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frontpage illustration: Lausanne, the lake, by Laura Watts.

Hubris or Hybrids? On the Cultural Assessment of Nanotechnology

by Andrew Jamison

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As nanotechnology begins to leave the laboratories and work its way ever more actively into our societies, there is a tendency to exaggerate what it is good for and, at the same time, to disregard the risks involved. There is talk of being able to redesign the human body from the “bottom up”, of manufacturing invisible products with an infinite range of uses, of vast fortunes to be made by exploiting the potential of the nanorealm.

Things behave differently down there, even though nobody seems to know very much about why that seems to be the case. This is a good example of Aristotle’s “*techne*” – the practical know-how of manipulating objects – rushing on ahead of “*episteme*” – or theoretical-scientific understanding. In the words of Jennifer Kahn, writing in the June 2006 issue of *National Geographic*, nanotechnology is like a tsunami – a “long, low wave whose power becomes clear only when it reaches shore and breaks”:

Nanotechnology has been around for two decades, but the first wave of applications is only now beginning to break. As it does, it will make the computer revolution look like small change. It will affect everything from the batteries we use to the pants we wear to the way we treat cancer (Kahn 2006: 100).

None of this will come automatically – technology is certainly not autonomous - and in many European countries, as well as in the European Union as a whole, nanotechnology is receiving large amounts of public funding. Apparently, private investors are still not sufficiently willing to put their money into this next big thing. And while concerns are beginning to be voiced about the potential dangers lurking in the nanorealm (and not just by horror story

writers like Michael Crichton, whose novel, *Prey* (2002) gave us the vision of vicious swarms of nanoparticles attacking the scientists who had spawned them), only a small amount of the publicly supported research is going into issues concerning health and environmental consequences (see Ross 2006).

Instead, the ancient crime of hubris has experienced a new lease on life, as the emerging actor-networks of academic entrepreneurs and their supporters promise more than they should, and – as has been the case with genetic engineering - run a serious risk of generating opposition within society. Hubris is a word that comes to us from the Greeks, and has been defined as “an impious disregard of the limits governing human action in an orderly universe. It is the sin to which the great and gifted are most susceptible, and in Greek tragedy it is usually the hero's tragic flaw.” (*Encyclopedia Britannica* 2006). In the vernacular, it is commonly used to refer to the arrogance of those in power, when they exaggerate their military strength and superiority and forget the consequences, as has been the case in the war in Iraq.

As far as I am aware, it was the Finnish philosopher Georg Henrik von Wright in his cultural writings of the 1960s and 1970s who first started to apply the term to the misuses of science and technology in the contemporary world. von Wright associated the “particular hubris of the modern technological way of life” with an “unreasonable redirection of nature’s causality for human purposes” (von Wright 1978: 90). In his influential book, *Vetenskapen och förnuftet* (Science and Reason), published in Swedish in 1986, he brought his criticism of the hubris of science and technology into the broader public sphere in the Nordic countries. In referring to classic tales of hubris such as the Greek myth of Prometheus and Francis Bacon’s vision of “New Atlantis”, von Wright attempted to

mobilize cultural history and what he called the humanist attitude to life (*livshållning*) in order to evaluate the ways in which science and technology are used in society.

In the introduction to our recent book, *Hubris and Hybrids* (Routledge 2005), Mikael Hård and I characterize hubris as the “if only” syndrome, “the eternal technical fixation that is deeply embedded in our underlying conceptions of reality”:

If only we could develop an even better instrument of production and destruction, if only we could tame another force of nature to provide us with unlimited energy, then our wealth and our capacities – the values by which we measure progress – would be so much greater. More than two millennia after the sun melted the wings of Icarus for coming too close, we are still under the spell of hubris, trying to fly higher and higher (Hård and Jamison 2005: 5).

The tendency to hubris is not merely a matter of the hype that is so much taken for granted in our commercialized world as a regrettable, but necessary fact of life. The widespread selling of science in general and nanotechnology in particular is only a small part of the problem with the way nanotechnology is being appropriated into our cultures. The hubristic “crime” is not commercialization as such, but its overemphasis and the general lack of awareness and interest in any other possible meanings that nanotechnology might have. The tragedy is that “public relations” have been reduced to marketing. At a discursive level, what Mikael and I have previously referred to as the story-line of economic innovation is so dominant, so hegemonic that it tends to overwhelm all the other possible ways to talk about science and technology in society (Jamison and Hård 2003).

As in other fields of technoscience, there is also a noticeable lack of public accountability, an absence of procedures and institutions by which decision-makers are required to account for their decisions. This is, of course, not exclusive to nanotechnology, but, for a variety of reasons, it is particularly serious now – after five years of environmental skeptics and holy wars against terrorists. In most European countries, it seems fair to say that there is no public space available any longer for serious discussion and debate of science and technology, no meaningful effort in the media, the schools, or anywhere else in the

public sphere to provide opportunities for qualified reflection or cultural assessment of what we, as a species, might actually want to do with these and all the other amazing new technologies at our disposal. Other concerns have colonized the life-worlds where technology assessment used to take place.

Among the scientists and engineers themselves, the makers, or constructors of nanotechnological products, the dominant values or “norms” are entrepreneurial. Decades of telling stories of innovation and linking universities to industry have transformed the identities of many scientists into project-seekers and networking money-makers. What used to be the responsibility of scientific societies and university departments – to discuss moral and ethical issues related to one’s scientific field – has been outsourced to professional philosophers and theologians. And many of them have also fallen prey to the urge to become entrepreneurs and sell their ethical insights to the highest bidder. The result is an array of competing firms, selling their own brand of nanotechnology, searching for markets rather than serving society. The actual scientific knowledge that is being made is subjected to what Aant Elzinga once characterized as “epistemic drift”:

...the process whereby, under strong relevance pressure, researchers become more concerned with eternal legitimation *vis-à-vis* policy bureaucracies and funding agencies than with internal legitimation via the process of peer review. This may be seen as a process of erosion of the traditional system of reputational control (Elzinga 1985: 207).

It is as if the public information campaigns and media debates, the popular movements and expert criticisms against atomic energy – and for the development of renewable energy – during the second half of the 1970s had never happened. Those experiences led, in many countries, to agencies and offices and research programs in technology assessment, and made it mandatory at some universities for science and engineering students to be educated in what we in Aalborg still refer to as “technology, humanity and society” – and which we still teach courses about. Could it not be a good idea to bring back some of that concern with social responsibility – and not least back into our own field of science, technology and society studies?

Of course, nanotechnology is not atomic

energy, it did not come into society in the form of a horrific bomb which killed hundreds of thousands of people. Rather it is slowly but surely insinuating itself into our societies. And as with other technological artifacts and scientific facts in the past, the chances are that nanotechnology will also tend to elicit different uses as it spreads across the social landscape. But like atomic energy, genetic engineering, and so many other momentous scientific and technical achievements of our recent history, the cultural appropriation of nanotechnology is skewed from the outset. It is not motivated by responding to what we called in the 1970s “basic human needs”, or what we called in the 1990s sustainable development; rather, it is driven by “market forces” to seek out commercial opportunities, niches in a global competition for profits. Nanotechnology is supply rather than demand driven, the result of a modernist – and highly problematic – cultural fixation on novelty and “innovation”. And like the other fields of technoscience, nanotechnology is being subjected to the same tendency to exaggerate the benefits and downplay the risks that has been so apparent in relation to atomic energy and genetic engineering, as well as information technology.

This one-dimensional thinking, the tendency to hubris appears to be all powerful and all encompassing. The nanotechnologists, like the genetic engineers, information technologists and atomic physicists before them, are fast becoming contemporary heroes, the ones who are to lead Europe in the global competition for market shares and economic growth. And even those of us who should know better – the students of science, technology and society – are curiously silent, seeing the nanotechnologists as new objects of study, rather than problems that require reflective analysis and cultural assessment.

It often seems hopeless to challenge the dominant policy agenda with its story-line of innovation, the contemporary myth of Prometheus. The nanotechnologists and their paymasters – our paymasters, as well - play on such deeply rooted cultural values, and they are able to mobilize such enormous amounts of human and material resources that it seems impossible to try to bring them down to earth and get a serious conversation going. And yet, if we are not to do it, we who claim to know something about the relations between science, technology and society, then who can? It seems to me that the dangers – and the opportunities – are simply too great to leave the development of nanotechnology in the hands of those who still

believe in what von Wright labelled the myth of progress.

The nanotechnologists and their supporters in government, industry, and the universities are not necessarily evil people. Like so many of our leaders, our power elites, they are simply afflicted with an overdose of arrogance and not a small amount of greed that calls for a form of socio-medical treatment rather than opposition. Their illness, their hubris needs to be diagnosed and treated. And that is where the hybrids come in. For if we are to make appropriate use of nanotechnology, the new knowledge needs to be combined with what we already know – about responsibilities to future generations that need to be fulfilled (remember sustainable development?), and about social and environmental problems that need to be solved (remember basic human needs?). We need to help foster a new way of talking about nanotechnology, a hybrid story-line, or policy agenda: call it “green nano” or “human nano”.

It is a multidimensional hybridization process that is called for, a vast project of socio-cultural learning. We, in the social and human sciences, and perhaps especially in the social study of science and technology need to work with the nanotechnologists to develop educational and research programs so that society can make beneficial use of their activity. And, perhaps most importantly, we need to educate them and those who support them in what Aristotle called *phronesis*, the kind of moral knowledge that is so essential, but so sadly lacking, in an age in which our scientific knowledge and our technical know-how are combining in such powerful new combinations.

Perhaps engaging with nanotechnology and nanotechnologists can be a way to escape from the ironic detachment that many in science and technology studies have adopted as their stance to society. It might be a way – to paraphrase my colleague in Aalborg, Bent Flyvbjerg (2001) – to make STS matter. If we live in a world that is no longer modern, or, as Bruno Latour so famously put it, a world that has “never been modern,” then we need no longer separate the human and non-human elements of our identity, nor, for that matter, reproduce, in our work, the barriers between the natural and technical sciences, on the one side, and the social and human sciences, on the other. And if our world – that is, if reality itself - is indeed one in which humans and non-humans can no longer be meaningfully distinguished from one another, and we find ourselves in a world of hybrids, then let us begin to think like hybrids and foster a hybrid

imagination.

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von Wright, Georg Henrik (1978) *Humanismen som livshållning och andra essäer*. MånPocket (the quote is from a lecture from the early 1960s)

Building on Borders: Constructions of Ecological Knowledge

by Astrid E. Schwarz

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A Report on the interdisciplinary and international workshop at Technical University Darmstadt, April 6 - 8, 2006

The workshop "Building on Borders: Constructions of Ecological Knowledge" was devoted to an exploration of the various practices of constructing borders and boundaries in ecology and environmental studies.¹ The workshop brought together about 20 scholars from 9 countries and different disciplinary fields, including the history of science, ecology, philosophy, sociology and social anthropology. We had 6 sessions that covered a range of topics. These included metaphors and the character and morphology of concepts of borders and boundaries, debates around the physical character of borders and limits in ecology, the dynamics of ecological knowledge in environmental studies, and, finally, reflections on the process of recontextualising ecological knowledge in the age of technoscience. The workshop was organised by Astrid Schwarz (Darmstadt TU) with the assistance of Kurt Jax and Christian

Haak (UFZ Leipzig), as well as Achim Lotz (formerly of Darmstadt TU).

The starting point of the workshop – and probably the common perspective shared by most of the participants – might be described in terms of the following basic problem in structuring ecological knowledge. One of the most important features of ecological knowledge is that it is constructed along the borders between science and society, fact and value, applied and theoretical sciences, between different disciplines and scientific practices and, last but not least, between different epistemological positions in ecology itself. Ecology cannot be described adequately by means of the usual epistemic concepts, nor by using, say, a one-paradigm model or the idea of a unifying theory that structures the whole field. Considering the growing importance of ecological knowledge in addressing some of the most pressing problems at both global and regional level (e.g. global warming, vanishing natural resources and the deterioration of soils and water resources), it should be self-evident that we need to know

more about the logical and disciplinary constructions of ecological knowledge. The debate about borders within and around ecology obviously also includes debates concerning the role and importance of ecological knowledge in social processes and in negotiations about the kind of nature with which we wish to live. Over the last three decades most of the opposite concepts mentioned above have been examined above all in the field of science studies (STS), including research programmes on inter- and transdisciplinarity. However, none of these debates has analysed either the structure and metaphors of borders and boundaries nor their historical or philosophical status. Moreover, most of the case studies in STS and HPS are taken from physics or engineering or, within the life sciences, from genetics, physiology and molecular biology. These shortcomings were brought to the fore in the workshop: The overarching objective was to launch a debate on ecological knowledge by investigating not only concepts of borders and boundaries but also the established theoretical framework of “boundary discourse” in STS and HPS.

This way of framing the debate constitutes an underdeveloped topic in each of these communities. Accordingly, the workshop announcement highlighted our intention to map ecological knowledge using a deliberately conceptual topology, focusing on three types of borders and boundaries: first, the concepts of borders in the scientific context; second, boundaries between different disciplines, institutions, scientific practices and analytical concepts; and, third, the limits and scope of ecological knowledge in general. One of the explicit objectives of the workshop was to develop, by the end of it, a more detailed and clear-cut topology of the borders and boundaries of ecological knowledge, including existing work in the field of the history, sociology and philosophy of science. This was considered a necessary prerequisite for being able to transfer ecological knowledge in an appropriate and comprehensible way within and between different scientific and other social groups, as well as for the social construction of natural environments.

The first part of the workshop was entitled “Building on Borders - Morphing Knowledge” and was aimed at achieving harmonisation between the concepts of border and boundary used in HPS and STS respectively. Kevin de Laplante (Iowa State University) began with the statement that ecology is currently being called into service in many different fields, from

applied ecology and endemic ecology to ecologically oriented sciences and environmental politics. He then contrasted this “open source picture” of ecology with a disciplined concept of ecology as a natural science which, as he emphasised, is essentially related to issues of demography. He proposed labelling this ecology as orthodox ecology in order then to argue against it and to show why this label is not appropriate (because, for instance, ecology is already a highly fragmented discipline, because it possesses no unifying concept and, finally, because orthodoxy reinforces disciplinary fragmentation and segregation). Uta Eser (Nürtingen Polytechnic) began her contribution by asking if this broad conceptualisation of ecology shouldn't better be called environmental sciences: what pragmatic purpose or motivation warrants the call to extend the meaning of scientific ecology in this way? The lively and far-reaching discussion that followed threw up a number of topics and questions that ran through the whole workshop. To highlight just a few of them: - Is it appropriate to consider the environmental sciences as simply the applied science of a theoretically conceptualised ecology and, if not, what is the “added value” of the former and what is its epistemology? - Another important issue was that of the power inherent in labelling ecological knowledge: who is producing this knowledge and to whom is it denied? Both society and science seek labels that confer power and authority, but who is labelling whom in this process? What is immature ecological knowledge “worth” in a world where the mature sciences count? What is concealed by the rhetoric of mature science and who is interested in constructing it? What are the characteristics of immature science and in what sense is a science “mature” at all?

The subsequent presentations were aimed at examining concepts of border and boundary in the discourse of STS. Unfortunately the paper to be delivered by Irene Klaver (University North Texas) had to be cancelled for a most appropriate and ironic reason: the unwieldy border politics of USA Homeland Security left her as a non-citizen in an alien limbo between a visa and a green card. Since she circulated a short summary to all of us, we know that we missed a discussion on “the so-called edge of boundaries”, that is, boundaries as dynamic places of potential transition, transformation and translation. Thus, her focus is not on the boundary as a simple line of division but on “the power of boundaries as an area of co-construction”. In this sense, not a few ecological concepts might be understood as

oxymorons, pointing simultaneously to two mutually exclusive meanings, as reflected, for instance, in the concept of ecotone, the area where two different ecosystems meet. Astrid Schwarz (University of Darmstadt) was also interested in the spatial character of boundary concepts. In her paper “The Morphology of Borders” she pointed to the relational character of boundaries and suggested, following a boundary concept proposed by Kant, that there is “always something positive”² in the way boundaries bring two entities into relation with one another. Given that the production of ecological knowledge – and even more so that of the environmental sciences – has to be seen as being constitutionally located at the intersection of various boundaries, the knowledge thus produced and labelled as ecological will be crucially influenced by the particular character of those boundaries. Schwarz then presented a historical reconstruction of borders in environmental discourse, starting with the “border trauma”³ of the 1970s and the “global existential crisis” that made the environment and ecology issues of public concern, continuing through the turn from an ontological to an epistemological perception of borders, and ending up with a detailed discussion of concepts developed in the HPS and STS debate, focused on boundary work, boundary object, trading zone, and border zone.⁴ In order to get a better understanding of their formative influence on the construction of ecological knowledge, she then proposed looking more closely at the images and analogies and the evoked form and structure of borders and boundaries inspired by geographical and geopolitical concepts and models. The modified border model⁵ she presented allows for a detailed and multilayered analysis and visualisation of border concepts and may therefore help towards a better understanding and conceptualisation of the different constructions of ecological knowledge.

