic researchers in need of supercomputing often went abroad to Europe or Japan to use machines in foreign labs. To add irony to dimming of national prestige, the machines available abroad were designed and manufactured in the U.S..

The creation of the centers was spurred in large part by several unsolicited proposals from universities and commercial physics research entities. The historical context of the early 1980s included a number of factors that conditioned the NSF reception to such proposals. Such factors include: several years of reduced funding from both the NSF and the DOE, increasing economic competition from Japan, especially in technology, and expanding availability and use of computers, especially personal computing. However, demand for computing out stripped availability. Access was further frustrated by expectations and perceptions of what computing made possible for university research and scientific insights.

My contribution to the panel discussion will explain how credibility and consensus were

created and exercised by a wide range of university researchers to support the creation of the national supercomputer centers that came to serve as cornerstones of what has become the High Performance Computing Community. The theme common to this consensus was that shared access to high performance computing would lead to new knowledge and new ways of knowing, individually and collectively.

Elizabeth Petrick, Graduate Student
University of California, San Diego, Department of History

Conceptions of the First Personal Computer Developers

For this panel, I will discuss research I am conducting on the community of developers who designed and worked on the early personal computers (including the IBM PC, Apple II, and Apple Macintosh). I will explore the role this community played in determining what was considered possible for the personal computer, in terms of the uses to which it could be employed, and the users who would likely be interested in and have a use for the technology. I am interested in the social dynamic of this group of developers, how they interacted with each other and the larger burgeoning computer industry, and the values they held. Within the community, who was allowed to speak on the possible direction the technology might go? How was authority established, and were some perspectives or ideas left out or excluded as a result of the group dynamic? What was considered possible and what was not considered at all? To understand the historical context this group was operating within, I will also examine their values and relationship with ties to groups such as the counterculture movement and electronics hobbyists.

Jonathan Stern, Graduate Student
University of California, San Deigo, Deparatment of Sociology

Damn I'm Stuck! An Analysis of Game FAQs and The Knowledge Community of Video Games

In this paper I explore the knowledge community of video game players created by gamers for gamers. This paper focuses on Game Frequently Asked Questions (FAQs) and walkthroughs primarily written by video game players and distributed free online. In order to understand the value of this knowledge, I describe the origins of game strategy which arose in the hands of developers. Strategy started phone based hint lines, magazines like Nintendo Power, and hard-bound strategy guides. Even though, today gamers have easy access to game strategy in the form of FAQs and walkthroughs developers have continued to create their own "official" strategy guides. In an effort to understand the different types of information and perspectives presented in both developer and user created knowledge I analyze the distinctions in regards to specific games. The knowledge sharing of Game FAQs is dependent on the internet and mirrors other forms of web based sharing including flickr, forums, wikis, and online reviews. This paper relies on and contributes to literature from fields including the sociology of knowledge, game studies, the study of new media and knowledge specifically linked to

technology. Game FAQs provide gamers with a knowledge support structure, essentially allowing video game players to guide each other to success.

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Re-imagining the user

In this presentation I would like to explore cold war and World War II era research on 'the user.' Using JCR Licklider as a focal point, the account will touch on some of the work that was undertaken in sites such as the Psycho-Acoustics Laboratory at Harvard, Lincoln Lab at MIT, and ARPA's Information Processing Technology Office. One of the goals of this talk is to provide a preliminary history of early work on 'the user.' On another level, this presentation aims to provide a historically richer alternative to internalist histories found in fields such as human computer interaction. More generally, I am hoping to leverage work in this formulative period as an entry point for exploring a few of the larger issues and implications in conceptualizing the relation between technology and the human.

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Interpreting Technology Practice: Users, Meaning, and Agency

This paper explores how everyday users of technology, regardless of their expertise, have agency over technology's development and, ultimately, its effects. The constructivist concept of "interpretive flexibility" implies that meaning is central to technological development—-user agency is essentially an intervention into meaning, into the cultural codes that manifest in technical practices. To develop this implicit linguistic conception of social life, this paper first investigates a strain in the linguistic turn that sees social change as purely discursive, presupposing an anti-essentialism and the "arbitrariness of the sign" as it presents itself in social life. But this approach contradicts the way people experience their social world and its signifiers. Drawing from communication theory, hermeneutics, and phenomenology, this paper argues that this contradiction stems from a lack of an account of technology itself, that meaning (as a product of sign systems) and technology are abstractions of the same concrete communicative process. The problem of user agency essentially relies on understanding communication not as message transmission but as social formation that, inextricable from any technology, shapes subjects' way of knowing, their understanding of themselves and their greater social contexts. Although it puts cultural codes into practice, the practical function of a technology is not reducible to these codes. Technology use instead represents that aspect of language through which subjects may discover new experiences and meanings that, once articulated, can put dominant codes to new uses and therefore modify them. This

insight provides the basis for thinking how users' interpretive practices can manifest in technological design.

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Migrating to the Information Society; Swazi women's experiences using ICT

Within development, Gender and Information Communication Technologies (ICT) contextualizes feminist cultural studies. For Swaziland, a small kingdom in Southern Africa, gender and ICT is approached from the perspective of empowering those who have no access or are impaired by some social or other impediment. My research diffracts from this angle and instead focuses on those who are using technology, and analyses their experiences with the hindsight of enlightening future projects on how to best lure more offline social actors to migrate to the information society.

The study of Gender and Technology has produced interesting analogies that have created what theorists such as Berg & Lie (1995) call constructive tensions within gender and technology studies from a science and technology studies (STS) perspective. Theorists such as Everts Saskia (1998), Cockburn (1994) and Butler (1990) have been useful in analysing the different relationship women have with technology. Researching/analysing the gender and technology relationship from a development perspective, I have not so much focused on women being denied access due to various social impediments such as their gender role requirements, illiteracy, poverty and their social standings. I look at women who are using technology, women who are embracing ICT use, to understand the unique relationship women in Swaziland have with ICT specifically women graduates in professional jobs. It is my aim to diffract from the obvious notion of women being gendered and hence experiencing hardships because of it.

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Changes in Internet Access and the Scientific Career Across Time: Evidence from Ghana, Kenya, and Kerala, India

Much excitement has surrounded the potential of the Internet to connect researchers located in less developed areas with those in the developed world, altering their network structure in significant ways. Some, moreover, hypothesize that the potential change in network structure associated with Internet use will have a further impact on career outcomes such as increasing productivity and creating an environment that is, in general, more favorable to the research endeavor. The minimal evidence available, however, has presented a mixed picture regarding the validity of these claims. While email and

Internet access are indeed increasing in many less developed areas, the outcome of this trend in terms of professional network structure and productivity are not unequivocally in the direction hypothesized. Much of the previous research, however, has examined these questions at one point in time, capturing Internet access and use and network structure at a single moment. Because of the dynamic nature of social networks and because Internet dispersion is still in progress, a more appropriate approach to these questions is the one proposed here. We propose to examine the changes in scientists' access to the Internet in Ghana, Kenya, and Kerala, India using panel data. By examining shifts in Internet access and use, network composition, and professional outcomes over time, we address the weaknesses of previous research and provide a more nuanced account of the career changes of scientists in less developed areas.

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Learning portal as boundary object between centralized objectives and local needs
This abstract is based on an article that is currently in review and considered for publication in Nordiske organisasjonsstudier (organization studies in the Nordic countries).

It represents a challenge to all large and complex organizations to establish local ownership to decisions, strategies and products at the same time as a common belonging to the organization and common objectives is established. Based on semi-structured interviews, I am looking into how a large Norwegian oil company (Statoil) introduces Learning Management System (LMS), a learning portal, and at the same time the organization of internal competence development in the so called Statoil School of Business and Technology (SBT) as tools to contribute to solve this challenge. I use the concepts boundary object and community of practice as an analytical framework to illustrate this problem, and to clarify what purpose the informants want LMS to serve in Statoil. LMS as a boundary object can be used to translate between departments, and from centralized objectives and strategies to local communities of practice. In Statoil, the wanted function of LMS as boundary object is as a mediator and as a tool for closeness and community. I claim that boundary objects can function as both theoretical, analytical tools for researchers in the field, as well as concrete tools for organizations and institutions that are supposed to cooperate across perspectives and points of departure.

END

15.7 Social Studies of Biology and Evolution
        Chair: Banu Subramaniam
        Presenters: Banu Subramaniam, Ullica Segerstrale, Julio Muñoz-Rubio, Kuo-Hui Chang, John Parsi, Bonnie Green

Banu Subramaniam
Women's Studies, Univ. of Massachusetts, Amherst

Knowing Me, Knowing You: Narratives of genomic similarities and differences

A recent Time magazine cover featured a chimpanzee and a human baby with the title, "How we became human." The cover page further explains, "Chimps and humans share almost 99 percent of their DNA. New discoveries reveal how we can be so alike- and yet so different." This paper juxtaposes two sets of literatures – the human genome project and environmentalist discourses against GMOs/transgenetics. The human genome project has been used to tell multiple stories. In particular, stories of how closely we are related to chimpanzees and indeed genetically to all organisms – positing a kinship of all life. Others have focused on the small genetic differences to narrate racialized stories of who we have become. The second literature against the development of genetically modified organisms develops multiple critiques of why we must not tinker with genomes, often positing the incompatibility of different genomes as well as their fragility. Questions of what it means to be human/animal/plant animate both sets of literatures.

 A lot is at stake in these narratives – visions of global kinship, of genetic kinship with animals and plants versus visions of human uniqueness and exclusivity. This paper attempts to read these two bodies of work to examine competing discourses of knowing the "human." How do we know who is human? Who is related? How and why?

Ullica Segerstrale
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Knowing by Feeling - Empathy as a Tool in Science

Anthropomorphism has typically been under suspicion in science. A type of "disciplined anthropomorphism" underlies the idea of optimization strategies within Neo-Darwinism. In these mathematical models individual organisms are presumed to act as if they were maximizing an entity: their "inclusive fitness". A "gene's eye's view" sees the gene rather than the individual as the strategic actor. Although for someone like Richard Dawkins the "gene's eye view" is a pedagogical tool, for W. D. Hamilton it was a methodological tool with epistemological overtones. For him, statements such as "If I were a gene, what would I do?" or "If I were an Ebola virus, how would I make myself spread most efficiently?" involved a deep identification, an expanded type of empathy. We are dealing here with unabashed anthropomorphism, one of Hamilton's signature tools. His empathy with all nature's creatures: plants, insects, even parasites in his own body, was instrumental for his theory building. He felt the altruism of the stinging bee

saving its kin. He laughed with trees and cried with asphalt flowers, kept company with beetles, and pitied monstrous-looking wingless fig wasps. For Hamilton, nature was animated, full with signals, and he was their interpreter. Hamilton's mathematical models were informed by his deep anthropomorphism, but their validity was independently assessed by others. To an astonishing degree, his theories of inclusive fitness ("kin selection"), parasite avoidance explanation of sex, and many others, have prevailed and opened up ever new research industries.

Julio Muñoz-Rubio
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Evolutionary Aesthetics and the Capitalist-Patriarchal Control of Human Bodies.

Evolutionary Aesthetics is a good example of an explanation in which a field and a way of knowledge are abusively introduced into another qualitatively different one.

This field of knowledge postulates that human attractiveness is the result of a process of adaptation explained by the Darwinian principles of natural selection, and that beauty is a faithful indication of youth, good health and parasite resistance. Hence, it reduces all evaluation of human beauty to reproductive and survival needs, all of them translatable to the physicalist language of magnitudes. Passions, erotism, culture and human subjectivities are eliminated from its explanation.

In this paper I criticize these biologicist thesis because they utilize an unfalsable, vague, speculative and imprecise discourse. Evaluation of aesthetics in humans acquires a questionable functionalist and efficientist overtones proper to capitalist-patriarchal society.

In this reductionist model, what actually is an intromission of the above mentioned patriarchal-capitalist laws into human bodies, are conversely represented as if they were the result of a natural, genetic-determined internal impulse. What actually is an attempt of an ideological, "scientific" control of human bodies is falsely represented and forced to be known as being a natural behavior tending to increase biological fitness.

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On the Continuity of Human Evolution in China: Constructive Explanations Based on the Scientific Evidence

The issue of the continuity of human evolution in China is still raising a controversial debate. Two rivaling theories, the "recent out-of-Africa" and the "multiregional," claim their validity in explaining the issue and exclude one another. The former theory also

known as 'replacement theory' or 'Eve theory' suggests that all modern humans are descended from a common ancestor who lived in Africa and whose descendants migrated to Asia and Europe, replacing existing human population. This theory claims that Peking Man (Homo erectus pekinensis) who lived circa 500,000 years ago in current China was replaced by Home sapiens out of Africa circa 100,000 years ago.

The multiregional theory is that a worldwide network of genetic exchanges, between evolving human populations that continually divide and reticulate, provides a frame of population interconnections that allow both species-wide evolutionary change and local distinctions and differentiation. Different than the theory of recent out-of-Africa, multiregionalists assert that Peking Man was the ancestor of the modern Chinese.

I will explore of how both camps strengthen and eschew on some scientific evidence to support their theories, and then will assert the interpretation of scientific evidence is a sociological process and consequence in paleoanthropology. The constructive interpretations of paleoanthropology would be hardly removed from the issue of the continuity of human evolution in China. This paper's goal is to explain that natural knowledge is being theorized by scientific evidence, social factors in the Chinese nexus and the constructively essential of paleoanthropology, which I am going to explain, simultaneously.

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Sex as a Standardized Package

Western societies are dominated by a dimorphic view of sex, a view that identifies only two appropriate sex categories—man and woman. The dimorphic view is arrived at through a convergence of science and policy. From our bathroom stalls to our sporting teams categories of "man" and "woman" dominate individuals' interactions. Policy-based separation of the sexes stems from the belief that a dimorphic standard of man and woman is a natural, and hence appropriate, method for ordering human life. This dimorphic view encompasses not just sex as a biological category, but also gender as a social category. The purpose of this paper is to examine how the formation of a dimorphic view of sex has become the dominant view in Western societies.

Studies of intersecting social worlds in the construction of new knowledge have produced two concepts, reflecting diverse but conciliatory explanations for the production of interdisciplinary knowledge: boundary objects and standardized packages. After engaging in a theoretical debate about these two methodological perspectives, this paper examines sex dimorphism through the social worlds of philosophy, medicine, law, and psychology, all contextualized by changing technologies, to demonstrate that a convergence of sex and gender in its dimorphic conception does exist and that it has helped to create and cement a standardized package of this interdisciplinary understanding. Ultimately, this paper categorizes sex dimorphism as a hegemonic

standardized package because of the scope and intensity of the application of sex dimorphism as a policy category.