“Oikos and logos - ecology as the search for home” was the closing presentation on the first day, given by historian Paolo Palladino (Lancaster University). He proposed drawing parallels between the recent discussions on neuronal cells or stem cell technology and contemporary ecological discourse. This, he suggested, reveals the similarities of these two apparently very different technologies and their constructions of nature. In what followed, Palladino offered a plethora of approaches but stressed two aspects in particular, both of them concerned with issues of ontology. With regard to the first one, he pointed out that ecology tends

to eschew “the holism of earlier forms, but only by displacing the problem onto history” – as do the laboratory life sciences by saying, for instance, that “neural stem cells may one day act as nature’s own brain surgeon, psychiatrist, pharmacist, and therapist”. With regard to the second aspect, he referred to the nature-artefact distinction that emerged in ecology, for instance, in the debates over ecosystem modelling and influenced the appreciation and validation of the formal qualities of mathematical models, namely their generality, precision and realism. To underscore his hypothesis, Palladino suggested that we look at the relationship between art, politics and the life sciences. He then took us through a wide range of artistic representations of the life sciences in contemporary works of art (e.g. Georg Dietzler’s “Self-decomposing Laboratory” 1999 and Mel Chin’s “Revival Field” 1990) as well as romantic landscape paintings. In his discussion of ecology and romanticism, Palladino highlighted the common roots of the idea of nature as humanity’s “home” (the oikos) and ecology’s inner tension between the incommensurable methods of holism and reductionism; This led to the final question as to the common baseline of works of art and ecology. This, he suggested, might be the “ecological” emphasis on the intrinsic relations contained in everything that constitutes a particular cultural practice and that necessarily needs a subject to go beyond the two antagonist elements that define nature in modernity. Arguing against Latour’s ontological relationality, which abolishes all categorical boundaries and hierarchies, Palladino defended the notion of a vigorous subject, a being who “can witness the transformations of the world” and maintain, break off and rebuild the boundaries of knowledge.

The second day started with a participatory workshop organised by Sandra Bell (University of Durham). She asked us to utilise the power of concept maps to explore the issues of borders and ecological knowledge in a way that avoids the linear process of writing.⁶ With the help of Astrid Schwarz, she had prepared a list of types of boundaries that were to be picked up and visualised by reasoning for instance on the whole “terrain” of ecology or on the strength and permeability of its borders. Urging us to use lots of colours, symbols and signs, she grouped us around 6 tables and left us alone, asking us “not to think too much but to get drawing right away”. The result was a stunning diversity of drawings, which told just as many different stories about ecology and “bordering”. The discussion about

the drawings prepared us perfectly for the subsequent sessions, which covered an equally wide field.

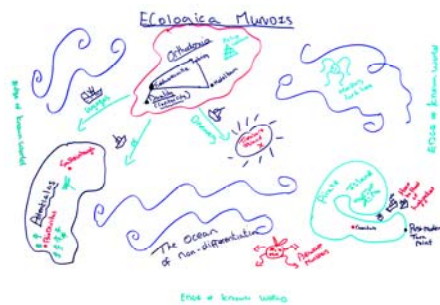


Fig.1: Drawing by Sandra Bell

The session that followed was dedicated to negotiations of borders and limits in scientific ecology, with presentations by Patrick Blandin (Museum Nationale d’Histoire Naturelle, Paris) and Kurt Jax (Centre for Environmental Research, Leipzig), and comments by Angela Weil (München Technical University). Blandin took up the longstanding and still undecided debate on the stability of ecosystems and the consequences for species diversity, productivity and the complexity of ecosystems. He used the pros and cons in this debate to point to the awkward border between theory and ideology, and then went on to propose that we should move from stable equilibrium theories to dynamic models: “It is just pleasant for people to think that ecosystems are stable.” Adopting a model of co-changing entities would have far-reaching consequences for theoretical, psychological and ideological modes of thinking, not only about the ecosystem concept(s) itself but also our conceptualisations of nature in general. In conclusion, he pointed to the concept of the transection of systems, as proposed by John Dewey, the renowned scholar of pragmatism, arguing that this concept might be useful in developing a concept of ecosystem that promotes principles of contingency and chance and puts more emphasis on individuals. Following on from Blandin, Kurt Jax discussed ecological boundaries from the perspective of functional versus topographic limits. Starting with the rhetorical question as to the need for and significance of boundaries, he then presented a case study on the Yellowstone National Park in order to elucidate the conflict between functional and topographical borders. Jax then went on to present some interesting details from the relevant literature (especially Glick et al. 1991 and Strayer et al. 2003), elaborating on the properties of boundaries in ecology and also the practice of using images and metaphors in relation to

functional boundaries in particular.

The next speaker was Peter Taylor, who had first given us a short handout with “some thoughts on border-ing” along with some homework to do; he now asked us to engage in an interactive analysis of the paper he had circulated on “Savanna Plant Ecology” (Greg Sharam), focusing on the borders more or less explicitly mentioned in it. He encouraged us to think of borders as phenomena that are constructed through processes of intersection, as places where different kinds of dynamics come together, and as places that are policed (“with more or less seriousness”) and that might be reconstructed when the premises change – in other words, we should not only illuminate the construction of borders, “but also the possibilities of alternative constructions”. Peter Taylor left us with two messages, the first one emphasising that research should be done in a dialogue between models and phenomena, and the second one claiming “to make better work together inventive things and old things”.

The second part of the afternoon session was dedicated to the history of urban ecology from the perspective of cultural studies. Jens Lachmund gave a presentation and Tobias Cheung commented. Lachmund shared with us some insights from his detailed study on wasteland preservation in West Berlin. He started by reconstructing the history of urban ecology, focusing on the institutional and political dynamics of land-use planning in academia as well as in the public sphere. We were told how the ecological agenda entered this discourse and how the new environmental activism also intervened. Having now arrived in the era after the fall of the Berlin wall, Lachmund turned in more detail to the conflict of the environmental programme of restructuring urban places and spaces by framing wastelands as biotopes. The citizens of Berlin disagreed with this interpretation for a variety of reasons, aligning themselves along several borderlines. Not a few urban residents saw wastelands more as ugly and uninteresting, even “as kind of wounds” that recalled the bombing of the city in World War II, than as precious spots of pristine and wild nature; accordingly, calls for nature protection based on scientific parameters such as species diversity or vegetation features did not hold too much appeal for these citizens. Calls for wasteland conservation were more successful when they coincided with other public concerns, as was the case with the “Südgelände”, an abandoned area of railway facilities. This place was given a more appealing public image by being designed as a

nature park with regular trails and some objects of art. One might say that in this case consensus was created by aesthetic interventions, and that the discourse on urban nature and biotopes succeeded in establishing cohesion between various expert groups and other actors. Cheung's comments focused on three basic arguments. In the first, he questioned the notion of expertise in a sociological context, in the second he argued about the transformation of a city processed through the work of ecologists and thirdly he argued for interferences between changes in/of cities and the models of ecologists. Being thus well prepared, we had a lively discussion with some apposite references to the foregoing presentation, including some debate about intersecting places in urban dynamics.

The closing evening presentation was given by Wolff-Michael Roth (University of Victoria) on "Building Ecological Knowledge: Objects and Actions" and commented on by Chunglin Kwa (University of Amsterdam) with his paper entitled "Schopenhauer not Popper". Roth took us on a virtual visit to some fish factories on Vancouver Island (Canada) and made us familiar with issues around "constructing salmon life history", the enhancement and protection of fish habitats, and activities around salmon breeding. By means of an ethnomethodological study, he illustrated what happens when a fish is sacrificed to research and reified by images and graphs. His central thesis was that scientific objects are stabilised by images and that the stability of such objects is therefore something that is produced in the process of manipulating things, using instruments and visualisation techniques. In arguing for the importance of locally and tacitly produced knowledge that is crucial for "embodied practices", Roth was clearly following some well-established arguments in STS literature. This was reinforced by his reference to Latour's "chain of representation", in which the world and language are connected by a sort of cascade model in which each overlaps but can never be interlinked with the other. At this point Roth offered a critique of this model by pointing to the fact that Latour did not include the element of action in his model; Roth suggested that objects become coherent (and thus knowledge stabilises) when the chain of representation becomes petrified, as it were, by the chain of action. In Michael Roth's own words: "The nature of the action is of the same type as that of the objects, and therefore both are involved in their mutual interactive stabilization and constitution." And, paraphrasing Ricoeur (1991), he added: "Actions can be interpreted

with the same procedures as texts". The importance of bodily actions for scientists is exactly what Chunglin Kwa proposed in his juxtaposition of Schopenhauer and Popper, the latter prioritising theory and the former searching for "things-in-themselves". While Kwa agreed with Roth about the reciprocal verification of representation and intervention, he was less convinced by the pivotal role given to the natural sciences over the social sciences in "bridging the gap between the material and the representational world". The discussion was continued in the pleasant atmosphere of Restaurant Alacarte, located in the exhibition building of the art nouveau district of Darmstadt.

The final morning began with two presentations and a commentary related to the issue of trans- and interdisciplinarity in the environmental sciences. Thomas Potthast (University of Tübingen) presented a broad range of ideas about "the nature of borders between 'hard science' and 'interdisciplinary' approaches in ecology" and the environmental sciences. He focussed on epistemological ontologies as borders and on epistemic-moral and epistemic-political boundaries and hybrids, having first clarified what is meant by ecology as hard science and by ecological inter- and transdisciplinarity, "the $n > 1$ disciplinarity". Rounding off this part of his discussion, he presented a selection of responses relating to this issue in the scientific community, varying from cynical to melancholic. Potthast distinguished three different kinds of epistemological ontologies of borders, each of which dealt with the fact-value border in different ways: firstly, ecological political scientism (naturalism) versus Weberian hard science *within* hard science; secondly, dualism versus interdisciplinarity; and, finally, " $n > 1$ Monism versus political ecology *within* $n > 1$ disciplines." He then introduced the epistemic-moral hybrid⁷ as an analytical category that allows for specific conjunctions and is therefore able to overcome traditional claims of universalism and unity. These might be conjunctions of, say, scientific concepts, theories and practices, or of ethical implications and norms for action. In the end he displayed the agenda of the epistemic-moral hybrid that should allow for explaining the implicit and for "critically evaluating different ethoi and morally/ethically normative powers of the context(s)."

In his presentation "bordering environment – investigating the space between science and society" sociologist Christian Pohl (Swiss Federal Institute of Technology in Zürich)

concentrated on the conceptualisation of the transformation from normal science (mode1) towards post-normal science (mode2) (e.g. Gibbons et al. 1994, Nowotny et al. 2001). To begin with, Pohl provided us with an empirical study on the sources of new forms of knowledge that are supposedly characterised by their robustness and local specification – and not by universality, truth or ethical neutrality. For his analysis, Pohl investigated environmental and sustainability research programmes (SPPE, MISTRA) using a ‘model’ of policy cultures (Elzinga 1997, Jasanoff and Wynne 1998) and distinguishing three axes of input into science: the state (regulation), the economy (selling) and civil society (participation). On all three axes he was able to find projects that inform science (waste technology, air pollution abatement, coastal management), whereas projects on soil remediation, say, or biodiversity did not mix. On the basis of these facts Pohl went into more detail regarding the particular conceptual challenges posed by the predicated transformation from “clear dichotomies to a mess, truth to usefulness or helpfulness, certain knowledge to uncertainty management, universal to contextual knowledge”. While pinpointing the conceptual underdevelopment of the concept “mode 2” Pohl suggested that it was necessary to differentiate between three forms of knowledge: first, “transformation knowledge”, which is aimed at embedding technical, social or cultural changes in existing technologies and power relations; second, “system knowledge”, which enables reflection on and ways of dealing with uncertainty; third, “target knowledge”, which tackles the plurality of norms and values and aims at “clarifying and setting priorities among various values in relation to the common good as a regulatory principle”.⁸ In his comments, Matthew Kearnes appealed emphatically for the politics of mode2, an intervention that opened up an informed and lively discussion.

The final paper of our workshop, given by Andrew Jamison (Aalborg University), followed on seamlessly from the foregoing presentations, as implied by its title “Ecological knowledge in an age of technoscience: New contexts and new challenges”. Jamison started with a short historical reconstruction of the “cultural transformation of environmentalism”, beginning in the 1960s and 1970s with the “making of a movement” and ending up in the 1990s with the programmes on sustainable development, green business and, of course, critical ecology. This transformation might be characterised by changing regimes of knowledge and power: from

industrial “little science” before World War II and military “big science” between the 1940s – 1970s through to commercial “technoscience” from the 1980s onwards. As a result, the type of knowledge that predominated at each stage changed from disciplinary to multidisciplinary to transdisciplinary (or mode 2) forms. With regard to the most important milestones in the transformation from big science to technoscience, Jamison identified a general change in range and scope, orientation towards the market, university-industry collaborations, “hybrid identities” and, finally, the state as strategist. In the remaining part of his talk, he dealt with the question of what this might imply for the production of ecological knowledge and sketched out a hybridisation on various levels: hybrid competencies created by mixing skills and theories in new combinations; hybrid concepts that migrate through different societal groups and areas, such as economics, design, citizenry and science; and hybrid applications, such as green business and sustainable communities.

Concluding the principal part of the workshop “Building on Borders”, Astrid Schwarz reminded the participants once again of the aims of the workshop and proposed some preliminary conclusions, but first and foremost some further queries: How might the relationship between ecology and the environmental sciences be most appropriately described? Does the conjunction of the two imply a “versus”, a “part of” or a “transformed into”? How can we make better use of the power of borders and boundaries in dealing with ecological knowledge, especially with regard to environmental policy? Is it possible to capture the positivity of boundaries with concepts such as hybridisation, and of shifting boundaries with concepts such as transformation or transection? What exactly is the difference between these latter and the more spatially penned concepts such as border zone or boundary work? How can we contribute towards promoting a better appreciation of blurred border zones and hybridities in general, be it hybrid identities or hybrid knowledge, both of which are necessarily part of producing ecological knowledge?

The final part of the workshop was dedicated to a presentation, discussion and updating of the HOEK project (Handbook of Ecological Concepts) that provided the framework for our workshop. Several of the workshop participants are already involved in the project, and, this workshop, along with the two foregoing ones, is also intended to contribute to the project in some way or another. The objective of the HOEK is to

write a philosophically and historically informed six-volume handbook for a broad based readership. To fulfil this objective it needs both the support and the contributions of the scientific community as well as the public. The first volume is expected to appear in print early in 2007. Its title is "Revisiting Ecology. Reflecting Concepts, Advancing Science", edited by Astrid E. Schwarz and Kurt Jax. The second volume will follow in 2008, "Ecological Units", to be edited by Kurt Jax and Astrid E. Schwarz. More information about the project is available on the project's website: www.hoekweb.net.

Notes

- 1 The workshop was generously supported by the Volkswagen Foundation (project number AzII/81985).
- 2 Kant, Immanuel, *Beschluß von der Grenzbestimmung der reinen Vernunft*, Kant Werke Vol. V, 229.
- ³ Think of for instance Meadow's book "limits of growth" or Carson's "Silent Spring".
- 4 Gieryn, Thomas (1983): *Boundary work and the demarcation of science from non-science: strains and interests in professional ideologies of scientists*. – *American Sociological Review* (48) pp. 781-795; Leigh Star, Susan, Griesemer, James R. (1989): *Institutional ecology, 'translations' and boundary objects: amateurs and professionals in Berkeley's museum of vertebrate zoology, 1907-39*. – *Social*

- Studies of Science* (19) pp. 387-420; Galison, Peter, Stump, David J. (ed.) (1996): *The Disunity of Science. Boundaries, contexts, and power*. Stanford: Stanford University Press; Kohler, Robert E. (2002): *Landscapes and labs: Exploring the lab-field frontier in biology*. Chicago: The University of Chicago Press.
- 5 Martinez, Oscar (1994): *The dynamics of border interaction. New approaches to border analysis*. In: Shofield, Clive H. (ed.): *Global boundaries*. London: Routledge.
- 6 In a paper on interdisciplinary work, Sandra Bell and her collaborators discuss different methods and strategies not only to follow but also to shape "the process of interdisciplinary work by documenting the experiences, thoughts, perceptions, ideas and concerns of researchers working in interdisciplinary projects". Marzano, M., Carss, D.N., Bell, S.: *Working to make interdisciplinarity work: investing in communication and interpersonal relationships*. – *Journal of Agricultural Economics*. In press.
- 7 Potthast, Thomas (2001): *Gefährliche Ganzheitsbetrachtung oder geeinte Wissenschaft von Leben und Umwelt? Epistemisch-moralische Hybride in der deutschen Ökologie 1925-1955*. – *Verhandlungen zur Geschichte und Theorie der Biologie* (7) pp. 69-89.
- 8 For more details see the recently published book "Gestaltungsprinzipien für die transdisziplinäre Forschung - Ein Beitrag des td-net", Pohl, Christian and Hirsch Hadorn, Gertrude 2006. Munich: ökom Verlag.