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Automating Actions, and the Morphicity of Basic Biotechnologies

While many contemporary biotechnologies continue to occupy controversial positions within society, for example GMO's and human embryonic stem cells, other, more basic technologies, are in routine use in laboratories throughout the world. Within STS many such tools and techniques have been characterized in terms of practices, protocols and embodied actions (eg. Rabinow, 1996; Jordan and Lynch, 1992, 1998) which, despite standardization, incorporate the skills and local knowledge of human practitioners. The paper extends this model, and offers a systematic analysis of three, increasingly automated, forms of the plasmid mini-prep. Drawing on Collins and Kuschs' (1998) Theory of Action Morphicity, which provides a framework for analyzing the same action carried out in different ways, the paper compares the "home brew", kit-based, and fully automated versions of this procedure. It suggests that each version involves the same series of steps, though ones which are progressively delegated to machines. While this could be seen as part of the 'deskilling' of laboratory scientists, the paper suggests that the shift towards the fully automated form of the mini-prep does not involve a reduction in the skill required by laboratory researchers, rather it implies a shift from one skill set to another.

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Ways of Knowing Microbes

As Latour showed us in his work on Pasteur, the identity of microbes is a negotiated process. This continuing process is reflected in the pages of popular and technical scientific publications where authors debate ways of contending with multi-drug resistant disease organisms or the health benefits of diverse microbial flora. Long standing medical and public health commitments to a "contain and control" approach to pathogens are recently being questioned in the face of continued food safety incidents, growing bacterial drug resistance and new technologies redefining pathogenic behavior of microbes. One policy arena in which different, and conflicting, microbial identities are being discussed is in the implementation of U.S. federal organic standards on composting. Concerns over food safety have led to restrictions for organic farmers on the uses of compost and compost teas, which farmers have relied on in managing soil fertility. This paper examines the technologies of different ways of knowing microbes

and discusses the implications of the broader, underlying discursive framings of microbe-human relationships. The continued elaboration of ecological, economic, moral landscapes that we cocreate with the non-human world is argued for. A vision of "natural" objects -- animals, and yes, even microbes -- as knowledgeable agents is key to this process.

END

15.8 Magic, Religion, and Science
    Chair: Deborah Blizzard
    Presenters: Deborah Blizzard, Yaki Menschenfreund, Devon Elliott, David E. Long, Michelle Corbin, Julie Homchick, Stephen Petrina, Palecek and Konopasek, Thorvald Sirnes

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Cultivating Magic

We are an ever increasing culture of scientism: nanotechnology, cyborgology, and information technologies are but a few examples of recent additions to "normal" life and what "we" know to be true and possible. While the rationalism of science and science-based technology is further entrenched into the cultural milieu, ironically so is magic. It is not difficult to find contemporary images of magic in Western cultures with the emergence of such personalities as David Blaine, books including the "Harry Potter" series, and movies such as The Illusionist. Further, some retail shops, most vividly among them the high-end lingerie boutique, Agent Provocateur, are literally capitalizing on magic to sell their products This paper examines why and how magic has emerged, or re-emerged, as an important locus for Western imagination and thought in the 21st century. We will be examining how the rising popularity of magic transforms popular expectations about what is possible in everyday reality, and how that transformation converges with the transformation in expectations that derives from changes in contemporary technologies.

This paper utilizes cultivation theory to examine how widespread images of magic create the context for the normalization of its existence within what was once the province of ontological scientism. To examine this cultural development we juxtapose scientific rhetoric of rationality and objectivity with the fantasy and illusion of magic to find that in practice neither are clearly distinct.

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The Construction of Alternative Knowledge: The Case of Popular Kabala in Israel

In this paper I would like to address the social dimensions of "alternative knowledge" by reviewing one instance of the construction of such knowledge. Specifically, I would like to analyze the rhetoric of the advocates of "popular" Kabala (designed for and delivered to mostly secular audiences) in Israel in order to show how some of the mechanisms of the legitimization process of alternative knowledge work. The advocates of kabalistic knowledge employ two main strategies: First, they use scientific knowledge in order to

show how it supposedly subverts against itself and to show the alleged contradictions embedded within scientific discourse; second, they use kabalistic texts in order to show how these contradictions vanish if some basic tenets of kabala and religious discourse are embraced. These strategies are not unique to kabalistic discourse, and can be seen in a wide range of alternative knowledge systems. However, the kabalistic manipulations of both science and religion have some essential features that are special to this case, and will be addressed in this paper. Interestingly, the purpose of the advocates of Kabala is not to annihilate science or to deem it useless or unwarranted (as is the custom in many other instances of orthodox religion in Israel), but to "correct" it so that it fits better within the ideology of popular kabala. I will argue that the construction of popular kabalistic knowledge is based on the abuse and distortion of both science and traditional (orthodox) kabala, by symbolically violent methods taken mostly from New Age discourses.

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Spirit Theatre: The Role of Entertainment for Spiritualists and Skeptics in the Nineteenth Century

This paper examines the role of entertainment in the public discourse on Spiritualism at the end of the nineteenth century. Spiritualists and skeptics both held pretensions of a higher purpose to their efforts: an engaging religious experience on the one hand, and a worldview based upon reason on the other; however, both camps were also engaged in theatrical presentations to be consumed as entertainment. For members of the public entering this debate, causation was unclear. Entertainment provided an avenue to inform a mass audience, through which some would come to know enough of the topic to choose a side between the skeptics and the Spiritualists. Introducing consumer elements into the representations of the movement complicated how opinions about Spiritualism were developed in the public sphere. At the same time, entertainment also opened the door to other avenues of public discourse, including print media and the courts. The convergence of the attitudes of all of these cultural authorities ultimately directed the public attitudes regarding Spiritualism. An 1894 case study from London, Ontario, Canada, where a professional medium and her manager were brought to the city by supporters but were quickly confronted by skeptics, will be used to illustrate the actors and social mechanisms in this process.

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College Student Practice and the Symbolic Violence of Evolution

Biological evolution as an idea continues to be a point of contention within the United States. At the university, evolution is part and parcel of the scientific curriculum. The

receiving end of this curriculum, however, is a larger body politic of students who bring with them varying dispositions, values, and attitudes toward science. This scientific cultural capital often includes an American cultural trait of skepticism toward evolution. Essentially, the cultural capital of the university scientist and the university curriculum are often at odds with dearly held facets of student epistemology. Specifically, those students who have an epistemological grounding in fundamentalism will find that certain parts of their required curriculum generate cognitive dissonance of an order which there may be no mutual accommodation. In this, the concept of evolution, as presented in the university curriculum, is a form of symbolic violence of which some students will find no other solace than avoidance.

This paper describes an ethnographic study of interactions between students and faculty in a required university biology course. The course is part of a broad liberal studies program at a large, state-funded institution in the United States. Through participant observation, class case studies, and interviews with students and instructional staff this research attempts to unpack the relationship between evolution and the American student as it plays out in the contested terrain of the college classroom.

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Crazy Wisdom: Resisting the abnegation of the possible with the inconceivable

In order to trouble the abnegation of what is possible which occurs with dominant ways of knowing, one must take subjugated knowledge seriously. This means that knowledges that are deemed 'crazy' are likely the best places to look. Those locations that are inconceivable inside the logics of domination may speak to the limits of that domination. For this project I examine two locations of, in the language of mystics, 'crazy wisdom' in order to see how they inform never-complete and never-innocent resistance. One location is the spiritual/mystical communities that emphasize higher consciousness or mystical consciousness infused with politics as a pathway of resistance. Many mystical traditions pursue altered states of consciousness with the deliberate intention of subverting the colonization of knowing. A second location I take seriously in order to push the boundaries of domination via acceptability is the psychedelicism that emerged out of 1960's LSD experiments. Western science, a dominant knowledge if there ever was one, often rejects 'mystical' or spiritual discourses as so much primitive hogwash. However, given the laboratory trappings surrounding LSD, it was not so easily rejected. This meant that science actually grappled with the questions that arose from these subjugated, 'drug addled' experiences which were often very similar to the mystical experiences pursued by spiritual disciplines. Engaging these knowledges that show up as 'crazy' on the dominant radar allows one to ask about the role of knowledge and states of consciousness in the always interpenetrating and non-resolvable relations of domination and resistance.

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Rhetoric, Epistemology, and the Intelligent Design Controversy

The controversy over evolutionary theory has been a long and complicated one. This paper will examine the most recent reaction to evolution – intelligent design theory – in comparison with defenses of evolution. In many ways, the writings and claims of both evolutionists and intelligent design theorists appear to be similar in their ways of knowing and understanding the natural world. They both purport to use methods of scientific investigation and they both purport to rely on scientific norms. Since evolutionary theory is considered scientific by the scientific community and intelligent design theory is not, how is it that they are epistemologically distinguishable if their investigations of the natural world appear in many ways to be similar? In order to answer this question, this paper will further investigate how each side makes knowledge claims. This will reveal any distinctions between these seemingly similar ways of knowing. To follow this, what each side claims to know will likewise be investigated to further illuminate any distinctions.

This study will be accomplished by using the methods of rhetorical criticism and will refer to Robert Merton's norms of scientific practice. The analysis will primarily focus on two key figures within this controversy: Evolutionist Richard Dawkins and intelligent design theorist Michael Behe. Each authors' scientific and public writings will be analyzed and compared for their rhetorical and discursive strategies that shape their claims about how and what they claim to know.

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Technology, Religion, Spirituality and the Sacred

How does the technological enter into the spiritual? How does the spiritual enter into the technological? Or is it already there, as Latour contends, preserved in premodern consciousness and cosmology, always already manifest? Conventional, specialized treatments of technology, religion, spirituality and the sacred allow for in-depth exploration but do not account for recent transformations. For example, in Theology and Technology, Mitcham and Grote (1984) map their subject according to Historical Theology, Creation and Nature, Pastoral Care, Environmental Ethics and Religious Bioethics. Jones and Mathews' (1990) have similar shortcomings in their "Taxonomy of Technology and Religion." In the Philosophy of Technology, Ferré (1988) maps

technology and theology through Judeo-Christian ethics, which range from embrace to rejection and caution in relationships with technology. This approach to the topic is conventional in that the unit of analysis is theological in its sentiments toward technology. Accounting for cyberspace, Bauwens (1996) maps "Spirituality and Technology" as The Wisdom Tradition, The God Project and Electric Gaia but generates shortcomings as he addresses voids in earlier mappings. Hence, we acknowledge a new imperative for re-mapping of technology, religion, spirituality and the sacred rooted in what Heidegger and Arendt might call our techno-onto-theo-eco-logical condition. We mapped this condition to encompass technopaganism, transcendental materialism, technosecularism, technoexistentialism and technosectarianism. There are various dimensions to the map, indicating coexistence, continuities and continua rather than oppositions. Our presentation is generative, providing an overview as well as in-depth analyses of specific trends accented through new media and a backdrop of images and sounds.

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Treating spirituality. Border work in psychiatric and pastoral practice.

In our ethnographic research on spirituality in psychiatry we focus on cases of people (be they worshippers or not) experiencing some supernatural voices or revelations. We ask our data questions such as: How these persons and their experiences are treated by psychiatry (or by pastoral work)? More specifically, for instance, how it came, in terms of situated practical action, that a man, who had met Jesus and God and felt condemned by them, was diagnosed as schizophrenic? How it came that a woman who had heard the voice of Virgin Mary, with all its physical qualities, was told by a priest that it was only an "inner" revelation, "a voice in her heart"? How it comes that clerics may refuse to talk over divine experiences with worshippers, or send them right to a psychiatrist? It seems that both in psychiatry and pastoral practice interesting border work is being done. For instance, spiritual experiences are translated into a diagnosis or rephrased into more a moderated form, which need not be officially testified by the Church. Therefore, it is not easy to maintain the spiritual dimension of patients' experiences at stake. E.g., in settings such as psychiatric hospital, manageability of an illness is based on medical reports shared by the staff, on dishing medicaments out etc.; it is not so much based on talking about personal psychotic / spiritual experience. In the paper presentation, we will introduce several brief and sketchy examples that illustrate practical performance of such translations.

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The Meaning of life - Religious discourse in the science and politics of human biotechnology

Globally there has been a vitalization and strengthening of the religious dimension during the last decades, world religions have gained a new momentum and are attracting new followers on a global scale. This revival of religion also includes a reconfiguration and restructuring of religious space and its relations to other dimensions in culture and society.

One area where religious discourse has gained a particular stronghold is in the science and politics of modern biotechnology. In the modernisation literature, science is often thought of as the globalising and modernising force par excellence, while religion is seen as a local and tradition-centred phenomenon, bound to wither away under the pressures of modernisation. However, this equation of modernization with rationalisation and disenchantment is fundamentally challenged both by religious revival and by the developing new technologies of life. Human biotechnology moves right into the centre of the above process because of its affinity both to severe diseases and the non-instrumental aspects of life. The problematic of de- and re-enchantment acquires a particularly sharp form, producing many heated controversies, within this field. But the division may not at all be clear-cut. The discourse of hope both accompanying and driving developments within human biotechnology, may be seen as a secular variant of Christian salvational beliefs, promising a medical heaven - not in the hereafter, but on this earth, and not in a millennial perspective, but within ten-twenty years. In this paper, we investigate how religious meaning-dimensions are forming and being formed by developments in human biotechnology.

END

15.9 Communication, Publics, and Science
    Chair: David Caudill
    Presenters: James Weber, David Caudill, Morten Andreasen, Dirk Verdicchio,
    Petra Lucht, Arild Boman, Yoshiko Saitoh, Annamaria Carusi

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Translations, trading zones, and boundary issues:
How do people try to meet their needs for science information in face-to-face
communication?

It is commonly held that the nonscientist-public's understanding of science is flawed by
self-interest, misconceptions of risk, and the media's unintentional misrepresentations
through misplaced emphases and exaggerated conflicts. The picture painted by studies
and commentaries often shows a public driven by irrational fears and knee-jerk reactions
to science information. However, scrutiny of nonscientists' constraints in understanding
need not be limited to hot-button topics or media reactions. From a nonscientist
perspective, scientific information, like geopolitical or economic information, needs to be
interpreted, i.e., placed in context, compared to experience, and weighed for plausibility
and applications to one's own life. In an attempt to bring the nonscientist public out of
their role as frequent objects of study or blank slates resisting information, our study team
brought together members of the public and scientists to discuss a topic in basic research
– one that had not yet hit the airways in prime time. We invited participants in focus
groups to discuss the feasibility of using bioremediation for radioactive contaminants in
soil and groundwater. The discussions were facilitated but otherwise loosely structured,
encouraging as much informal interaction as possible. Although language usage and the
social interests of various groups divide people, language-usage patterns also show
evidence of some predictable ways in which people create openings for mutual
understanding. To work out and test their understanding, they used a repertoire of
techniques that included three methods of trying to achieve mutual understanding that
were recurrent and notable. These methods can be characterized as a)translation, b) the
creation of a virtual trading zone, and c) the identification of common issues at the
boundaries of their areas of expertise.