Recent Dissertations

Adrian Ely, *Regulatory Appraisals of Bt Maize – A Study of Science in Governance*. DPhil in Science and Technology Policy, July 2006, SPRU, University of Sussex, UK

The governance of modern agricultural biotechnology has been the focus of considerable study over the last three decades. Alongside critical scientific analyses of the environmental impacts of genetically modified crops and political-economic studies aiming to explain national policies, research drawing on the resources provided by science and technology

studies has contributed significantly to our understanding in the field. In this thesis I adopt a comparative approach to investigate the ways in which scientific evidence has been used in regulatory appraisals of the cultivation of transgenic Cry1Ab Bt maize (corn) in the United States of America, France, the United Kingdom and Austria. I find that expert groups in each country have used different approaches to the selection and interpretation of scientific knowledge in order to inform and defend national policies on the environmental release of the crop. These different approaches can be

linked to the prevailing institutional contexts, including legal frameworks and political conditions, in which expertise has been employed.

After an introductory chapter, I set out the theoretical framework that informs the subsequent interdisciplinary analysis of the role of science in governance. The thesis draws on both realist and constructivist studies of regulatory science, and uses a typology to interpret and characterise expert assessments, as evidenced from documentary and interview data.

Rather than adopting the notion of *risk* to describe the absence of scientific uncertainty that has characterised these debates, it uses Stirling's term *incertitude* and within this distinguishes between four types of state of knowledge. These are: *risk* (when we have knowledge of probabilities and consequences) *uncertainty* (when we understand the consequences of an event but are unable to assign a probability to its occurrence), *ambiguity* (when we are able to assign probabilities, however the consequences of an event are unknown or contested) and *ignorance* (when we lack an understanding of both probabilities and consequences, for example in situations when we do not know what we do not know).

The third chapter outlines the development of the regulatory frameworks for the cultivation of transgenic crops. Highlighting the US "product" and EU "process"-based approaches that diverged from 1986 onwards, I discuss the ways in which these influenced subsequent developments at the national level. Specific policy decisions around Bt maize are described against a background of national institutional and political contexts.

Within the case study of Bt maize, I focus my analysis on two risk issues – 1) effects of Bt maize on populations of non-target organisms and 2) development of target insect resistance to the Bt toxin contained within the transgenic maize. The following two chapters of the thesis analyse the scientific evidence in regulatory dossiers presented by firms, and the new scientific findings in these two areas that emerged from the mid-1990s to 2005. An examination of the regulatory dossiers (for maize

lines Bt176, Mon810 and Bt11) uncovers different approaches to constructing assessments of zero or negligible *risk* associated with each of the risk issues. Generally, firms constructed *risk* around the issue of non-target impacts by drawing on approaches previously used with conventional pesticides, such as laboratory toxicity tests on representative species, to highlight negligible hazard (and thus negligible consequences). They drew on indirect evidence (from different insect species models) and relied on resistance management strategies to construct assessments of low probability of insect resistance emerging in cornborers, the target pest.

Despite some firms' normative assertions that resistance would be acceptable, the consequences of resistance emergence maintained some degree of *ambiguity*. Firms' approaches to constructing *risk* were initially accepted in all countries studied apart from Austria. Chapters 4 and 5 examine Austria's scientific reasons for rejecting the cultivation of the products, illustrating how these constructed *uncertainty*, *ambiguity* and *ignorance*.

In the concluding chapter I summarise the approaches to constructing different forms of *incertitude* around each risk issue. I argue that divergent legal and institutional frameworks afforded expert groups in the different jurisdictions varying degrees of flexibility in the selection and interpretation of scientific evidence, and illustrate how types of *incertitude* and governance arrangements are co-produced. The findings have implications for understanding the causes of regulatory divergence, such as that which led to the recent World Trade Organisation dispute over GM food and crops.

Adrian Ely's doctoral research was funded by an interdisciplinary studentship from the UK's Natural Environment Research Council (NERC) and Economic and Social Research Council (ESRC). During the course of his research, he benefited from periods spent as a visiting fellow at INRA (Ivry-sur-Seine, France), IFZ (Graz, Austria) and the Program on Science, Technology and Society at the Kennedy School of Government (Harvard University, USA).

A Farewell from your Editor

With some sadness I am finally handing over the Editorship of the EASST Review. Sixteen volumes, 54 issues, with between 20 and 64 pages, "hand produced" with the simplest of graphical techniques, have left my personal computer. The resulting paper journal was not without attractiveness, I dare say. Of course, the journal has not been my own making. A large number of authors (I didn't count them...) contributed book reviews, discussion articles, reports, and kept alive the social and scholarly life of our Association in-between the EASST and joint EASST/4Sconferences. The Contributing Editors have been invaluable. Janet Rachel Low and Gerald Wagner wrote a number of spirited pieces around 1996 - we were all sad when Janet discontinued her "Letters from London". Paul Wouters, from time to time, flashed a spotlight on the scientometric tradition, usually when we thought it had passed away. In recent years, Harald Rohrer infused the

Review with new energy from central and east Europe. Andy Jamison has been steadfastly contributing from the early years of my Editorship until this very last issue, with pieces that were always opinionated, very well written and very informative. My warmest thanks, however, go to Richard Rogers, the "Deputy". He turned compiling a Conference Announcements section into an art. Very often, when I thought I had composed a balanced issue rich in content, most of the compliments I received were for the conference section. And lest anyone would think Richard's contributions were limited to assembling announcements, let me just mention that the EASST Review had a first on the now world-famous Issue Crawler.

Fortunately, Christine Hine found a successor. I am glad we have a enthusiastic new Editor, who is already setting ambitious new goals for the Review. Ann, I hope you will enjoy the Review as much as I did.

Chunglin Kwa

STS? But Is It: Science? Math? Art? Some random and personal impressions from EASST 2006 @ Lausanne

Your tireless editor through the years, Chunglin Kwa, has finally decided to spend his energies on other tasks. And though I'm already tired to begin with, I've decided to try to fill the post. Somehow, watching Chunglin rise to the challenge over and over has given me the courage to try. And that decision has given me the courage to try my hand at an EASST conference "travelogue" report. After all, one of the recurrent

problems Chunglin faced was a shortage (at times) of contributions to the Review. And I am one of the guilty parties. I have never, before now, contributed. So, as a final gesture of gratitude to Chunglin, as a last-minute effort to build some moral standing now that I'll be taking over at inviting others to contribute, as a self-introduction from the in-coming editor to the readership, and simply because I found it added

extra enjoyment to the conference once I'd made the decision to write about it ... here is my EASST 2006 conference travelogue:

4S and EASST conferences change "flavour" from year to year. The changes reflect shifts in research approaches (dare I say "fashions"?), perhaps also Kuhn-ian shifts between periods of normal science and years marking rapid changes. 4S and EASST conferences also have different flavours from person to person. Any given conference may seem boring, narrow, off-target, diffuse etc. to some and exciting, focused, relevant, varied etc. to others.

To me, this year's EASST conference was exhilarating, but also exhausting. The organizers had chosen a topic that, even as it was central to current STS discourses, also brought in hundreds of new participants with fresh perspectives. This was not merely the desired yet arbitrary effect of potential participants' responses to the call for papers; it was also emphasized in the structure of the plenary sessions. These were set up as insider/outsider reflections on STS meta-themes. Each morning or evening there was a plenary session where we were challenged to (re-)think questions such as "What is STS's frontier?" "What are our questions?" "What sites should we focus on?" "Where do we go from here" and "Might the way forward involve taking a step back to rethink what we've come to take for granted?" And then, to top it all off, we were challenged to follow a Swiss work ethic by starting our mornings early and maintaining momentum 'til late. Luckily the cafeteria sold good strong espresso drinks to keep my eyes open.

The challenge to look back and rethink former choices was a recurrent one for me throughout the conference. For instance, at one point my notes show that my thoughts were steered back to the York conference. Are there many out there who remember Steve Woolgar's session on accountancy? I recall taking the role of a rather rude, snippety commentator at the time. Sorry about that, Steve. My choices then are now coming back to haunt me. Back then I thought Steve was just going on a rant about the nuisance of filling in forms. I challenged him to offer a more thorough constructivist analysis of what all those forms entailed: How are they weaving together the State, the public, and Academe? Are they democratizing Science? Are they distorting it? Now, four years later, the distortions are becoming clearer to me. Steve, are you ready to go back and update and revise that paper?

Of course, not all my reflections were coloured

by regrets. I found my choice of research project confirmed time and again. My decision, a year or so ago now, to start a large project on the micro-practices of statistics - statistics' role(s) in governance, the choice(s) to categorize citizens according to race/ethnicity (or not), the collection and deployment of crime statistics, the integration of statistics into diagnostics, and so on - has been resonating with more and more papers and lectures at STS events. Of course, my team and I still have a lot of work to do before we see whether our results and analyses will meet with expectations, but at least we no longer feel alone with a topic others have finished with. Now we realize we are in a well-populated area that many have re-discovered as not yet completely explored.

Another aspect of this year's conference "flavour" was that my reflections kept following parallel paths: "But is it STS?" "But is it Science?" "But is it math?" "But is it art?" Of course, the plenaries were meant to make us ask such questions, and did so effectively. No wonder then that the questions stuck with me as I attended paper sessions. But it does speak to the consistency of the organizers' vision that even the cultural event reinforced this pattern. Not just for me, I might add. In fact, not directly for me at all. I was exhausted and left early, but I heard others the next day reflecting on whether a woman screaming was art, whether the performances they liked were more entitled to be called "art" than those they disliked, and in extension of such questions - what made a performance "art" or qualified it to that term?

We might also ask what it is that makes a conference. One answer is certainly the efforts of the organizers and programme committee. Many thanks to them all! Another answer is that the participants make the conference. As I have come to expect, STS conferences, however large they may grow, are particularly congenial ones. Papers get commented constructively. Professors and students mingle, listen to, and speak with one another freely as colleagues within the field. Thanks too, then, to all attendees! The only destructive presence is the ghostly one of those who - having submitted abstracts and session programs and registered for the conference - nevertheless fail to attend. How rude to simply fail to show up! How inconsiderate to leave an audience sitting there waiting, missing their chance to hear other papers! Shame on you (you know who you are). Yes, you may have had a good reason. Perhaps you or a loved one fell ill. Perhaps you were frightened away by recent news of terrorist plots. Perhaps you simply ran

out of time and didn't get your paper written (well, that's not a particularly good reason, but I guess it happens). So no, we don't expect 100% attendance. Non-attendance in itself is nothing to be ashamed of. But next time you realize you won't be attending, at least send a message to the organizers so they can announce a program

change.

Looking forward to hearing from you, and to seeing you at future conferences!

Your new editor,

Ann Rudinow Saetnan

The Duration of the Present and the Risk of Not Telling Large Stories

by Lars Risan

Centre for Technology, Innovation and Culture, University of Oslo

A Comment on The Plenary EASST-Debate on Technological Determinism

At one of the plenaries at the EASST-conference in Lausanne this year Sally Wyatt asked us – the STS-community – to rethink “technological determinism”, not because we need to redo “our” understanding of its falsity, but because it is still alive and kicking “out there”. As a social fact, as an epistemic reality, an instance of what anthropologists recognise as an *emical category*, it still makes a difference. On the train back home from Lausanne, I picked up on Wyatt's invitation, and started to think, ontologically, about technological determinism and the nature of *time*, or *times*. Not of “spaces”, as the conference was dedicated to, and that much of STS-research has been so devoted to for a long time now. I thought about times and their durations, on that Swiss train that I will return to in a moment, and the Whiteheadian understanding of time as a succession of durations rather than a succession of moments. Technological determinism is the belief in the technological inevitability of historical development, and thus, somehow, the inevitability of the future, given a particular technology. To understand the duration of the present then, is crucial if we want to say

something about technological determinism, because, somehow, at the end of the present lies the future.

I also started to think about the politics of “technological determinism”, and in particular the politics in the widespread STS-scepticism towards this large, fuzzy beast. Perhaps we are not always political responsible in our rejection of it.

The event at EASST 2006

The event that set off this little cosmopolitical speculation was the plenary session around Stephen Graham's paper *Software-Sorted Technologies: On Space, Technology and Inequality* (Graham 2005). The paper was commented by Sally Wyatt and later discussed by the plenary and particularly commented upon by John Law. Here is a summary of the central arguments of the event:

Stephen Graham, invited to be “external” to STS, first presented his paper on “software sorted technologies”. (Or really, he did not present his paper, he had it “ghost read” by one of the conference-organisers, because he himself was home with a flue.) In short, Graham's paper explored, quoting its abstract: “the central role of computerized code in shaping the social and geographical politics of inequality in advanced

societies ...” (Graham 2005: 1) It did so by presenting three different cases. The clear political message of the paper was that the production and reproduction of various social inequalities, by means of software and digital technology, is *worrying*. The paper is a warning of a present and possible future *risk*. The discussion afterwards revolved around last of Graham's three cases, future, computerized face recognition, using public surveillance cameras. These cameras are most often monitored manually. That is, some person has to sit down and actually look at the filmed material, live or recorded. There is however an emerging technology that can recognise people's faces automatically, by means of computer programs. Wanted persons can thus be found automatically. This technology is developed to find people whose faces have already been scanned and stored in databases, but it is also developed to find “suspect” persons in general, using artificial intelligence to look for generally “deviant” behaviours. Moreover, the cameras “tends also to be used”, to quote Graham, to scan people's faces without their consent, presumably to build databases of faces, later to be used to find people who were not known to be doing anything wrong when their faces were scanned. There is a “very real risk” that camera systems that are now isolated will be integrated into “massive and geographically-stretched facial recognition CCTV systems” (Graham, 2005: **)

After Graham's presentation, the “internal STSer, Sally Wyatt for this occasion, presented what she called the “usual STS-criticism” of such stories, namely that these stories tend to take the advent of some technologically produced future for granted, and that they are de-contextualised. That is, they are typical stories of technological determinism. However, rather than just dismissing Graham as “wrong”, Wyatt made the general point that we need to understand the way in which such notions of determinacy works, without judging their ontological truthfulness.

In the plenary discussion afterwards John Law further discussed the problems of the possible determinism of Graham's paper. I'll only repeat his last argument here, concerning the critical stance of Graham. Law was worried that by telling such large scaled “critical stories” one runs the risk of colluding with the advocates of these systems, because one basically agrees about what these systems can “really do”, and in how massively they can do it. The only difference between the advocate and the critic is that the former wants the system whereas the latter fears it. But they agree on what the system

really is, will be or can be. This collusion between the critic and the advocate, then, closes the a space for a possible criticism, a criticism that might constructively try to see other realities, more desirable realities. Thus, the mega-machine that Graham fears is unattainable to the common deadly who might want to make a contribution – small but possible – to a better world.

I do very often share this argument with John Law. To take a personal example: I am worried about the way in which large computer corporations (notably Microsoft) work to monopolise the communication standards, the infrastructure, of the Internet. But I have not started to study this by investigating Microsoft. Rather I have started a study of some parts of the diverse group of computer activists, often known as “hackers”, who work relentlessly and in large varieties of ways – commercially, technically and politically – to undo that monopoly. So I am STSer enough to believe in the usefulness of the small stories. By telling stories of hackers and Free Software, I hope to help redo received stories about who is big and small. Moreover I hope to do that in ways that do not reify sides of good and evil, as it is now the case that the “hacking” of Free Software includes million-dollar investments from companies like Sun Microsystems, Novell and IBM, in cooperation with large public bodies, such as the Brazilian government. But still also in cooperation with non-profit organizations such as Free Software Foundation.

But then, I am not sure if it is always a good idea to tell the small stories rather than the large ones. I'm not sure it is always the responsible thing to do, and I am not sure if it was a bad idea of Graham to tell his story the way he did. Here, at least, is a partial defence of his paper. First I'll do a little Whiteheadian inspired discussion of what technological determinism may be, and not be. Then I'll look at some alternative political implications of writing in the style of Graham rather than in the style of Law.