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Images of Expertise in Trial Movies

Much has been written about both images of law and lawyers in literature and film (e.g.,
Law & Literature Studies) and images of science and scientists in literature and film (e.g.,

Literature and Science Studies), but I want to consider the hybridized images of scientists in the courtroom, typically as expert witnesses. In recent trial movies, there is no single image of expertise; sometimes the expert is presented as the messenger from the stable world of science who can stabilize the contested, rhetorical world of law, and other times the expert is presented as part of law in the worst sense--biased toward a party, bought-and-paid-for, and "merely" rhetorical; and there is a third image of expertise as a pragmatic enterprise that is neither idealized nor dismissed as advocacy. Using examples from recent movies, I will identify some images and analyze them (i) in the context of the various discourses and debates concerning science in law, and (ii) in terms of the theme of the conference, insofar as these images represent different ways of knowing, some of which are valued more than others and some of which are considered unscientific, as well as the translation of scientific expertise into legal contexts.

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A sense of truth - on the seductive qualities of the deficit model

Exploring the construction by non-experts of the epistemic status of their own, of other non-experts and of experts' claims constitutes a way of investigating the public understanding of science. The finding of the deficit model as a widely shared discourse among non-experts challenges the orthodoxy within STS of describing the deficit model in terms of expert rhetoric or as an analytic paradigm. It poses the more general question: what is so seducing about deficit thinking?

In this paper, with inspiration from recent sociological work by Boltanski and Thévenot, it is suggested that the answer to this question is that expertise embodies a general hope for equivalence. In the context of re-convened "deliberative" focus groups about the patenting of human genes, examples are given of the "sense of truth" displayed by non-engaged non-experts allowing them to continually police the boundary between objectivity and non-objectivity as a way of ensuring neutrality. To this end, expert knowledge takes on a central role. It is shown that an "uncritical" expert discourse, well portrayed in the deficit model, exists along with a more critical discourse. It is suggested that the act of accepting expert assessments "uncritically" constitutes an act of reason in the same right as that of approaching science critically. The tenet of the "uncritical" discourse, it is suggested, is that expertise facilitates community; it represents a hope, shared by experts and non-experts alike, that reason may bridge our ideological differences and foster common ground for collective decision making.

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What's at stake in popular science films?

The medium film is an established means for the popularization of science and technology. As before in the first proto-cinematographic pictures of Eadward Muybridge and Etienne-Jules Maray, the human body in motion appears to be especially fascinating today. Popular science films like The Human Body, The Inner Adventure, or The Alchemy of Love attract a large audience by showing many aspects of the human body.

In order to understand the specifities of filmic representations of science and technology, it is necessary to consider the characteristic features of film as an audiovisual medium rather than only focusing only on the displayed contents. This includes to take into account that film originates from science and is still applied in scientific research. By analysing popular science films on the human body, I raise the question of the impacts of using a technology designed for visualising the invisible for the popularization of science and technology. Drawing on concepts of film theory and STS I argue that the popularization of science by films, mediates, apart from scientific knowledge also the notion of scientific testimony and objectivity. This means that popular documentaries dealing with the human body do not only communicate the results of scientific research. Due to the insights, the spectators are getting of the human body that is potentially his or her own body, s/he adopts the scientific view on her/himself and the world which relies on the mediation of visualizing apparatuses.

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Science fiction as discursive arena for "Boundary Work"

Recently, the science fiction genre has been shifted a bit more into the focus of science and technology studies as an area of research. The genre has been discovered relatively late in STS despite a long lasting tradition of integrating narrative elements, strategies, or topoi of science fiction into scientific and public discourses. At the latest since the beginning of the 20th century, scientific research and developments have been commented on by science fiction literature and movies in popular culture. In turn, science fiction enhance public debates about where lines between science and non-science should be drawn with respect to new fields of research in the past, present, and future. Among other features the genre might be characterized as follows: The narratives portray multilayered boundary drawings, boundary crossings, and boundary blurring between established scientific knowledge and fictionalized versions of scientific knowledge. The narrative trick of science fiction is to tell a story in which established scientific knowledge and what does not count as scientific knowledge has become intermingled in various and undistinguishable ways. In my paper I argue that references to science fiction in scientific and public discourses should be integrated on a broader basis into social studies of science and technology. As an analytical tool to investigate such occurrences, I propose to view science fiction as a discursive arena for »Boundary Work« (Gieryn 1995, 1999). In my paper, I will rely on case studies about nanotechnology and time machines.

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Integration, Resistance and Retraction in Youth Cultures

Knowledge, references to nature, society and culture provides basic premises of personal and social life and existence. To the extent that knowledge depends on socio-cultural or other conditions, variations like within and between societies generate differences in types of knowledge. Such types may be incompatible and thus irrelevant to each other. To the extent that they may be interrelated, or that the very registration or existence of another type of knowledge affects or threatens a given type of knowledge, problems of coherence, conflict, cooperation arise. Different types of knowledge may be kept apart or interrelated by socio-cultural structuring. These may be complex patterns, varying in degree and generality between societies and cultures. For the members of societies such structures may provide platforms or habits of interrelation, integration or disintegration of ways of knowing.

The paper applies such a structural dimension to the analysis of data on youth orientations towards different types of knowledge: science, technology, religion, art, etc. The study has been carried out with youth groups from countries like Brasil, Nigeria, Malaysia, Nepal, Norway, USA. The paper discusses several models of how the youth groups with various social, cultural, religious, ethnic backgrounds, etc., cope with knowledge type variations. The patterns may differ from totally isolating such types from each other, to attempts to mix them together into one amorphous type of understanding, ordering them in strict hierarchical patterns, etc. The relevance of such patterns to socio-cultural dynamics in their societies, and to possible further exposure to, resistance or retraction from future globalization and flows of knowledge types, are discussed.

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A case of NANTEN relocation: successful "citizens' patronage towards science"

Public engagement in science and technology is a key issue of today. But it is discussed and practiced mainly in the context of decision making or assessment on emerging technologies which applied sciences produce. So, less stress is being put on public engagement in pure sciences. Still, pure sciences are financed with tax paid by citizens. Do citizens know that they play an important part in scientific research system? Perhaps, they don't. Then, are there any means for them to see it? Or, how can they get involved more directly in scientific research?

In Japan, there is one paradigm case which might answer to the questions above. In

1990s, a radio telescope "NANTEN" of one small laboratory in Nagoya University was relocated to Chile with much financial and non-financial support from over 600 citizens. To clarify conditions for successful "citizen's patronage towards pure sciences", we studied this case through document analysis and interviews. Our working hypothesis is: the concept of "citizens' patronage towards science" can set clear goals of the science communication skills both on researchers' side and on citizens' side.

The presentation will report some findings from semi-structured/autobiographical interviews and a questionnaire survey of citizens, focusing on how they were motivated by the mutual communication with researchers.