The ontology of time

To Whitehead, time, or rather space-time, is always made up of “atoms” that have a real substantial existence. Points in space and moments in time are just limits, mere relations, in themselves with nothing to make relations between. Points and moments then, exists as limits between something and something else, some things substantial, some things that have extensions in space and time. Time is not made up of a moment that travels on a time-line. It is made up of “chunks” of space-time, that is of

actual events (Whitehead 1926: 158-159). These “things” are atomic to Whitehead, they are “building blocks” in a monadological universe. But unlike the undividable classical atom, the atom of Whitehead is always dividable. Time and space can always be divided into smaller parts, but these parts will always be substantial things, “gatherings” as Bruno Latour would say, always drawn together and always substantial.

Now, the reader may not believe in this Whiteheadian conception of space-time, but this is not the place to run a long argument in to show the soundness of this metaphysics. So I will just have to ask you to entertain the metaphysical premise of seeing space-time as made up of substantial atoms, atoms that are always drawn together in events, “prehended” in Whiteheadian vocabulary, and that are therefore always dividable.

If time-space atoms may vary in size, they may also be *large*. The question, in relation to technological determinism, then, is this: *How long does the present last?* How *large* is the present? This is a relevant question because if we want to understand what the allegedly inevitability of the future might be, we need to sort future from present. Here is an extreme case to think with, in thinking about technological determinism:

I left EASST 2006 to go to Geneva airport by train, and started doing this speculation. The train was scheduled to leave Lausanne at 16:17 and to arrive Geneva Airport 43 minutes later. I had reasons to believe it would be fairly on time in Lausanne and actually use about 43 minutes (being in Switzerland ...). The train was on time and it used 43 minutes.

Was I being a “technological determinist” in believing in the inevitable and technologically determined unfolding of a future, a future “determined” by the Swiss railway system? No, I think I was not. This is not what we mean by that term. So, then, how do we analytically separate the possible or impossible inevitability of the future from a case such as the stability of the Swiss railway system? I suggest we do it by separating the (alleged) inevitability of the future from the *inevitability of the present*. There is such a thing as the inevitability of the present. The present is inevitably here. Thus, when travelling with a train in Switzerland, the whole trip is part of a present. The event or duration, the “chunk of time”, that is the present in relation to such a trip includes the whole trip. This present is not a given. It is an achievement, an achievement of the Swiss railway system (In Britain it is not the same kind of achievement, and the present is

a different thing when travelling with trains in the UK). Doing the trip from Lausanne to Geneva was an *unfolding of a present*. And the present *has to unfold*, as it is not a moment, but a duration.

The making into unity, the work and achievement of a “gathering” which by STS-researchers is studied in detail – such as the one Latour describes, for example in the unity (and disunification) of the Challenger space shuttle (Latour 2004), or the “coordination work” that Mol describes in the unification of a disease (Mol 2002) – are not only spacial unifications. They are also a temporal unifications, “prehensions”, graspings into unities of durations, in Whitehead's terms. They are unification of *presences*. Presences can always be divided in smaller presences, as atoms are dividable. Thus presences can also be unified into larger presences. And in relation to the arbitrary scale of the life of a human being, these presences might well be long.

If, then, we want to criticise technological determinism, we should not criticise descriptions when they describe an unfolding of a present, even when that present consists of a long chunk of time, like, say, 20 years (“cars and roads will still be the dominant machinery of transportation in 20 years time”).

If, however, we want to argue that a particular unfolding of events is an unfolding of a present time, we have to argue the case empirically. It cannot be assumed. And the arguing may be difficult and uncertain. There are epistemic uncertainties: often we may not now – because we have not figured it out – if some event belongs to the present or the future. And there are ontological uncertainties, notably in accidents when the future interrupts the present: An accident occurs to the train, even the Swiss one. To the dedicated determinist these two uncertainties are really the same: “Perfect knowledge” would not only annihilate epistemic uncertainty, but also ontological uncertainty, as all possible accidents could be foreseen and avoided. Thus, to the dedicated determinist the future could in principle implode into an eternal present. We are always within this present. There is really no future to the determinist, only a never ending unfolding of the spacial and temporal unity that we call the present.

The present and future of CCTV

In relation to Graham fear of the allegedly coming of new systems for electronic face recognition we may thus ask: Does Graham describes the unfolding of a present, or does he

speculate or make unjustified claims about an uncertain and open future?

There are good empirical reasons to argue that he is at least partly describing a present, at least if we stick to the UK. Several UK-firms are now selling fully operating and stable face-recognition systems.¹ Aurora Computer Services Ltd. claims that their 3D scanning of faces are extremely reliable: "We can't say it's 100% but we've done tests and have a zero failure rate." These systems are installed many places in the world, with Heathrow as one of the likely next customers. The new UK-biometric passport (and the EU passport to come) holds electronic information about the face of the holder, and the image of the holder is stored electronically.²

Some of the possible technology that Graham describes may belong to an uncertain future, like the machine-intelligent recognition of "suspect" behaviours (as opposed to the recognition of already electronically known and wanted people). Some of the technology most certainly belongs to an unfolding present, even if it may not yet be in place. It is unjustified to dismiss this unfolding as "technological determinism". It is also unjustified to "understand" this determinism emically (i.e. symmetrically with respect to its truth or falsity) as Wyatt suggest, because it might not be technological determinism at all.

Moreover, in one important way we do not have to settle if some of the technologies that Graham describes belongs to an uncertain future or an unfolding present. He is presenting a scenario, a possibility, a risk. (This is more clear to me after having read his paper than after having heard his paper presented.) And so we might ask if presenting this scenario is a Good and Critical thing to do, or if it, as Law worried about, is to collude with those he want to criticise. And if the telling of other stories, smaller, more diverse stories, is the more responsible option.

I do not want to choose between these two options. I want to have both, at least sometimes. And I'll argue the case by reference to an example that I know better than surveillance by CCTV, namely the free software movement. Free or Open Source Software, in short, is software that is owned differently than proprietary software. All users of Free Software have the right and possibility (given their own skills) to change this software, and they have the juridical right to *own* their own changes – but only their own changes, not the whole program. Free Software has grown into a big thing. 70 % of all servers on the Internet run the Free Software server program known as *Apache*. As I mentioned above, hackers of all sorts, that is

those who make Free Software – the nerdy "geeks", both at universities, at home and in large corporations – strongly dislike the communication monopoly of the large software companies, notably Microsoft these days, but increasingly also Apple through their ipod.

Here is a brief example of such ownership; the text editor *Word*. We all send Word-documents to each other. It is a wonderful thing that "we all" (that is: most of academia) can open and read these documents. Word, then, is a communication standard. But the way a word-document is technically structured is a business secret of Microsoft, controlled by Microsoft. To most end users Word is naturalised. To hackers it is not. That is partly because hackers run Linux on their PCs and have been confronted with the hassle of opening word-documents, partly because the very communication standards of the Net is something that they care most passionately about.

Unix-hackers have for a long time disliked the MS Word-format, for its technical inaccessibility. The last 5 years or so, they have got company by an increasing groups of academic lawyers and politicians who have come to understand the democratic problems of letting single corporations control public communications standards. A political change is under way many places. Sun Microsystems has now made an open standard for word-like documents, called the Open Document Format (ODT). This format is now ISO-certified as a public standard, and activist, academics and politicians are working to make it into a practised reality.

The MS Word-document format is only one of many commercially owned communication formats that are politically and technically challenged by hacker-activists.

Now, an important backdrop for much of the hacker-activism is a great aversion to Microsoft. Microsoft is "evil", or at least dangerous, and there are, and have been for a long time, a lot of "large stories" out there who describes this danger. These stories are not very different in their structure form the story Graham told about CCTV. They tell about one "monstrous" beast. They don't contextualise. They do not tell about how Microsoft users appropriate Windows in a great variety of ways. One could, following John Law, tell of the fluidity of Windows, just as de Laet and Mol have done very nicely about the Zimbabwe Bush Pump (de Laet and Mol 2000). In ways similar to this water pump, Windows have become a global technology not by being an "immutable mobile", but by being a *mutable*

mobile. Windows is “fluid”: It has been hacked, pirated and tweaked all around the world from Brazil to China. The users of Windows are not, generally, passive victims of an “evil empire”.

There are probably times and places where a possible story about the fluidity of Windows would be a Good Thing. But there are probably also places where it would *not* be a Good Thing. The critical stories of “Microsoft the Monster” have fuelled a productive hacker activism. What would a story about the fluidity of Windows produce? Legitimacy to Microsoft? Who, then, runs the risk of colluding with the Bad Guys? And, returning to Stephen Graham's paper, in the case of computerised face recognition, who is colluding with the Bad Guys when Graham's worry is dismissed as “technological determinism”?

I am not asking these rhetorical questions simply to take the side of good old fashioned criticism, against STS. I just think that sometimes we need the one, other times the other. Large, “de-contextualised” stories may describe large events, large drawings together into unities of large present times. Describing them is describing a “here and now”, not determining a future, even when they are stretched out in time.

Notes

1 For instance Aurora (<http://www.facerec.com/company.html>) and Dectel (http://www.dectel.co.uk/prod_ss_facialrec.asp).

2 See <http://news.bbc.co.uk/1/hi/magazine/4035285.stm>
See <http://www.urban75.com/Action/cctv.html> See <http://news.bbc.co.uk/1/hi/uk/4776562.stm>

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Reviewing Humanness: Bodies, Technologies And Spaces

by Peta S. Cook

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A Report of the EASST Conference 2006, University of Lausanne, Switzerland, 23 - 26 August 2006

For some time, I have been looking forward to

attending an EASST conference. As a PhD candidate living in Australia, however, I knew it would be financially difficult. Like many Australian science and technology scholars (though we are few in number, we are expanding

and growing), I often feel isolated from the STS community. Therefore, when I received financial support in the form of an EASST travel stipend, as well as from my home institution the Queensland University of Technology, I grew excited.

My eagerness translated to a thorough examination of the EASST conference programme far in advance. Scanning the programme, an immediate problem hit me - with the overwhelming amount of engaging STS work, how was I to pick which session to attend? As a result, I attended as many sessions as I possibly could. What follows is my summary of a few select presentations.

You will note that I have chosen not to focus on the plenary sessions. This is because of two reasons - one, excellent outlines are provided in the conference proceedings and two, the plenary sessions enjoyed mass attendance. Suffice to say that in the plenary sessions, a general strong theme emerged, where a strong concern was expressed regarding the intersection of STS and the dynamics between science, the state, democracy, politics, globalisation and humanness.

I am a little biased towards the first paper presentations held on Wednesday 23rd August, as this is when my paper was allocated. My presentation, entitled "Overcoming and Reinforcing Dichotomies: The Animal/Human Divide and Xenotransplantation", was the first time I have presented work emerging from my near-completed PhD thesis. EASST was a perfect opportunity to debut my examinations to a wide and divergent STS audience. Drawing upon primary qualitative data collected through document analysis, focus groups and interviews, I outlined how negotiations of animals in xenotransplantation are not straightforward. That is to say, while xenotransplantation (animal-to-human transplantation) merges animals and humans together to create a hybrid body, such medical intervention can only happen by conceptualising animal and human bodies as different and similar at the same time. Presenting my work to the international STS community was an invaluable experience, and I had many conversations about my work with various colleagues during the conference.

As I lecture on the sociology of the body and its intersections with technoscience, it was imperative to attend the session on the body on Thursday 24th August. Julie Palmer from the University of York focused on feminist debates on ultrasound imaging. Currently, feminist debates have not extended into the latest 3D and

4D ultrasound technologies, which pose new challenges for reading foetal personhood, or the 'technofoetus'. The constructed nature of the 3D and 4D technofoetus provides depth and perspective through the use of contrast, which gives a sense of a whole body and reinforces personhood. Like previous ultrasound technologies, we witness the disappearance of the woman by focusing on the foetus. Simon Carter from Open University then provided a preview of his upcoming book in his presentation, "Rise and Shine: Sunshine, technology and health". Using historical examples, Carter showed how tensions manifested between shading the body from the sun and the importance of sunlight for health. An example of such is rickets, which was traditionally viewed as a symptom of a lack of sunlight; above and beyond diet and vitamin deficiency. Clear intersections can be seen between 'sun-seeking' for health and the development of medical tourism.

On Friday 25th August, Suzanne Laberge, Mathieu Albert and Brian Hodges explored interdisciplinary research in the Canadian context. The trend of funding agencies towards interdisciplinary research in Canada, which is viewed as more superior to disciplinary research, is reflected in changes to academic programs. Generally biomedical scientists felt the pressure for interdisciplinary research was too great, and exhibited mixed feelings about whether interdisciplinary research enhances understanding. Not surprisingly to the audience present, biomedical researchers largely did not view social science epistemologies and methodologies in a favourable light. Hopefully, this will continue to change in the future.

The presentations on the final day of the conference did not disappoint, as reflected in a continued strong attendance of conference delegates. Suzanne Fraser, from the National Centre in HIV Social Research at the University of New South Wales (Australia), discussed her recent publication, "The chronotope of the queue: Methadone maintenance treatment and the production of time, space and subjects". Fraser's focus is on how time and space of the queue at methadone clinics, co-produces particular kinds of methadone subjects. For example, queuing requires methadone clients to spend time with each other, which may create difficulty for some clients by subjecting them to danger. Discussions about criminal activity and mixing with individuals suffering from withdrawal, pose threats to personal security. Additionally, limited opening hours of clinics and the consequent

queuing, impacts upon the client's life, such as raising children, limiting work opportunities and/or generating tardiness for work. Even when not queuing, individuals can be attacked due to queue negotiation when leaving the clinic.

As a final presentation in the paper sessions, Rob Hagendijk, Alan Irwin and Maja Horst outlined the STAGE project (Science, Technology and Governance in Europe). Based on twenty-six case studies of policy making and social engagement across the European Union between 2001 and 2005, STAGE concentrates on information and communication technologies, biotechnology and the environment. This examination shows how public engagement in science - or 'deliberative governance' - continues to be underdeveloped, imprecise, ill-defined, fluid and contested. These challenges should not discourage us however, as we should continue to seek and be committed to public engagements. These case studies and further information on the project can be found at [http://www.stage-](http://www.stage-research.net)

[research.net](http://www.stage-research.net).

I would like to take this opportunity to express my gratitude to the EASST Committee and the Research Degrees Committee of the Queensland University of Technology for the financial support that enabled my attendance at EASST 2006. Without such support, my attendance would not have been possible. Presenting and discussing my work to the EASST community was an invaluable experience, enabling me to solidify existing networks while establishing new ones. The EASST Organisation and Programme Committees must also be acknowledged for a job well done. And finally, thanks to Judith Halberstam, I will never watch *The March of the Penguins* (or 'Penguin Porn') in the same way again.

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Frankenstein's Muse

by Laura Watts

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A report from EASST 2006, University of Lausanne

Frankenstein was born in Lausanne, some say. Beached on the stone shore of the lake, before the feet of Mary Shelley, he whispered of a techno-organic creation, a monster of spark and flesh. Lausanne is an apt place for stories of the techno-organic dead, a hybrid morbidity for which practitioners and dilettantes of Science and Technology Studies have a particular penchant. The *Reviewing [of] Humanness: Bodies, Technologies and Spaces* was, for me, a story sewn together from monsters, hybrids, bodies and cadavers...

I travelled EAS[S]T, towards the rising summer sun; train flickering over the high-speed plains and grass seas of France and Switzerland. I remember arriving into a glaze of hot blue sunlight that had long since faded the distant mountain-sides and sunflower fields; the land

was failing with the season. The glory of those stark mountain peaks, far beyond the lake, was no longer spring-crisp but ethereal, even, dare I say it, Olympic. I often sat on those boulders/sculptures outside the glass walls of the university (a natural-cultural landscape, it must here be noted) and watched those mountains fading, dying in the sun-mist air.

The hybrid morbidity began with the skull of a child, a 19th Century phantasmagoria of the inside of a brain; the desire to un-stitch the flesh and see the electricity of thought within. This was the story told by Michael Hagner, perhaps inspired by the whisperings of Frankenstein nearby. The technologically-infected carcasses began to pile high when John Law marked and re-marked the line between life and death for cattle and sheep during the UK Foot & Mouth epidemic. His was a gagging story of pyres of animals burned by database – "carnage by computer". Above these Rachel Prentice then

threw the digitally-thin cadavers of the US National Library of Medicine's Visible Human Male and Visible Human Female. Two dead bodies that were neatly sliced and then categorised into the appropriate sectors of a set of CDROMs; death transmuted into living digital bits. Two bodies that had conveniently died by lethal injection on death-row so that there would be no scar, no visible sign of death to mark the visible body. Two immortal bodies; dead monsters, some might say, made undead.

And then there was the most terrible techno-organic death of all: that of story itself, killed by DVD. Michael Christie (and the ghost of Helen Verran) spoke passionately of a software salvation project. For the Yolngu in Northern Australia, story and landscape are alive, ongoing, unfinished. To capture a story of the landscape and burn it alive on DVD is a killing act. The land lives as a local performance; it dies by global database. Yet, Michael told of how performance and partiality *can* be woven into the digital memory of landscape and story. For this was, ultimately, a tale of hope not death, of how to tell landscapes and stories without killing them, how to locally nurture an inseparability of living software, living flesh, and living place. It reminded me that some immutable mobiles die when they are cut off from their roots, and are abandoned unloved in the world. As Bruno Latour chastises the developers of Aramis in his

own dreams of Victor Frankenstein: "your crime is that you abandoned your creation"¹. Some things are close relations, you have to stay with them and let their roots tap down into a particular place for them to truly live; you have to attend to a growing, unpredictable, creative story. Perhaps it is, as Annemarie Mol finally reminded me in her thoughts on healthcare, a matter of tinkering, a matter of *care*, even in death.

And so, as with all old stories, the sun fell into darkness over Lausanne. I travelled home westwards, into twilight and night, and into tomorrow. But the midden of uprooted technobodies was left to haunt me, to tell me stories, as Frankenstein's muse once did. For tomorrow's possibilities belong as much to those whose flesh has rotted into text and textiles, as to the living. Futures are always made, in part, by those who form the stratigraphy for archaeologists, geologists and archivists. It is often their bodies, their techno-organic remains, who inspire the stories to come...

Notes

1 Latour, B. (1996). *Aramis, or the Love of Technology*, London, Harvard University Press, pp 248.

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The South-East European Network for Science and Technology Studies

by Mimi Vasileva and Ivan Tchalakov

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Since September 2005 several research units in South-Eastern Europe (SEE), working in the field of Science and Technology Studies have joint their efforts in a networking project, aiming to boost their cooperation and the development of the field in region. The partners include Inter-University Research Centre For Technology, Work And Culture (IFZ), Graz Austria, Technology Studies Group at Institute of

Sociology (TSG-IS), and Center for science studies and history of science at Bulgarian Academy of Sciences, Centre for Social Studies of Science (CSSS) at University of Ljubljana (Slovenia), Faculty of Architecture at the University of Belgrade (Serbia and Montenegro), Institute of Economics at University "Ss Cyril and Methodius" (Republic of Macedonia) and Faculty of Mining, Geology, and Petroleum

Engineering at University in Zagreb (Croatia). The project was supported by *Program of Research cooperation and networking between Austria and SEE countries* of Austrian Federal Ministry for Education, Science and Culture.

The partners have been motivated by the common understanding that development of South-Eastern European societies will require active strategies to better understand and manage technological change. This is undeniably true for the countries like Slovenia and Bulgaria, which are experiencing sustainable economic growth for more than a decade. In the two countries the introduction of new technologies and innovations is now on the agenda both of private sector and public governance. The development through technologies and innovations is becoming also critical issues for *Western Balkans countries too*, which after decade of wars and instability now are demonstrating and increasing rates of growth. The South-Eastern European countries' adaptation to the knowledge-based economy will require substantial reforms in the inherited educational structures, in the national research organizations, new types of relationships between academic science and industry, including special policies in support of emerging new clusters of high-tech small and medium enterprises.

In most of the developed European countries the STS scholars have significantly advanced our understanding about science and technology and successfully mediate between civil society and various structures of governance helping the elaboration of relevant democratic policies towards science and technologies and the adequate articulation of emerging social and economic problems. These are *ecological problems*, the old and new types of pollution (among them low intensity radiation, spread of genetically modified biological species, global warming, etc.); *problems of urban planning and transportation*; search and introduction of *new sources of energy*, etc. Contrary to this in transitional South-Eastern European countries the environmental degradation and poor planning increase the sensitivity of ecosystems, making them more vulnerable in case of natural hazards. In some countries, the political transition towards a democratic system went hand in hand with institutional and societal vulnerability. In all these issues, as well as in transformation of countries' research system and its opening towards the needs of new private industry and public sphere, the STS approach is especially relevant.

Due to the specific circumstances of the

region's recent history, STS studies there are still underdeveloped. In 1990s there were few research group or single scientists scattered over the region, which explicitly related their work with STS. It is only since of last decade when the researchers from Austria, Slovenia and Bulgaria have gradually begun to establish different forms of cooperation. During the last several years some researchers from Serbia and Montenegro, Croatia and FYR Macedonia are actively working on the field, seeking cooperation. Hence the objective of the project is to foster the exchange of the accumulated expertise in the field of Science and Technology Studies between the partner countries involved and to discuss the relevant theoretical approaches and research methods for interdisciplinary research. This objective also includes identification of the policy implications of STS approach and exchange of ideas for improving the relationships between emerging STS community in South-East Europe with civil society and the new structures of democratic governance.

To achieve these ends various activities are under way – regional research workshops, local policy events in partner countries (in the form of one-day seminar to meet local STS experts with policy makers, NGOs and media), establishing an interactive web-site for exchange of information among the partners and other relevant groups in the region and publication of volume with papers from the workshops and local events.

Regional Workshop on Science and Technology Studies In Southeastern Europe.

The 2005 workshop

A workshop took place in November 25-26, 2005 at Koprivki Resort near Plovdiv, Bulgaria. More than 20 researchers and graduate students participated in the workshop from all partner countries. The work was organized in four regular and one ad hoc sessions. The session on *Innovation Studies In South-East European Context* discussed the role of STS researcher as expert adviser in the shaping of national innovation strategy (Franc Mali, University of Ljubljana), Innovation Policy in Croatia (Jasminka Lažnjak, University in Zagreb), and the notions of national and regional innovation systems in the context of SEE transition (Kostadinka Simeonova, BAS Center for Science Studies and Mimi Vassileva at TSG-IS). In the second session on *STS perspectives on development* Dejan Pendev from Economic Institute in Skopje, Macedonia presented his critical evaluation of the strategic plans for local economical development in the Republic of

Macedonia, based on original understanding of entrepreneurial activities. The two other speakers in the session analyzed the global patterns of urban planning (Alexandra Stupar, Faculty of Architecture, University of Belgrade) and NGO experience in improving public participation in urban planning (Danijela Milovanovic, Faculty of Architecture, University of Belgrade). The final paper of the session discussed the new graduate program on Development Studies at the University of Ljubljana, Faculty of Social Sciences (Anton Kramberger).

The session on *STS as research challenge* discussed diverse aspects of studying research and engineering practice. They varied from methodological problems of interdisciplinary research (Günter Getzinger, IFZ, Graz), the issues of sustainability in transforming socio-technical systems (Harald Rohracher, IFZ, Graz) through the policy strategies and practices of the agents in dual-use technologies in Bulgaria (Todor Galev, TSG-IS, Sofia) and an interesting STS analysis of the Bulgarian floods in 2005 as simultaneously political, engineering and physical phenomenon (Tihomir Mitev, TSG-IS, Sofia).

In the last session on *STS in Biotechnologies and Medicine* Bernhard Wieser (IFZ, Graz) analysed the Ethical, Legal and Social Aspects of Genome Research based on evidence from his study of Austrian Genome Research Program. Adelina Ilieva (Bulgarian Center for Bioethics) presented the research and mediation program of this newly established NGO. The Workshop also hosted *ad hoc session*, where graduate students from Plovdiv University have presented selected papers their summer practices on *Sociology Of Large Technical Systems* and *Academic Spin-Of* (industry-university relationships).

The network

The network was initiated by researchers from the TSG-IS in Sofia and is coordinated by the head of the group Dr. Ivan Tchalakov.¹ However, this project became possible because of the long-term research and networking efforts of IFZ in Graz, Austria. Our Austrian colleagues have already accumulated rich experiences in studying users' involvement in innovation and participatory design, role of women in science and technology, environmental and ethical hazards of genetic technologies, etc. Apart from their research, since 1999 they are organizing the annual *International Summer Academy on Technology Studies* where eminent STS-researchers from all over the world gather for joint discussions. IFZ also runs an *International*

Fellowship Program on STS via its Institute of Advance Studies on Science, Technology and Society. Since the establishment of the program about 10 researchers from South-Eastern Europe have visited IFZ, working on different STS projects of mutual interest.² The annual Alumni Conferences of IFZ-IAS fellows, held in Graz, are also helping to keep the established contacts alive and provoke ideas for further cooperation, one of which is the present project proposal. More information on the STS-network and its partners can be found at the SEENet-STS Website (<http://www.seen-sts.net/>), designed by the Serbian partner at the Faculty of Architecture, Belgrade University – Alexandra Stupar and Daniela Milovanovich – and a book on “*Governing Sociotechnical Change in South-Eastern Europe. Contributions from a Science and Technology Studies Perspective*”, edited by Ivan Tchalakov, Franc Mali and Harald Rohracher. The book is due to be published by December 2006. Information about ordering can be requested from the editors (tchalakov@sociology.bas.bg, franc.mali@fdv.uni-lj.si, Rohracher@ifz.tugraz.at).

“*Governing Sociotechnical Change in South-Eastern Europe. Contributions from a Science and Technology Studies Perspective*”, East-West Publishers, Sofia, 2006

The book is the first attempt to present in common frame the development of Science and Technology Studies in the several countries in South-Eastern Europe (SEE) and Central Europe (Austria, Bulgaria, Macedonia, Serbia and Slovenia) – the emergence and developments of research institutions, their programmes (projects, publications), the human potential, teaching curricula in the field of STS, policy initiatives. The second part of the book comprises eleven papers written by researchers participating in the network. The papers discuss theoretical and policy aspects of the concepts of national and regional innovation systems (H.Rohracher, K.Simeonova, F.Mali, M.Vassileva) and provide some empirical validation of these concepts in studying transformation of research and technologies the region since 1980 till the beginning of this century. The papers of Philip Spaet offers an account the emergence of so-called ‘Energy Regions’ in Austria – their emergence, structures and patterns of development and relates his analysis with the notion of regional innovation systems. The paper of Todor Galev adds an interesting policy

perspective, analysing the transformation of legal framework of STS policy in Buglaria. The paper of Ivan Tchalakov offer an overview of the different models of post-socialist economic transition and their sensitivity to address the problem of technological transformation in the region. The papers of two Serbian participants in the book offer and STS perspective to the problems of urban development, discussing such key issues as public participation in urban planning (Daniela Milovanovich) and role of technology in shaping the city landscape and helping their inhabitants to search for a “new kind of defense and a new mode of existence - creating its own limits and passivity, closing themselves into the real and virtual capsules” (Alexandra Stupar). Biomedical trend in STS is presented by paper of Assya Pascalev on Bulgarian Center of Bioetics and its activities. The book ends with interesting paper of Tihomir Mitev, providing and actor-network analysis of the flooding in Bulgaria in the summer of 2005.

Notes

1 TSG was established in 1999 with the aim to develop the research tradition of former *Department of Sociology of Science and Technical Progress* (1967-1991). Preceding activities of the members of the group include and ethnographic study of holographic laboratory (CLOSPI) at BAS (1993-1997), industrial

comparative study of ICT in Bulgaria, Romania and Macedonia and their effect on local industries (project TACTICS, EU IV Framework Program), dual-use technology policy in Bulgaria in 1990s, etc. The group consists of three researchers - Dr. Ivan Tchalakov (head of the group), Dr. Vassil Kirov and Dr. Svetla Koleva and three PhD students, working on *Heterogeneous community in large technical systems: conditions for sustainability* (Tihomir Mitev), *Regional innovation system* (Mimi Vassileva), *Dual-use technologies in Bulgaria* (Todor Galev). The later has successfully defended his PhD in November 2005. Since 2001 in collaboration with Department of Sociology at Plovdiv University the group has launched a research program on the forms of engagement of human actors in laboratory science and large technical systems. The program is seeking for establishing the conditions thank make possible a deeper ‘moral’ commitment towards the studied objects and served technical systems as precondition for human agents’ responsible behavior in critical situations.

2 Three of the team-leaders in the project, including the project coordinator, have been IFZ-IAS fellows.

The authors express their thanks to Harald Rohracher

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Innovation Cultures

by Jiří Loudín

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A report of the international workshop „Innovation cultures – challenge and learning strategy“, Prague, 2nd-4th June 2005.

The organizers of the workshop were the Centre for STS Studies at Institute of Philosophy, Prague (Academy of Sciences of the Czech Republic), and the Centre for Social Innovation, Vienna. The encounter was co-funded by ASO (Austrian Science and Research Liaison Office) Brno and Austrian Cultural Forum Prague. 16

foreign and 6 Czech participants presented their statements in the workshop. The task of the workshop was to analyze the actual conceptual issues of the innovation field.

Innovation activities occur in the specific social and economic context including the cultural and political traditions of the respective national or otherwise defined community. The major role is played by the historically developed systems of education, culture, entrepreneurship, or governance, “life practices” at large. In this

context, the concept of “innovation culture” may be applied into the analysis. Innovation culture – as a distinct set of values and practices – is tightly embedded in a broader culture of the specific national, social, and cultural communities.

In all of Europe, the need is felt to make “European” innovation culture more dynamic (Europe is seen to be too rigid, inflexible, stagnant), link it more tightly to users and market, overcome the existing gap. Such efforts were politically conceptualized into the “Lisbon strategy”.

In the climate of overall pressure on application and commercial effects of research, the “Central-European” model of education, research and innovation is often criticised. The academic and exclusive nature of education and knowledge production as well as rigidity and inflexibility of entrepreneurial environment is considered to be the most relevant weakness. This criticism has manifold validity in the case of transitional Central and Eastern European Countries (CEEC) considering their recent history. Transitional countries still have a relatively low innovation performance, but this situation may also be interpreted as an opportunity for determining the appropriate innovation strategy for future.

The stimulating issues were addressed by the participants of the workshop in manifold ways. Thematically, the papers may be structured into several groups. There were papers focussing on the broad social context of innovations, hence targeting the issues of the very innovation culture (Josef Hochgerner, Karel Müller, Harald Rohrer, Klaus Schuch). One of the workshop’s priorities was the conceptual and methodological issues of innovation policy (Agnes Fesus, Adolf Filáček, Imre Hronszky, Michael Rogers, Howard Rush, Michael Schmidt, Paul Simmonds). The innovation policy theme was specified on the example of “countries” innovation reports (Miroslav Janeček, Gerd Schienstock, Peter Stanovnik, Štefan Zajac). To the core innovation agenda undoubtedly belong both the concepts of knowledge/technology transfer (Henry Etzkowitz, Balázs Lengyel, Anna Vitásková, Marzenna Weresa) and competitiveness/catching-up (Balázs Borsi, Anna Kadeřábková, Jiří Loudín).

In the discussion on a broader social/cultural framework of innovations, it appeared that the social and cultural resources of high innovation dynamics may be of very different natures. Excellent innovation performance may be stimulated by a pressure on overall flexibilization

and thus decreasing certainty, but it may be based also on the systems with strong social and cultural stability. Such stability may strengthen trust and encourage activities with a high risk potential. Nations, societies and cultures have differently developed relationships between dynamics and stability, flexibility and steadiness. For various modes of their configurations, the concept of “flexurity” has been coined recently. Flexibility of social/economic structure may go hand in hand with stability and firmness in system of standards and norms. The configurations of these factors are nation- and culture specific and their uniqueness belongs to the most relevant resources of development.

Culture is a realm of meanings, symbols, institutions. The speakers stressed the role of institutional change and institutional reflexivity in innovation field. For the production of novelty, it is decisive to be capable of adaptive learning and be able to combine both the national and international, traditional and new resources.

The problem of technology and knowledge transfer is for Europe of vital interest, not to say for CEEC. The presence of Henry Etzkowitz of course stimulated a discussion on the new events in the interface university-industry. Etzkowitz mentioned the fact that some leading universities (Stanford) developed such a strong position in the relationship toward industry that they assume the leading part in the interaction. Based on strong knowledge supply, they are able to set the rules and modes of intellectual property rights – e.g. whether to establish its own start-up firm or opt for licensing. A crucial role in transfer is played by the search mechanisms for new solutions and by the students who have at large a positive attitude to an application effort. The speakers also discussed the various concepts of knowledge transfer at regional, national and international level.

At present, the concepts of competitiveness and catching-up are quite frequently used; these are especially stimulating for Central Europe. Moving ahead means for Central European countries (as for the others) mainly to focus on knowledge and innovation (quality-based competitiveness). It is an even more difficult task in the period when the entire world “is under reconstruction”. What is recommended is to be able to adapt and master the universal competition/innovation concepts but at the same time to make them country/culture specific/sensitive. This was exemplified on the transformation/innovation story of the Czech Republic, Slovakia, and Slovenia as well on the case of one of the world’s competitive leaders

Finland.