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Trust in Internet-enabled Science

The scientific programmes of research that are emerging with the development of Internet-enabled computational instrumentation are highly complex socio-technical systems. The computations in question are embedded within collaborative and often cross-disciplinary or cross-sector relationships in their design and development as well as in their use. In designing and developing the resources, scientists of various disciplines collaborate with at least one other discipline: computer science. In addition, in using the resources, they often either need to rely on the data of others, on the co-operation of others to carry out some of the tasks required for the research, or on the active participation of others in the analysis and interpretation of their results. These are not 'added extras', but are rather social dimensions of scientific practice built into the technologies. The technologies for carrying out science become a focal point, around which key relationships (among researchers, between researchers and data subjects, and between scientists and policy-makers and the public) are clustered. Expectations and strategies of trust are being considerably challenged by these technologies and the different inter-subjective and social arrangements that they make possible. Scientists using these computational resources need to have trust in the techniques used by others, trust in the data of others, trust in the computations themselves and in those who designed the resources for carrying them out, and all of this in the context of reliance on hardware and other artefactual structures.

In this paper we describe challenges for conceptions and practices of trust that have emerged from contexts in which Internet-enabled science is being embedded, and consider some of the strategies that have been employed.

END

15.10 Sound, Visualization, and Senses
    Chair: Amy Metcalfe
    Presenters: Amy Metcalfe, Christian Dayé, Robert Olivo, Danielle Chabaud-Rychter, Thomas Staley, Stefan Bargheer, Andrew Syder, Kathryn Vignone, Eric Conrad

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Visualizing Science Studies: Photography as Subject in the "Images of Academic Science" Project

Building upon the work of Barthes (1982), Becker (1981), Benjamin (1968), Bourdieu (1965), Eco (1976), Foucault (1972, 1977), and McLuhan (1964), social scientists are creating an interdisciplinary approach to the examination of visual data (see Banks, 2003; Hamilton, 2005; Pink & Kuri, 2004; Pole, 2004). This emerging body of scholarship combines an understanding of non-verbal symbolic communication from art history, aesthetics, and semiotics with the empirically-driven inquiries of social relations from sociology and anthropology. Although the use of visual evidence is common in the sciences, the study of science is rarely associated with imagery beyond its use as illustration for text (for exceptions see Jacobi & Schiele, 1989; Knorr-Centina & Amann, 1990). This paper discusses the visual research methods utilized in the "Images of Academic Science: Photographic Evidence of Scientific Research at the University of British Columbia" project, where I have examined how photography has been used to "tell the story" of science at UBC for almost a century. Unlike the work of architectural historians that pertains to university laboratories (which is scant, but includes Crosland's 2003 description of the chemistry lab in Oxford), I am not only concerned with stylistic precedents to understand the look of science facilities, but am also interested in the social contextualization of the act of taking photographs of university science facilities. The paper discusses the scope of the "Images of Academic Science" project, focusing on the use of visual research methods as a viable mode of inquiry for the social study of science.

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Interdisciplinarity in the making – how expertise is negotiated within groups developing sonifications

Sonification refers to data-driven sound synthesis that is designed to make specific features within the data perceptible. Patterns, structures, regularities within the data are explored by listening to an auditory representation as an output of a program running on a personal computer. Artists and scientists engaged in the theoretical and technological development of this approach to data exploration have by now recognized the importance of interdisciplinary collaboration: cognitive progress by (and thus: of) sonification can

only be achieved by a common effort of expertise in a variety of fields. rogramming skills, experience with (digital) audio synthesis, knowledge of psychoaccustics is as necessary as profound knowledge of the data in question (and the ability to anticipate whether auditory display of the data helps answer scientific questions).

On the occasion of a international workshop on sonification, participants with different background came together to develop sonifications in a group setting. The discussions were audio-taped. Based on qualitative and quantitative analysis of these discussions, I will discuss how expertise was negotiated within the groups. Further, by relating my findings to concepts of interdisciplinarity found in literature, I will reflect on how interdisciplinarity should be organized in comparable settings. Finally, I want to present a sonification of the data I used for this analysis.

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'Serato would be cool if…':

The Domestication of Serato Scratch Live by Hiphop Deejays
Integrating new technologies into everyday life is a multidimensional process that requires the adaptation of technologies to existing practices, but also adapts those practices to new technologies. When this integration has become 'successful', the technologies no longer seem foreign, and are hence no longer an object of inquiry. In such cases, the technologies are said to have been domesticated. Hiphop deejays have, since the 1970s, established sets of practical, symbolic, and cognitive practices with the phonographic turntable and vinyl records that are intimately intertwined with the production of Hiphop culture. The introduction of a new type of digital deejaying technology called Serato Scratch Live poses a challenge to the identities, tacit knowledge, and social practices of Hiphop deejays. By drawing on extensive ethnographic interviews with deejays and other individuals involved in the Hiphop deejay community, this paper explores the processes by which Hiphop deejays domesticate Serato Scratch Live. I place particular emphasis on both the disruptions and continuities of Hiphop deejay ways of knowing, meanings, values, practices, knowledge, identities, and social relationships, especially as both rooted in the history and emergence of Hiphop culture and related to the use of Serato Scratch Live. Further, the framework of domestication is proposed as a valuable alternative to dominant theoretical frameworks in STS, especially for studying the use of new technologies from a user-centered perspective.

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Writing standards for sensory analysis methodology

Sensory analysis is a set of procedures and practices which aim to describe and measure human beings' sensory perceptions. It was first developed in the food industry to measure sensations related to taste. Nowadays, the design of all kinds of products tends to take into account the range of sensory perceptions through which the users relate to the products. Therefore, the French agency for standardization (AFNOR) set up in 2001 a new committee working on "The sensory characterisation of materials". I have observed the work of this committee from the start.

It is composed of representatives from companies, sensory analysis laboratories, consumers, etc... The committee works at establishing convergence between these actors' different ways of knowing sensory analysis, so as to produce by agreement a text prescribing the one best methodology. I will give several examples of the ways in which consensus is achieved.

The standardization of methods and procedures aims at stabilizing them and making them accessible to all the interested actors. The standard is a tool for regulating relationships between actors, like manufacturers and suppliers. Its circulation universalizes the methodology it recommends and de-legitimate other possible practices. These normative functions entail specific forms of writing.

Following the committee's work throughout the process permits us to show how this work disappears from the final text. A normative text does not reveal the divergent strategies, controversies and negotiations from which it is issued. Writing a standard means blackboxing it.

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Knowing by Smell: A Silent Language of Scent in the Natural History of Carl Linnaeus

In 1754, the natural historian Carl Linnaeus published – as a thesis to be defended by one of his students – a classification scheme for botanical odors. This paper outlined seven 'primary' types of aroma that Linnaeus believed were analogous to the three primary colors of visual experience. By proposing such an organizational scheme for the human experience of smell, Linnaeus effectively asserted an equivalence of this putatively primitive mode of sensation with the supposedly superior visual phenomena that often dominated Enlightenment discourse. For him, the world of odor composed a kind of silent language of living beings, underlying the more obvious channels of communication available through sight and sound. This paper will examine the situated significance of this work from a number of perspectives, touching on the relationship of this classification system to Linnaeus' better known botanical catalog of sexual characteristics; its relevance to contemporary medical theory and practice; its position within the broadly empiricist Enlightenment search for an understanding of sensation and resemblance; and its association with the traditions of collecting and organization that are

reflected in such 18th century artifacts as curiosity cabinets and pharmacopœias. I hope to demonstrate that Linnaeus' work on odor reflects a viable alternative perspective on sensation in general, and smell in particular, from that reflected in the visually-dominated histories of science that are commonplace today.