For more detailed information on the workshop, see

http://www.flu.cas.cz/stss/vse2/en/inovativ_cultures.html. The book comprising the

papers presented on the workshop has appeared with the publishing house *Filosofia*, Prague.

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Research on Technological Innovation

by Dominique Vinck

Université Pierre-Mendès-France, Grenoble

A report of the Second study days of the “sciences, technological innovation and society” Research Committee 29 of the Association Internationale des Sociologues de Langue Française (AISLF), May 3-5, 2006, Grenoble (France).

The “Sciences, technological innovation and society” Research Committee started at the end of the 1990 and experienced a significant development since the Quebec congress in 2000. This development was stressed by the first study days in Dijon (2003), organized by Pascal Ragouet and the sociology department of Dijon University), then the specific sessions during the AISLF congress in Tours (France, 2004), after which the “Thematic Group” became a “Research Committee”, and finally the conference “Sociology of arts, sociology of sciences” in Toulouse (November 2004) (Co-organized with the AISLF CR18 “Sociology of Art” and the Research network “OPUS”). The second study days, organized in Grenoble by Dominique Vinck and the CRISTO (Research Center in Socio-Technic Innovation and Organisation (<http://web.upmf-grenoble.fr/cristo/>), thus came to install a regularity in meetings on this thematic.

As during the first study days, the call for communication was broadly opened, not privileging any approach or “school”, but encouraging contributions supported by empirical work and/or a good knowledge of the field. 52 communications were presented by 65 authors. The topics covered analyses of institutions (institution, profession and scientific

movement; scientific training), of laboratories (laboratory studies and scientific practices) and work on the techniques (techniques, social practices, body and use). Compared to the preceding meetings, one could observe a slight disciplinary centring (less participants not sociologists) and the renewal of work on laboratories and research practices. These works renew the approaches trying to integrate the results of traditional studies of laboratories on practices, instruments and statement construction and analyses taking more into account the organisational (financings, internal organisation and management), institutional (disciplines, specialities, professions, research system) and societal (relations to various external collective actors) dimensions. On their side, the works on scientific institutions encounter new questions echoing with recent social movements related to the French research system. The international dimension of the meeting made also possible to put in prospect some for these questions through international comparison (introductory conference of Yves Gingras on the universities). These study days gave place to proceedings edited by Dominique Vinck (under the title “*Sciences, Innovation technologique et société*”), which gathers summaries and texts of the communications of those authors who agreed to send in advance. The proceedings (in French) can be ordered through e-mail (Catherine.Urrea@upmf-grenoble.fr) for 35 euros. The group decided to pursue the same way into the further. At the end of the second study days, the organizers announced the next launch, (January 2007) of a new journal, the *Revue*

d'Anthropologie des Connaissances, an electronic journal mainly in French (Chief editor, Riga Arvanitis. E-mail: rigas@option-service.fr).

The first issue will be dedicated to "techniques, practices, body and use » and the second one to « laboratory studies ».

Conference Announcements and Calls for Papers

The 6th International Conference on the History of Chemistry, entitled *Neighbours and territories: The evolving identity of Chemistry*, in **Leuven, Belgium**, 28 August - 1 September 2007. See <http://www.6ICHC.be>. A major aim of the conferences organised by the WP is to facilitate communication between historically interested chemists and historians of chemistry from all over Europe. Previous conferences organised by the Working Party were held in Budapest in September 2003 (Communication in chemistry in Europe) and Lisbon in September 2005 (Chemistry, Technology and Society). Throughout its history, chemistry has been shifting ground between different territories. From its roots in artisan technology, pharmaceutical workshops and alchemical philosophy, it developed into the archetypical laboratory science of the eighteenth and nineteenth century, claiming full academic status. Chemists invaded many new fields, from agriculture and industry, to medicine, public hygiene and pharmacology. In the twentieth century, chemistry contributed to the major developments in molecular biology, quantum mechanics, environmental science and nanotechnology. But it also gained a key position in the oil industry, the fabrication of plastics and pharmaceutical research. This broad and continuous adaptation of the discipline to various fields of expertise, has brought chemistry in close contact with neighbouring disciplines and social pressures. Time and again, chemists have needed to carve out their territory, to negotiate with other specialists, and to claim particular expertise in widely diverging fields. The conference aims at a better understanding of the territories claimed by chemistry and its shifting boundaries with other disciplines. Scholars who want to present a 20 minutes paper at the conference are invited to submit a one-page abstract to the Programme Committee before 1 February 2007. To submit

your abstract, as well as for questions concerning the scientific programme, please contact José Ramón Bertomeu-Sánchez, the Chairman of the International Programme Committee, at Jose.R.Bertomeu@uv.es. The members of the International Programme Committee will referee all abstracts, and authors will be informed about acceptance or rejection before 15 April 2007.

The **Smithsonian Institution**, Washington, DC is holding a conference on Polar History, October 31-November 1, 2007. The program committee of *Making Science Global: Reconsidering the Social and Intellectual Implications of the International Polar and Geophysical Years* invites papers for a possible two-day conference at the Smithsonian Institution, examining the impetus for (and the impact upon) science, society, and culture of the International Polar Years (IPYs) of 1882-83 and 1932-33, and the International Geophysical Year of 1957-58, as well as how this perspective might be useful for planners of the current IPY in 2007-2008. We intend to explore the origins of these efforts, their political dimensions, and their consequences. Themes might include the place of the poles in human imagination, discipline formation, cultural nationalism, politics, and trans-nationality prior to and after 1882; the emergence of the modern geosciences in the first half of the twentieth century; the uses of new technologies to explore the poles; and changing assessments of the nature of human cultures in high latitudes. Papers addressing the International Geophysical Year might examine its role in the Cold War and the extent to which multi-disciplinarity and multi-national cooperation and competition shaped the geosciences and contributed to environmental awareness. Pending funding, the conference will be held in Washington, D.C., immediately prior

to the History of Science Society meeting in 2007. International scholars and graduate students seeking exposure to the history of the geosciences are particularly welcome. We hope that the papers will merit publication. Proposals for papers should include a title and abstract, as well as curriculum vita. Deadline: December 31, 2006. Please send these electronically to David DeVorkin devorkind@si.edu, Roger Launius launiusR@si.edu, and James Fleming jfleming@colby.edu.

19th Century Chemistry: Spaces and Collections is the title of the international conference, to be held on 1-4 February 2007 at the Museum of Science, **University of Lisbon**, Portugal. See <http://19chem2007.mc.ul.pt>. Registration deadline: 30 November 2006 Abstract submission deadline: 20 October 2006. Further information: 19chem2007@mc.ul.pt. The inauguration of the magnificent 19th century Laboratório Chimico of the University of Lisbon in 2006 provides an opportunity to explore and discuss challenges related to the role of scientific heritage in the history of science in general and the history of chemistry in particular. The event pertains to research, interpretation and promotion of 19th century chemical heritage (collections, archives and historic spaces), with particular emphasis on: bridging the gap between the history of ideas in chemistry and the material culture of chemistry; historians of chemistry and collection-based research; the material culture of chemistry and the training of historians and museum professionals; relations between chemical collections and archives; interpretation of historical spaces and collections; biographies of spaces and objects in the history of chemistry; chemical heritage and the public engagement with chemistry; political issues in the preservation and management of scientific heritage.

The Second Conference of the *British Society for Literature and Science* will be held at the Birmingham and Midlands Institute in central **Birmingham**, hosted by the University of Central England, from 29-31 March 2007. Plenary speakers include Sally Shuttleworth, Robert Crawford and Jenny Uglow. Papers may address topics in the interactions of literature and science in any period and any languages. Presenters need not be based in UK institutions. We also invite panel proposals for three papers of 20 minutes or four papers of 15 minutes;

members of the panel should be drawn from more than one institution. Please send an abstract of no more than 400 words and a 100-word biographical note (or in the case of a panel, abstracts and notes for each speaker) to bsls_at_englit.arts.gla.ac.uk, by 30 November 2006. Please send abstracts in the body of messages; do not use attachments. Alternatively, abstracts and proposals maybe posted to Dr Stuart Robertson, School of English, University of Central England, Perry Barr, Birmingham B42 2SU, UK. Please address any queries to Dr Stuart Robertson at the email or postal address above.

The Society for Risk Analysis Europe Meeting in 2007 will be held from 17 – 19 June, in **The Hague**, the Netherlands. The conference theme is *Building bridges: issues for future risk research*. The conference aims to facilitate interaction among all players in the risk field. The conference will take a comprehensive view of risk analysis. The progress made in two decades of SRA-Europe meetings will be evaluated and research focal points for the coming years will be identified. Contact the local organizers at sraeurope2007@gw.utwente.nl For more information, the Call for Papers and important dates, see www.sraeurope2007.eu.

Nordic Workshop on Health Management and Organization will be held in **Copenhagen**, 7-8 December, 2006. The Nordic healthcare sectors are currently experiencing a new wave of changes that challenge some of the basic boundaries within the healthcare field. Change initiatives are no longer just concerned with the modernization of existing entities and practices within the field but also with redefining and redrawing geographical, sectoral and professional boundaries. The heading "structural reform" captures only some of numerous initiatives in the field, namely attempts to effect large-scale change of healthcare practices through the redrawing of geographical boundaries and the redistribution of authority and responsibility among local, regional and national policy levels. Other movements originating in part within the healthcare sector itself also put professional, sectoral and organizational boundaries on the agenda, such as the movements of integrated care, clinical pathways, electronic patient records, etc. In addition there are now numerous attempts to redescribe the role of the patient in health care through "empowerment", free choice schemes, etc. The study of boundary definition

and its implications raises a number of particular analytical challenges since it involves analyses of processes of transformation and emergence in which new institutions, organizational forms and systems of coordination and exchange evolve. The purpose of the Nordic Workshop on Health Management and Organization is to address processes of boundary redefinition and to examine their implications for management and organization within the healthcare field in the Nordic countries. See <http://www.cbs.dk/chm>.

Risk and Rationalities, the conference organised by the ESRC Social Contexts and Responses to Risk Network, will be held at the Queen's College Cambridge, 29-31 March 2007. Details at:

<http://www.kent.ac.uk/scarr/events/rrcontext.htm>. Speakers include: Professor Pat O'Malley, Carleton University: Risk and the Rationalities of Security Dr Jocelyn Pixley, New South Wales: Emotions and Economic Choice Professor Andrew Oswald, University of Warwick: Economics and Wellbeing Professor Nick Pidgeon, University of Cardiff: Rationalities and Risk: Psychological Approaches. How people identify and manage risks and uncertainties are central concerns in the policy and social sciences. These issues are becoming more pressing as a result of social, economic and political changes and of developments in theory. Different approaches draw on different rationalities, stressing the importance of rational action, of culture, of emotions and affect, of everyday cognitive heuristics, of intuition and of the role of trust. Conference streams include: The dynamics of risk: change and development in risk rationales; Approaches to risk in different disciplines: rational actors, psychometrics and cultural values; Government and responses to risk; Varying rationalities in the management and regulation of risk; The advantages and limitations of heuristics; Affect and emotion in explaining risk responses; Trust and risk; Rationales of power, conduct and resistance; and General stream. Send abstracts (max. 150 words) by Friday 20th October 2006 to Ms Mary Mustafa Email: M.Mustafa@kent.ac.uk Tel: 44 1227/827102.

The 2nd Annual Symposium of the *Postgraduate Life Sciences and Society Network*, hosted by the Medical Museion, Faculty of Health Sciences, **University of Copenhagen**, will be held on 14-17 January 2007. The symposium, entitled

Contested Categories, will focus on how the recent biosciences challenge and reconfigure formerly stable categories: The social and the biological, the nature/culture dichotomy and the human/animal boundaries are increasingly blurred and become populated by hybrids, cyborgs and boundary objects. New material objects, visual and virtual representations produced and circulated in biomedicine and biotechnology challenge and disrupt the analytical categories of the historiographical and social studies of science. The new categories emerging in this empirical field of the biosciences raise a host of questions: What are the sites of contestation and which categories are at stake? What new kinds of contested/ambiguous relations become possible and acquire significance? How are they co-produced and mediated by material objects and visual and virtual representations? What are the theoretical and methodological implications and challenges we face when studying the life sciences? How can comparative and interdisciplinary studies contribute to exploring the formation and reconfiguration of categories such as race, gender, kinship, life, the body etc? In which ways can concepts such as biosociality, bioindividuality and hybridity address these changes - are they useful tools or phenomena of these transformations? The symposium will be held at the Medical Museion, Fredericiagade 18, 1310 Copenhagen K (<http://www.museion.ku.dk/>). Further information is available on the website of the Postgraduate Life Sciences and Society Network, <http://www.lse.ac.uk/collections/plssg/> and on the Medical Museion weblog (<http://www.corporeality.net/museion/>).

In connection with the project "For Whom the Bell Curves," the workshop, entitled *Statistics as a boundary object between science and the state* will be held in **Trondheim, Norway**, 14-16 May 2007. The workshop will be open to a limited number (max 100) of senior and junior academics. PhD students who participate and present a paper will also be able to receive course credit. Plenary speakers confirmed so far: Alain Desrosières, author of *The Politics of Large Numbers*; Simon Cole, University of California - Irvine; Karen-Sue Taussig, University of Minnesota; Jonathan Kahn, University of Minnesota; and Ann Rudinow Saetnan, Norwegian University of Science and Technology. The parallel paper sessions on themes such as: Statistics in municipal

governance; Population categories; Criminal justice statistics; Health statistics; and Mathematical practices. See <http://www.svt.ntnu.no/iss/projects/bell/>, or contact Ann Rudinow Sætnan, annrs@svt.ntnu.no, tel. +47 735 91786.

Life in Motion: Shifting Spaces, Transcending Times, Crossing Borders is the title of the 8th Postgraduate Conference, held by School of Social Studies, Masaryk University, **Brno, Czech Republic**, 28th - 30th June 2007.

Seventeen years after the onset of revolutionary changes in 1989, Central and Eastern European societies are still confronted with their histories. Memories and recollections of the past are contested and the past is painstakingly constituted through the interplay of collective construction, political bargains, reversals, rationalizing of refusals to come to terms with it as well as attempts to recognize the past and cope with it. Central and Eastern Europe (CEE) have witnessed unprecedented spatial and population shifts and splits which marked the 20th century globally. Many minorities which were often local majorities or equal in number were left in the aftermath of wars as mere memories that quickly faded due to the rapid intrusion of communism. The process of building societies which are not just ethno-culturally heterogeneous but also open to all diverse groups has been contingent on coming to terms with the past. This process became the arena for opening ways to facing current challenges such as migration, borders dissolution and violation of local social and economic balances. Since 1989 CEE societies have undergone unparalleled social change, however, the expected reforms in the spheres of law, public policy, culture, media, economy and social policies have been substantially delayed and compromised. The simultaneous emergence of free-market economies and pluralist politics led to situations in which the state quickly withdrew or collapsed, and distinctions between state, collective, and private domains became unclear. It has been in the interest of those actors that emerged in this initial phase of change to prolong a specifically post-socialist culture between socialism and the free market. This may have decisively contributed to the Eurosceptic backlash in the ranks of particular mainstream political forces and in specific cultural segments and sections of societies in some CEE countries. What is in this light the meaning of "the big European switch" of 2004 and its upcoming enlargement follow-

up? How 'Central and Eastern European' have the CEE countries stayed and Western Europe become? What are the reconstituted boundaries? The conference is organized in cooperation with the School of Slavonic and East European Studies, University College London, the conference presents a major opportunity for postgraduate students and young academics to discuss the events in Central and Eastern Europe also including but not limited to Russia, Eurasia, the Balkans, and the Baltic States. We invite submissions and participants from a wide range of disciplinary perspectives. Proposals should be sent, as email attachments, to: tomasekm@fss.muni.cz at the latest January 31, 2007. Further details: <http://www.h-net.msu.edu/announce/show.cgi?ID=152432>, or Marcel Tomasek, tomasekm@fss.muni.cz.

Science and Religion: Historical and Contemporary Perspectives, the international and interdisciplinary conference to mark the retirement of Professor John Hedley Brooke, will be held at the **University of Lancaster**, UK, 23-26 July 2007. The conference will bring together leading historians, philosophers, and theologians to debate the latest research into science-religion relationships. Further information: <http://www.lancs.ac.uk/depts/history/news/science&religion.htm>.