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The Play of the Eye: Guns, Binoculars, and the Transformation of British Ornithology, 1870-1930

The paper investigates the transformation of British ornithology from a classical natural history pursuit to a contemporary life science in the time from the late nineteenth to the early twentieth century. It employs the conceptualization of the relationship between means and ends first formulated by John Dewey and later adopted and refined by Bruno Latour in order to analyze this process of transformation. The core argument is that the means of scientific representation (i.e. the answer to the question "how should we represent?") and the ends of scientific inquiry (i.e. the answer to the question "what do we want to know?") can neither be empirically separated nor analytically distinguished, but are constituting each other reciprocally in a given course of action and institutional context. British ornithology transformed in an interplay of the means and ends of bird collecting. Initially, birds had been collected with the gun and preserved as mounted specimens in private show-cases and public museums. With the mass-production of binoculars and photo-cameras since the late nineteenth century bird collecting transformed from the accumulation of dead bodies into the production of sight-records and photographic images of living birds. Through the use of these tools the interest ornithologists took in birds gradually transformed. Natural history collectors began to turn from the study of the anatomy and classification of dead birds toward the study of bird behavior (ethology) and the relation of birds to their particular environment (ecology). The paper thus demonstrates how the means of representation and the ends of inquiry constituted each other reciprocally in the transformation of British ornithology.

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Collide-o-scope: Technological Metaphors for Vision and the Influence of 1960s Psychedelia

From a phenomenological perspective, our "ways of knowing" are influenced by how we make sense of the information provided to us by our sense organs. How we conceptualize the processes of these sense organs, however, is neither fixed nor uniform, and has evolved considerably over time. This paper investigates this history by examining the use of imaging technologies as tools and metaphors for understanding human visual perception. The paper argues that, over the course of the twentieth century, a paradigm

shift occurred in how imaging technologies were evoked in the conceptualizing of sensory perception, with photography and cinema being usurped as dominant metaphors for visual perception by metaphors derived from electronic circuitry and digital networks, in which our brains are neural computers that process sensory data from the wires and circuits of our central nervous system.

The paper identifies the 1960s psychedelic era as a key moment in this shift. The philosophical discourses and cultural productions of the psychedelic movement were deeply concerned with sensory perception and ways of knowing, and media technologies were frequently used to explore these issues. In doing so, the psychedelic movement engaged in a process of interrogating the dominant cultural and technological metaphors for visual perception; century-old phenomenological debates about vision and knowledge were re-energized within popular discourse and were explored within the context of emergent electronic and digital technologies. Examining the psychedelic era in this light, this paper argues, can help us better understand the underlying technological metaphors that inform contemporary ideas about vision and knowledge.

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Text, Images, and Dennis Flanagan combine: Scientific American and Effective Science Communication

Scientific American reinvented itself for the atomic age in 1947. Fresh leadership, including Dennis Flanagan, determined a different way to communicate science to a public: use scientists to write and images to express. The success of this new science writing style established how to validate scientific knowledge for a public and which knowledge was valid. The recently collected Flanagan papers at Cornell University provide insight into how he thought science should reach a public and the role of images in that process. Within those papers is a draft manuscript, titled "Text and Image," confirming that to Flanagan neither text nor image alone could communicate what they did together.

The most effective role for images in science and more importantly in science journalism continues to be debated. During Flanagan's 37 year tenure, technologies changed drastically. More powerful technologies alter both what it means to see and how best to express what is seen. Nevertheless, from his days on Life magazine to his time at Scientific American, Flanagan continued to believe a story was told incompletely if told without images. Images are often the data on which scientists found and confirm claims. Flanagan's methods insisted that regardless of whether scientists' words can stand alone, if one wants to communicate successfully to a public and provide provocative, sellable magazines about science one must provide the scientists' words and visualizations. Flanagan's papers, particularly the manuscript, reveal how his beliefs shaped what it means to provide and to be "good science" for a public.

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Please Don't Touch the Users: The Sense of Touch in Pervasive Computing

Our sense of touch plays an important role in defining the qualities of space. Pervasive computing, therefore, should in part, be a computing of touch. As computing becomes ensconced in everyday space it seems logical that the sense of touch, so instrumental to our experience, be thought of in the design of computing systems. "The skin is the largest organ of our body, yet only a small portion of it (i.e. the hands) is engaged in most human computer interactions." (Tan & Pentland) The familiar desktop interface reduces the body to less than an eye and a finger. This paper provides a background for the use vibro-tactile displays towards embodied interaction. A survey of the types and uses of tactile displays is discussed, as well as an overview of how the skin senses and the psycho-physical attributes that are pertinent in designing tactile interfaces. The paper concludes with speculation about vibro-tactile interfaces for the torso, and why they might be a compelling choice for embodied interaction with physical space.

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15.11 Techniques of Knowing in the Contemporary

Organizer/chair: Meg Stalcup
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This panel explores techniques for making and using knowledge that range from the law to visual media. It begins in Mexico, presenting legal narratives that construct reality and authorize what becomes memory. The next paper takes up this examination of legal knowledge, but under the distinctly different circumstances of post-Soviet Ukraine and with a focus on the law-makers. In a related fashion, the paper that follows is on how the training and experience among law enforcement affects the production of criminal intelligence. Hydropower in Laos provides the next scenario, contrasting how environmental activists effectively challenged technical certitudes and a hydropower company's instrumentalization of affective and imaged relations between industry and activists. Unequal power relations and the use of remediating knowledge is taken up in a study on warisata in Bolivia, which explores an Aymaran walking practice as both learning and revolt against an oppressive government. Walking also used to be a way of knowing and writing about Mexico City, discussed in a paper on why a shift has occurred and its relation to the increasing "magazinification" in writing about the city. Knowing Mexico City serves as well for the final paper's entrée to a related issue, that of the connection between the visceral, the aesthetic and the political in visual media. The panel collectively asks what understanding of the contemporary emerges from this conglomeration of data on mutually constituting techniques of knowledge production, knowledge, and authority.

Jalani Mahiri
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Pachucan Miners and Legal Truths

On March 10, 1920, 84 miners in the Mexican town of Pachuca were killed in a fire when management decided to close off the exit in order to limit further property damage. No one, however, was indicted in the subsequent investigation. The law works under the assumption that reality is communicable through narratives organized according to the concepts and structures of the law itself. It contends that this communication is objective, thus, its convictions are legitimate and the commandments that spring out of these convictions should be obeyed. Such a chain of statements articulates the power of the law to stabilize a certain state of affairs, it establishes its power to create reality: not only through what it allows and what it forbids, but through how it says the event should be remembered. This paper analyzes the judicial file containing the inquiry into and conclusions about the mining massacre, beginning with the question, How does the law organize knowledge? Legal narratives have a purpose, and the consecution of this

purpose depends on the information gathered by officers of the law, as much as in the form in which this information shapes a coherent story. I will consider how exactly the linguistic machine of this judicial file works, what it tells us beyond the original purposes of the subject that created it, and how other texts or subjects resisted this representation of reality and its concrete consequences.