ECAP'07, the *European Computing and Philosophy Conference*, is to be held at the University of Twente, **Enschede**, The Netherlands, June 21-23, 2007. The Program Chair is Philip Brey, and the local organisation is run by Katinka Waelbers, k.waelbers@utwente.nl. More information: <http://www.utwente.nl/ecap07/>. Submission of extended abstracts: January 29, 2007. The conference will deal with all aspects of the "computational turn" that is occurring through the interaction of the disciplines of philosophy and computing. E-CAP conferences are organized under the supervision of the International Association for Computing and Philosophy (IACAP).

The Business of Race and Science is the title of the conference to be held on March 30-31, 2007 at the Center for the Study of Diversity in Science, Technology, and Medicine, Massachusetts Institute of Technology,

Cambridge, Massachusetts, USA. Recent advances in genetics have renewed interest in sciences and technologies of race. Although humans may share 99.9% of their genes, there may be much that is interesting, even profitable, in the remaining 0.1%. This has fueled rapidly growing interest in a range of products that claim to take advantage of differences between human populations. Companies now market race-specific medications and vitamins, and other racial therapeutics are in development. Competing laboratories offer genetic analyses of race and ancestry. Racial science has infiltrated our discussions of topics as wide-ranging as cosmetics and forensics, while parallel developments commercialize differences between strains of plants and animals. Increasing funding for racial analyses from governments, corporations, and consumers will only accelerate this process. Are these ventures appropriate uses of new understandings of race? Will this commodification of racial science help or harm the targeted populations and society at large? Who speaks for populations in endorsing or sanctioning the commercialization of racial difference? How will the controversies play out in different countries and contexts? How will attending to the business of racial science help understand the science itself and clarify its role in our world? Write to Gregory Dorr, Ph.D., Program in Science, Technology, and Society, Massachusetts Institute of Technology 77 Massachusetts Avenue E51-185, Cambridge, MA 02139, USA, gdorr@mit.edu, <http://web.mit.edu/csd/BRS/Welcome.html>.

Scientific research in World War II is the title of the two-day conference to be held on 25-26 January 2007 at the Museum Boerhaave, **Leiden, the Netherlands**. The event will seek to explore how scientists managed to cope with the particular circumstances created by the war. We invite historians working on World War II, science, and scientific instruments to give their views and to elaborate on the theme. For a further description: www.museumboerhaave.nl/conference. Sessions: 1. Warfaring countries. Papers in this session will deal with the circumstances under which scientists worked in War waging countries such as Germany, Japan, Great Britain, the Soviet Union, and the United States, and the results of their research. Topics to be discussed are e.g. the service of scientists in weapon programs and strategic industries, or the immigration or emigration of many researchers. 2. Occupied

countries. Papers in this session will deal with the circumstances under which scientists worked in occupied countries, such as The Netherlands and France, and the results of their research. Talks could focus on topics such as the way scientists coped with scarcity of resources, the limited means of communication, or the often remarkable continuity in research conducted under apparently difficult circumstances.

The **University College Dublin** Humanities Institute of Ireland in association with the Royal Irish Academy Committee for the History of Irish Science will hold the conference, *Communities of knowledge in nineteenth-century Ireland: science, culture and society*, on 22-23 February 2007. The primary objective of this conference is to elucidate aspects of the intellectual richness of scientific and antiquarian activity in Ireland during the course of the nineteenth century. It is not intended to focus on the history of Irish science per se. Rather, it will seek to cast light on the complex and varied interactions between scholars of science, antiquarians and science policy-makers in Victorian Ireland. It is intended to explore the seamless web of research and knowledge which constituted academic enquiry at this period. Particular attention will be paid to the educational, social and cultural implications or impact of such research. In this regard, contributions to the conference will be presented from a standpoint of intellectual inclusivity. It is intended that such a premise will inform a series of papers which will discuss aspects of intellectual and institutional interaction between scholars, scientists and policy makers. Accordingly, the conference will seek to eschew the distinctive disciplinary boundaries which determine and to some extent regulate contemporary research in the humanities and in the sciences. This conference will be hosted by UCD Humanities Institute of Ireland in association with the Royal Irish Academy Committee for the History of Irish Science and will take place over the afternoon of Thursday 22 and morning of Friday 23 February 2007. The conference will consist of a series of thematic sessions (with time for discussion after each session). It is intended that there will be a complimentary exhibition of UCD's archival holdings in the history of Irish science and science policy. Speakers will include - Michael Ryan (Chester Beatty Library), Prof. Mary Daly (UCD), Marc Caball (HII), Juliana Adelman (NUIG), Ruth Bayles (QUB), Michael John

Gorman, (Forfás), Greta Jones (UU), Patrick Wyse Jackson (TCD), Jim White (UCD), Catherine Cox (UCD), Ron Cox (TCD), Julia Sigwart (UCD), Jim Bennett (Director, Museum of the History of Science, Oxford), Clara Cullen (UCD). Organising committee: - Marc Caball, Clara Cullen and Mary Daly. Venue: - UCD Humanities Institute of Ireland, University College Dublin, Belfield, Dublin 4. Ph. 01-7164690. Email hii@ucd.ie, <http://www.ucd.ie/hii>.

The *Third International Congress of Qualitative Inquiry* will take place at the **University of Illinois**, Urbana-Champaign, from May 2-5, 2007. See <http://www.qi2007.org>. The theme of the Congress, building on Jan Morse, is "Qualitative Inquiry and the Politics of Evidence." Participants will explore the politics of evidence and truth and what these terms mean for qualitative inquiry in this new century. If we as qualitative researchers do not define these terms for ourselves, someone else will. Questions to be considered include: In qualitative inquiry, What is truth? What is evidence? How is evidence evaluated? Can evidence be manipulated? How can qualitative research inform the policy-making process? How is qualitative evidence represented, discounted, or judged to be unacceptable? What is a fact? What is true, or false, or evidence is determined by socially defined criteria. Different discourses-- law, medicine, history, cultural, or performance studies -- define qualitative evidence differently. The Congress will consider the influence of scientifically based research (SBR) models on qualitative inquiry. These models are becoming quite influential in other nations (U.K., South Africa, Australia). The Congress will also consider what evidence and truth mean under the terms of postpositivism, poststructuralism, indigenous, democratic, postcolonial, queer, feminist, performative, and participatory models of inquiry. Participants will explore new ways of evaluating and using qualitative evidence in social policy arenas. They will examine how new understandings of qualitative evidence can advance the goals of social justice and progressive politics. Session Themes will include, but not be confined to, rethinking such terms and topics as: mix-methods, voice, authenticity, lived experience, the politics of evidence, evidence-based research, research design, data, empirical material, epistemology, triangulation, validity, reliability, coding, sampling, induction, deduction, naturalism,

generalizability, science, analysis, interpretation, rules of inference, models of quality, case-based, collaborative, mixed and multi-method approaches, narrative and performative criteria of evaluation, criteriology, pragmatism, interpretive rigor, constructivist criteria, action-based criteria, transformative-emancipatory criteria, warrantability, writing as interpretation, trustworthiness, collaborative action research, auto- and performance ethnography, arts-based inquiry, coloring epistemology, colonial and post-colonial epistemologies, critical performance narratives, critical pedagogy, democratic methodologies, discourse, ethnodrama, epistemology, social justice criteria, the ethics of evidence, ethics and IRBs, womanist inquiry, critical focus groups, funding qualitative health care research, new rules of evidence for grounded theory, advocacy as method, qualitative evaluation inquiry, new technologies of evidence and inference. We invite your submission of paper, poster and session proposals. Submissions will be accepted online only from October 1 until December 1 2006. Conference and workshop registration will begin December 1, 2006. To learn more about the Third International Congress and how to participate, please email info@qi2007.org.

Varieties of Cultural History: Theory and Practice in the Cultural Histories of Medicine, Science, Literature and the Arts is the title of the conference to be held at the **University of Aberdeen**, 5-8 July 2007. Keynote speakers will include Peter Burke (Cambridge), Peter Mandler (Cambridge), Crosbie Smith (Kent), Rebecca Spang (Indiana) and Evelyn Welch (Queen Mary, London). In the last twenty-five years, diverse anthropological, literary, and other perspectives adopted into Cultural History have transformed the theory and practice of historical disciplines more generally. As Cultural History comes of age, this conference provides the opportunity to reflect upon the particular achievements of the 'Cultural Turn' at work in histories of medicine, science, literature and the arts; to foster creative dialogue amongst advocates of such varieties of cultural history; and thus to look to possible futures of research in Cultural History. The conference seeks papers approaching any historical period, domain, or theme; but the organizers particularly favour papers which explore specified genres of Cultural History as applied in case studies from the subjects highlighted above. Please send title, abstract of no more than 300 words, and biographical note

of no more than 100 words, to Dr David Smith (d.f.smith@abdn.ac.uk) by 7 December 2006. Electronic submissions are encouraged; you may also write direct to the organizers at the Department of History, School of Divinity, History and Philosophy, Crombie Annexe, Meston Walk, Aberdeen AB24 3FX, United Kingdom. Additional queries may be directed to David Smith at the addresses above. See also www.abdn.ac.uk/ch and www.abdn.ac.uk/history.

ISHPSSB, the Biennial Meeting of the *International Society for the History, Philosophy and Social Sciences of Biology*, will be held in **Exeter, UK**, 252-9 July 2007. Since its inception, the International Society for the History, Philosophy, and Social Studies of Biology (ISHPSSB) has brought together scholars from diverse disciplinary backgrounds to discuss historical, conceptual, epistemological, political, institutional, and ethical issues of the life sciences in an open and informal setting. Over the past twenty-odd years, attendance has increased from about 60 participants to about 350 in Guelph, 2005. In 2007, we hope to continue our tradition of an inclusive and experimental approach, while meeting the challenge of increased attendance. Scholars wishing to attend the meeting are now invited to submit session and paper proposals on the ISHPSSB website (visit <http://www.ishpssb.org/meeting.html>). Deadline for submissions is February 15, 2007, and abstracts should not exceed 500 words. Please also note the guidelines for paper acceptance that have been adopted by the Society. To facilitate communication in advance of submission, the ISHPSSB website also offers the possibility to post ideas for sessions and discussion panels electronically (<http://www.ishpssb.org/phorum/list.php?9>). If you are interested in putting together a session or discussion panel by posting a call for contributions electronically, we urge you to specify a deadline for responses to you personally. While individual paper submissions are welcome, we strongly encourage submission of session and panel discussion proposals. The Society is open to proposals on any topic connected with the history, philosophy and social studies of the life sciences. For the 2007 meeting, we would especially welcome sessions in the following areas: Interdisciplinarity. Recent years have seen the foundation of interdisciplinary centres for the study of the life sciences and their social, legal, and ethical implications in a number

of national contexts. At the same time there is a trend towards disciplinary segregation that has also been felt during the ISHPSSB meetings in recent years. What explains these trends of disciplinary specialization? Are historians, philosophers, and social scientists heading in similar directions, or are they heading far afield from one another? Is the pressure on biology studies to become 'policy relevant' acting against or actually encouraging specialization? Why do history, philosophy, and sociology of science tend to drift apart, while disciplines become less and less important in the life sciences themselves? Anthropology of the Life Sciences. Recent years have seen a number of attempts to employ the empirical methods and the conceptual tools of social anthropology in the study of the life sciences, especially with respect to the effects of new reproductive technologies on conceptions of kinship and identity. Is there such a thing as an 'anthropological approach' to the life sciences, and if so, what could it look like? And is this indeed the field, as some of its protagonists claim, where historical, sociological, and philosophical studies of the life sciences could join hands to adequately reflect the complex, hybrid formations in which biological knowledge is produced today? Biology and Politics. From William Harvey's theory of blood circulation to Rudolf Virchow's cell theory, from Darwin's theory of evolution to present day conceptions of the genome as 'our common inheritance' -- biological themes have always resonated with political ones. What is the impact that novel biological theories and practices have had on conceptions of human identity and agency, especially in the contested areas of sex/gender and race/ethnicity? And how do political agendas and contexts shape research in the life sciences? Systems Biology. Recent years have seen an upsurge of systemic approaches in biology that try to make sense of the vast amounts of data that have been accumulated by the genome sequencing projects and other data-gathering exercises. Systemic approaches have a long history in biology. But do their recent counterparts actually signal a return to a more holistic biology, or are we in fact witnessing the complete takeover of mechanism and reductionism in biology? And does systems biology raise new ethical, legal, and social challenges? Biology beyond the Evolutionary Synthesis. A lot of scholarly attention, especially in the philosophy of biology, has been invested into the interpretation and evaluation of evolutionary theory. Large areas in the biomedical sciences, however, are concerned

with data collection or the elucidation of mechanisms and functions, activities that seem to gain little, if anything, from evolutionary speculations. Moreover, it becomes increasingly evident that the large majority of organisms, especially microorganisms, do not fit the standard model of speciation. How would a broader perspective on the life sciences affect our understanding of life? If you have any ideas, questions, or suggestions, please contact the program officers. Email contact is strongly preferred, but if you do not have access to it, you may also send letters via regular mail. If you write by e-mail, please make sure to include the term ISHPSSB in your subject line. Staffan Müller-Wille, S.E.W.Mueller-Wille@exeter.ac.uk, and Hans-Jörg Rheinberger, rheinbg@mpiwg-berlin.mpg.de.

Environment Health & History, the Conference of the European Association for the History of Medicine and Health will be held on 12-15th September 2007 at the Brunei Gallery, **Bloomsbury, London**. Keynotes by Chris Hamlin, Notre Dame University, Indiana; Dieter Schott, Darmstadt University of Technology, Germany; and Chris Sellers, State University of New York at Stony Brook. Increasingly historians of medicine and of science have begun to seek common ground with environmental historians and with geographers studying the material, cultural and social relations embedded in place. A lively dialogue between different methodologies and approaches is under way. This conference seeks papers on a wide range of topics across all time periods and disciplines, with national, cross national and international dimensions. It is hoped through such exchange to discuss and develop ways of approaching the interface between environment and health in ways which are sensitive to the past but also speak to present day concerns. Title and abstract to be received by the end of November 2006. Further details: <http://www.lshtm.ac.uk/history/EAHMcaIlfpapers.html>. Contact details for further information: Ingrid James, Centre for History in Public Health, LSHTM, Keppel St. London, WC1E 7HT, Email: Ingrid.james@lshtm.ac.uk or telephone +44 207 927 2434. Conference hosted by the Centre for History in Public Health, LSHTM and sponsored by the Wellcome Trust, EAHMH, SSHM and LSHTM.

Extending The Boundaries: New Research in

Sociology is the title of the Postgraduate Conference to be held on Friday 27th April 2007 at the School of Social Sciences, City University, Whiskin Street, **London EC1V 0HB**. In the contemporary world 'boundaries' have become an increasingly important and often contested issue. Migration and new media technologies challenge notions of territorially bounded social and cultural identities. New working practices such as working from home are increasingly blurring the boundaries between the 'public' location of the office and the 'private' location of the home. Additionally within sociology, social theorists such as Giddens are increasingly transcending disciplinary boundaries. But where, why and how are boundaries still enforced and maintained? And what is the resulting impact on the quality of our social existence and/or sociology as an academic discipline? The aim of the conference is to explore the concept of 'boundaries' in different substantive sociological areas, but also in terms of interdisciplinary and methodological divisions in order to create opportunities for developing new and diverse perspectives on dealing with issues relating to the concept of 'boundaries' in different contexts. Research students at any stage in their doctoral research are invited to submit papers exploring the issue of 'boundaries'. Papers can be methodological, theoretical and /or substantive and submissions from all sociology related disciplines are welcomed. The conference provides an opportunity for research students to present and discuss their work in a friendly and supportive environment and registration is free to all research students. Please submit abstracts of a maximum of 300 words to E.Karamanidou@city.ac.uk by Friday 8th December 2006. For further information about the conference, please visit the conference website at <http://www.city.ac.uk/sociology/mediacomm/Boundaries.html>.

Standardization, Prototypes and Quality: A Means of Balkan Country Collaboration is the conference to be held May 18-19, 2007, **Thessaloniki, Greece**. This Conference will be an excellent opportunity to continue contacts between scientists and specialists from all Balkan countries, in order to exchange their experience and knowledge relevant to the abilities of standardization, prototypes as well as quality. International practice has proved standardization to be an ideal way to coordination and harmonization on production and distribution of

goods and to the economy as a whole. Therefore, the purpose of this conference is to facilitate the promotion of collaboration between Balkan countries through standardization and to strengthen their economy. Participants, who wish to present a paper relative to the above topics, should send an abstract (200-300 words) to the conference secretariat until December 10, 2006 by e-mail (Word, Arial 10, full aligned). The submitted abstract should include the name(s) of the author (s), as well as his/her (their) affiliation (including e-mail address, postal address, telephone number, fax number etc). After the notification of acceptance authors are requested to send also full scale paper (up to 10 pages, Arial 10, full aligned, margins 30mm, single line spacing) until March 2, 2007. Abstracts will be published in a volume and full scale papers will be included in the Conference Proceedings after reviewing. Conference Secretariat, Mrs Katerina Christodouloupoulou, 19 Epimenidou str. Thessaloniki GR 54633 Greece, tel +30 2310 286680, +30 2310 286182; fax +30 2310 286680, protypation@auth.gr, www.eneprot.gr.