Monica Eppinger
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New Ukrainian Parlimentarians

After the Soviet Union dissolved in 1991, the remaindered pieces embarked on projects of reconstitution. Legal change became central to remaking post-Socialist economies, infrastructure, and citizenry. Constitutions were written, civil and criminal codes drawn up, private property created with the stroke of a keyboard and a parliamentary swipe-card. The question then, Does making new laws require making new law-makers? Studies in sociology and political science have found that former elites survived to assume command of political processes and economic resources in post-Socialist countries. Bases on twelve months of research into the parliamentarians of post-Soviet Ukraine and their work in writing a constitution and creating private property, this paper takes up the question of how much actual continuity that signifies: not only "can you teach an old dog new tricks," but also, "is it really the same old dog?" Ukrainian parliamentarians had to make sense of conditions of discursive rupture, altered modalities of power, and different knowledge practices. This research investigated how authority is established in order to make authorized speech acts, how power is constituted, and what results. In this study of "top dogs," the emergence of a political and economic elite of post-Socialist Ukraine is examined through recursive relationships between knowledge produced, the practices of knowledge production, and the production of those elite producing the new knowledge.

Meg Stalcup
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Information, Knowledge, Truth: Intelligence-led policing and police-produced intelligence

This paper considers how the training and experiential knowledge of U.S. law enforcement and the international police at Interpol affects the production and use of criminal intelligence. Intelligence is produced by collecting, sorting and organizing "raw data". Some portion of its authority stems from the mystique of those techniques; information is evaluated according to obscure criteria in a process generally described by practitioners as a craft. Intelligence can be understood as a specific form of knowledge, one that frequently authorizes far-reaching truth claims. On another level, its production presents an empirical site to inquire into a form of truth, how we know it and who can speak it in the contemporary world.

Jerome Whitington
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Knowing Uncertainty in Lao Hydro Development

Hydropower developers are the villains of international development, at least for environmental and human rights activists. But over the past two decades affected communities and NGOS have strikingly reconfigured the moral landscape of hydropower projects. Environmentalism has gone beyond reforming the industry toward fundamentally undermining the technical and political bases of hydro development. While eco-activists called into question the developers' use of bureaucratic exclusions from the Lao state, they also challenged many of the technical "certitudes" upon which massive water works rested. As a result corporate managers who worked in a planning modality have moved to 'handle nature after its end,' as Ulrich Beck has suggested of the emergence of risk discourses. This paper explores a hydropower company's move to deal with the threat of activism by finding new ways to operate, instrumentalizing affective and imaged relations between the hydro industry and activists as ways of knowing. Managers build 'cooperative' relations with activists so that the activists themselves became a kind of recursive bellwether, helping to indicate what environmental variables threaten the firm's operations.

Laurence Cuelenaere
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Warisata: Learning through walking as revolt, rebellion and disobedience

In 'Warisata y el Sistema de Los Masacres' -1996- the Bolivian writer Luis Rojas Aspiazu pointed at how the Bolivian educational reform has systematically ignored and reduced 'Warisata' to an administrative event and/or experiment. Warisata is an educational pioneering effort that took shape in 1931 on the Northern Bolivian Altiplano in west central La Paz Department. Its main objective was 'educating' the Aymara with the purpose of liberating the 'indio' from a subjugating dictatorial political background. Its premise was that the learning and either form of apprenticeship would be grounded in the activity of walking This paper explains Warisata and discusses why it has been ignored by the main proposals of Educational Reform Law (1994). I look at the signification that walking takes on the Bolivian Altiplano and why learning through walking still carries the connotation of 'revolt,' 'rebellion' and 'disobedience.' Ethnographic data collected over a time spam of 16 month details the idea that the activity of walking (sarnaqana in Aymara) conveys the sense of 'for whom there is knowledge', revealing a world exceeding the punctuality of sensory presence and explain why walking potentially and actually challenges the Bolivian government.

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Writing a Metropolis: From national to globalized modes of knowing Mexico City

What are ways to know a metropolis? And how have these changed with the most recent influx of transnational capital and fashions that have transformed some into "global" cities? This paper compares the practices of writers, over the last half century, who have made Mexico City an object of reflection. My argument is that a rupture has occurred between what I call an import-substitution mode of knowledge production to a globalized one. If chroniclers, such as Salvador Novo, considered it an imperative to walk the streets about which they wrote, much like the nineteenth century flaneur, how do writers today research an urban center that has grown to the point that it can no longer be known by the same means? Critical to the earlier mode were cafés, bars, and brothels, not only because they were the nodes where writers encountered each other, dialogued, argued, learned from one another, and formed relationships, but also because it was from there writer encountered the city, especially what they often considered the most "real", or its "subterranean" element. Similar to the import-substitution strategy in the economic sphere, producing a national literature, as much as validate, attempted to conjure up an urban community. Today both public and privately funded writing conform to a form that has been called the "magazinification" of writing, where the book or long article have been overtaken by the modular digital text accompanied by images. What are the possibilities within limits inherent in these practices of knowledge?

Misha Maclaird
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Nausea and Steadicam: Visceral Violence and Stylization in Recent Mexican Cinema

The Mexican nota roja (crime section), considered one of the most important fields of journalism in Mexico for more than 100 years, aims to transmit through descriptive writing and photos the same nausea experienced by those directly involved in murder, rape, assault, and their aftermaths. The field's artistic bar has been set high by world-renown photographers, such as Enrique Metinides, who "find the sublime in death." Mexican cinema over the past 15 years has also taken a century of violent depictions to a new extreme, attempting to show urban crime "as it really is", in all of its natural shock value, and as the result of jaw-droppingly unscrupulous politics. Yet the most recent commercial cinema reproduces these images by combing techniques of documentary "realism", such as the use of a Steadicam, with the contemporary visual stylization of television and music videos (fast editing, disorienting jump cuts, textured film stock, saturated color, intensified music). This paper takes up the following questions: What is the connection between the visceral and the aesthetic? What are the politics of making death and violence known to an audience or readership, not just through text but through visual media's ability to recreate internal turbulence? How does stylization induce a

desire to know violence experientially and yet how does creating this desire affect the vein of social justice sought by realism's visibility politics?

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Remaking Ancestry, Re-reading Aboriginality: The Life of Family Trees in Saguenay-Lac-Saint-Jean, Quebec

What forms of family genealogy do European and Aboriginal Quebecers practice? How has a national genetics project drawn on these practices to devise authoritative family trees for Canadian health research? In Quebec, family genealogy, which is a popular national pastime monitored by professional guilds and public associations, is a vexed pursuit. Private and professional genealogists rely on 16th, 17th and 18th century French Catholic church records to generate and authenticate family trees. However, their interpretations of these records often differ. Based on 14 months of ethnographic fieldwork in Quebec, I will first suggest two major processes that are at work in the production of competing versions of the genealogical past. I will argue that: 1. The shifting presence of the Catholic church in Quebecer's daily lives since the secularization overhaul of the 1960s ("The Quiet Revolution") has prompted new, often contradictory, conceptions of the relative validity of old Church records, especially when it comes to "Indians." This has lead to diverse revisions of old ways of knowing about one's ancestors, significantly changing the local practice of genealogy. 2. The politics of Anglophone-Francophone-Aboriginal relations have further complicated this first development. Genealogists' judgments about the relative trustworthiness of different genres of historical record are intimately bound to notions about language and debates about historical "French-Indian" versus "English-Indian" relations. I will conclude by discussing how demographers and genetic counselors at a major federally-funded bio-genetic project in northern Quebec have negotiated these competing genealogies in order to conduct research on and treat hereditary disease.

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