The 6th Biennial International *Triple Helix Conference on University-Industry-Government Links* will be held in **Singapore** from 16-18 May 2007 with the theme "Emerging Models for the Entrepreneurial University: Regional Diversities or Global Convergence". The conference will be organized by National University of Singapore (NUS) Enterprise in Singapore. Past Triple-Helix conferences have been held in Amsterdam, New York, Rio de Janeiro, Copenhagen/Lund, and Turin (http://www.triplehelix5.com/triple_helix.htm). Organized for the first time in Asia, Triple Helix VI 2007 will provide a global forum for academic scholars from different disciplinary perspectives as well as policy makers, university administrators and private sector leaders from different countries to exchange and share new learning about the diverse emerging models of the entrepreneurial university, the changing dynamics of University-Industry-Government interactions around the world and the complex roles of the university in local, regional and national economic development. We invite scholarly paper contributions that seek to advance our understanding of the dynamics of University-Industry-Government interactions in general and the emerging entrepreneurial university models in particular. We also welcome practitioner-oriented contributions that provide insights on new policy innovations and

share knowledge on practices, as well as proposals for workshops and poster presentations that contribute to promoting exchange and dialogues on how universities in the 21st century can better cope with the challenges of globalizations while serving local and regional goals. Authors are invited to submit papers on one or more of the following sub-themes: 1. Role of Triple Helix Linkages in National Innovation System; 2. Indicators/Measurement of Triple Helix Linkages and Dynamics; 3. Models of Entrepreneurial University; 4. University Technology Commercialization & Spin-offs; 5. Technology commercialization from Public Research Organizations; 6. Economic Impacts of Universities and Public Research Institutions; 7. Triple Helix Linkages & Dynamics in Emerging Economies; 8. Managing Triple Helix Relationships and Networks; 9. Policies for Promoting Triple Helix Linkages; 10. Organizational and Management Challenges in Triple Helix Nexus; and 11. Triple Helix Linkages in the context of Globalization. Queries related to abstract/paper submissions and the conference theme can be directed to the organizing chair (papertriplehelix6@nus.edu.sg). Deadline for abstract submissions 8 January 2007.

The "*Futures of Life*" Workshop, organized by the graduate students and faculty of the Department of Science and Technology Studies at **Cornell University**, will be held on April 27-29, 2007 in Ithaca, New York, USA. The new life sciences pose many challenges for contemporary societies, not least the difficulties of acquiring and creating knowledge about potential social and technological "futures." Knowledge claims about the future have peculiar epistemic properties, stemming from multiple layers of uncertainty, ignorance, and reflexivity. Such claims, which are often aimed at intervening in the future not just representing it, blend the descriptive and the performative. Their forward-looking focus leaves them positioned in a speculative space informed by a precarious mixture of fact, conjecture, and fantasy. The speed of change in the biosciences, combined with the complexity of the social and natural worlds in which they are entangled, makes the process of creating knowledge about putative "biofutures" particularly difficult. Anticipatory knowledge is often considered less than reliable, and yet it is highly coveted and vitally important -- its tools of prediction and control are essential to the activities of states, firms and civil society.

This workshop will focus on the social dimensions of anticipatory knowledge. The majority of the papers will focus on the new life sciences, but other areas of sociotechnical change will be included for comparative purposes. In particular, we are interested in the creation of anticipatory knowledge; the institutional capacities and social machinery used to create it; its spread, uptake, translation, and use; and its role in reshaping regimes of governance.

Potential questions for investigation include: How do producers of anticipatory knowledge negotiate tensions between the precision of a prediction and the likelihood it will turn out to be correct? In what ways do particular anticipatory techniques shape what becomes visible and invisible? What normative choices are embedded in different machineries of anticipation? How is the credibility of claims about the future of life assessed in different contexts? How is anticipatory expertise claimed and contested in different social worlds? How do desires, ideals, and utopian and dystopian visions inflect anticipatory knowledge? In light of secrecy and proprietary concerns, who gets access to what anticipatory knowledge, under what terms and conditions, and with what consequences? How does anticipatory knowledge articulate with various regulatory frames in diverse cultural and political contexts? How do decision makers manage disconnects between the available anticipatory knowledge and that which a policy regime requires? How is anticipatory knowledge implicated in identity politics and emerging social movements? If you are interested in participating, please submit 500 word abstracts by December 1st, 2006 to Nicole Nelson, ncn6@cornell.edu.

Utopias, Human Rights, and Gender in Twentieth Century Europe is the title of the workshop sponsored by the Institute for Contemporary History, University of Vienna in association with the Freud Museum (Vienna) and Cooper Union (New York). Conveners: Prof. Dr. Atina Grossmann (Cooper Union, New York) and Prof. Dr. Carola Sachse (University of Vienna). It will take place at the **Freud Museum, Vienna**, December 13-16, 2007. The deadline for proposals (1 page and brief CV) is January 31, 2007. Twentieth century European history has been marked by catastrophic violence and persecution unleashed by movements and regimes promising to create racial, political, and social-economic utopias. It has also brought an unprecedented recognition and articulation of

concepts of human rights, formulated in individual or collective (national, ethnic, or cultural) terms. Both utopian visions and conceptions of human rights have been inflected by, and shaped, definitions of gender. The workshop will focus on the tensions and contradictions between models for social utopias and concepts of individual human rights, between visions of utopia and gender equality, and between individual and collective rights and obligations. We welcome contributions dealing with the most prominent social movements, political regimes, and economic models in twentieth century Europe. These in part overlapping, in part competing, and in part uncompromisingly opposed movements, regimes, and models include Fascism, National Socialism, Communism, liberalism, Zionism, Americanism Social Democracy, and laissez faire capitalism. We want to ask very broadly and in reference to each case: How were notions of the self and individual self-determination linked to models of social organization? What roles were assigned to men and women; to what degree were these roles hierarchical or egalitarian? How were ideas and ideals of collective and individuals rights reconciled and negotiated? To what degree were they conceived in terms of gender equality or difference? How were these ideas and ideals institutionalized and anchored in norms, laws, and discourses? How did "biopower" (to use Foucault's term) register in the political, social, and cultural history of utopian movements and regimes? How did the discourses and practices of "social rationalization" -- explicit and pervasive across the political spectrum in the first half of the twentieth century -- continue to work after the Second World War? How were they interrupted or recoded? What influence can be ascribed to alternative discourses, particularly psychoanalysis, in conceptualizing and mediating the relationship of individual and collective, as well as of women and men, in these utopian regimes and visions? Moreover, what sort of utopian notions are embedded in psychoanalysis? How did individual women and men reflect on their personal engagement in utopian social movements and political regimes in memoirs, correspondence, diaries, and other literary or visual documents? What is the place of gender as an analytic category in the historiography of modern utopias as well as in the formulation and institutionalization of human rights? We invite proposals from historians and scholars in a variety of related disciplines, including the social sciences and cultural and legal studies. Proposals

related to ongoing graduate or post-doctoral projects are particularly welcome. Please submit a one page proposal and brief CV in either English or German to: irene.maria.leitner@univie.ac.at by January 31, 2007. We will notify the 12-15 selected participants in February 2007. Papers of no more than 15 pages must be submitted, in either English or German, by October 31, 2007. The workshop in December 2007 will focus on

discussion of pre-circulated papers and prepared comments by the participants. A follow-up conference is planned for Fall 2008, for discussion of revised papers to be included in a German-language volume to be published in 2009. Contact: Prof. Atina Grossmann, Faculty of Humanities and Social Sciences, Cooper Union, 51 Astor Place, New York, NY 10003-7120, ag93@nyu.edu.

Opportunities Available

There is a vacancy for a Ph.D. Project at the Department of Philosophy & Science Studies, Institute for Science, Innovation & Society (ISIS), Faculty of Science, **Radboud University Nijmegen**, the Netherlands. The project is entitled, The role and representation of scientific expertise in policy development and public debate: a biographical approach. The Project Manager & Supervisor is Prof. Dr. Hub Zwart. We live in a knowledge society in which expert knowledge is both indispensable and contested. Professional practices and policy development are expected to be science-based but at the same time we recognize that the complexity of our world is beyond the grasp of any single form of expertise. Against this backdrop we are interested in the ways in which science-based expert knowledge is used and represented in our society. This involves a set of important questions. Are experts merely specialists, for example, generating data to be used by professional policy makers, or do they have the right or even obligation to enter broader disputes on the relationships between science and society? To what extent are experts seen as credible, trustworthy and independent? Is it possible to develop a typology of forms of expertise, each with its own objectives and standards? Various pitfalls as well as best practices will be distinguished. We will opt for an interactive, biographical approach. We want to study on a case-by-case basis the recruitment of experts and the genesis of their societal visibility. Eventually, the status of science & society research itself will be at stake. On the one hand we want to describe and analyze the ways in which expert knowledge is used and represented, but eventually it is our intention to develop a critical assessment. More information: Prof. Dr. H.A.E. Zwart, h.zwart@science.ru.nl, tel +31.24.3652038,

www.filosofie.science.ru.nl. The deadline is 6 November 2006. Applications: letter of interest and CV, can be sent to: Human Resources (P&O), Faculty of Science, Radboud University Nijmegen. PO Box 9010, 6500 GL Nijmegen, the Netherlands.

The Department of Classics at **Brown University** has been authorized to announce an open-rank search for a historian of the exact sciences in antiquity. We seek candidates with a primary focus on one, and ideally on at least two, ancient civilization(s) and who possess scholarly and teaching interests in multiple aspects of those civilizations, such as (but not limited to) ancient astronomy, the physical and mathematical sciences, and the transmission of scientific texts. We anticipate that the successful candidate will establish connections with others at Brown interested in the history of science and in the ancient world. Though the Department of Classics is conducting this search, a focus on Greco-Roman antiquity is not a requirement, and a successful candidate who works primarily in another field or fields will be appointed to the Department most closely aligned with his/her interests. Prerequisites for consideration include evidence of scholarly distinction and excellence in teaching, commensurate with rank. Junior candidates must have the Ph.D. in hand by July 1, 2007 and should submit a letter of application, a curriculum vitae, three letters of recommendation, and a sample of scholarly writing. Candidates above the junior level should submit a letter of application and a curriculum vitae, including the names and contact information of at least four references. Applications should be sent, preferably by November 10, 2006, to: Chair of Exact Sciences

Search Committee, Department of Classics, Brown University, Providence, RI 02912, USA.

Review of applications will begin immediately and continue until the position is filled or closed.

Preliminary interviews will be held, when feasible, at the American Philological Association annual meeting in San Diego (January 5-8, 2007) and/or the American Philosophical Association meeting in Washington, D.C. (December 27-30, 2006).

Inquiries may be directed to Mary_Louise_Gill@brown.edu. Brown University is committed to diversity in its faculty and encourages applications from qualified women and under-represented minority candidates.

The Institute for Advanced Studies on Science, Technology and Society, **Graz, Austria** has announced its Fellowship Programme 2007-2008. The IAS-STs in Graz, Austria, promotes the interdisciplinary investigation of the links and interactions between science, technology and society as well as technology assessment and research into the development and implementation of socially and environmentally sound technologies. The IAS-STs invites researchers to apply for a stay between 1 October 2007 and 30 June 2008 as Research Fellow (up to nine months) or as Visiting Scholar (shorter period, e.g. a month). The IAS-STs offers excellent research infrastructure. Close co-operation with researchers at the IFZ (Inter-University Research Centre for Technology, Work and Culture; see: www.ifz.tugraz.at), guest lectures, workshops and conferences provide an atmosphere of creativity and scholarly discussion. Furthermore we can offer five grants (up to EUR 1,000 per month) for long-term Research Fellows (up to nine months) at the IAS-STs. The Fellowship Programme 2007-2008 is dedicated to projects investigating the following issues: 1. Gender - Technology - Environment. Women with their various interests, competencies and potentials play an important part in the process of shaping socially sound and environmentally friendly sustainable technologies - as users and consumers or experts. Applications should focus on research in the field of women in traditionally male fields of engineering, on ways of creating cultures of success for women engineers (students, graduates), and on masculinity and the culture of engineering. 2. New Genetics and Modern Biotechnology. A main focus of the Fellowship Programme lies on research providing a critical

analysis either of human genetic research or of modern biotechnology. Researchers investigating either ethical, legal and social aspects of genetic testing or risk policy and wider governance issues related to agricultural biotechnology are especially encouraged to apply. 3. Technology Studies and Sustainability. Fellowships will be awarded for research projects contributing to the issue of sustainable development from the perspective of social studies or the history and philosophy of science and technology. Projects should aim at socio-economic aspects of environmental technologies or at strategies of environmental technology policy, such as user participation, strategic niche management or ecological product policy. We encourage both theoretical analysis as well as empirical case studies and implementation research. 4.

Information and Communication Technologies. A focus of the fellowship programme will be put on novel developments based on information and communication technologies (ICT) from an STS point-of-view. Topics like embedded systems, ubiquitous computing or ICT applications in traffic systems shall be analysed with respect to their wider social and political implications. Further issues of interest are the social shaping of new ICT developments and participative approaches to the design of ICT systems and applications. Applications must be submitted to the IAS-STs by 31 December 2006. For application forms and further information, visit www.sts.tugraz.at, or write Institute for Advanced Studies on Science, Technology and Society (IAS-STs), Attn. Guenter Getzinger, Kopernikusgasse 9, 8010 Graz - Austria, E-mail: info@sts.tugraz.at.

The **Max Planck Institute for the History of Science, Berlin** (Department II; Director: Prof. Lorraine Daston) seeks an outstanding junior scholar (Ph.D. no earlier than 2001, postdoc desirable but not necessary) for a three-year position (Research fellowship) to begin 1 August 2007 in conjunction with the research project "History of Scientific Observation" (for more details concerning the project and the Institute, see here). Applications (which may be submitted in French, German, or English) from qualified candidates of all nationalities and disciplinary backgrounds are welcome; the colloquium language is English. It is expected that candidates will be able to present their own work and discuss that of others fluently in that language. Research projects may focus on either the natural or human sciences. The position is

primarily devoted to research, with no teaching duties. It is ranked at the BAT IIA level (TVÖD E13) in the German system, which roughly corresponds to that of Lecturer in Britain, Assistant Professor in North America, and Maître de conférences in France. Salary is set by both the position's rank and individual factors; please address specific questions to Ms. Claudia Paass (paass@mpiwg-berlin.mpg.de). Applications consisting of a curriculum vitae (including list of publications), a research project (maximum 1000 words), and two letters of recommendation should be sent by 15 December 2006 to Max-Planck-Institut für Wissenschaftsgeschichte, Abt. Personal/WiMi Obs, Boltzmannstraße 22, 14195 Berlin, Germany. For questions concerning the research project and Department II, please contact Prof. Lorraine Daston (ldaston@mpiwg-berlin.mpg.de) or Dr. Fernando Vidal (vidal@mpiwg-berlin.mpg.de); for administrative questions concerning the position and the Institute, please contact Mr. Jochen Schneider (jsr@mpiwg-berlin.mpg.de). Applications from women are especially welcomed. The Max Planck Society is committed to employing more handicapped individuals and especially encourages them to apply.

The Max Planck Institute for the History of Science in Berlin announces five postdoctoral fellowships for up to two years, beginning in fall 2007. 1. One fellowship, beginning 1 October 2007, in Department III (headed by Hans-Jörg Rheinberger). Projects related to the history and epistemology of the life sciences are particularly welcome. 2. Four fellowships, beginning 1 September 2007, in Department II (headed by Lorraine Daston). Projects should relate to the history and/or philosophy of scientific observation, in either the natural or human sciences. Outstanding junior scholars (Ph.D. awarded no earlier than 2002) are invited to apply. Fellowships are endowed with a monthly stipend between 1.900 and 2300 € (fellows from abroad). Women are especially encouraged to apply. The Max Planck Society is committed to employing more handicapped individuals. Qualified candidates with relevant projects may submit applications to both departments. The fellowships are open to candidates of all nationalities. The colloquium language is English. Applications may be submitted in French, German, or English. Candidates are requested to send a curriculum vitae,

publication list, research prospectus (maximum 1000 words), a sample text, and two letters of recommendation no later than December 1, 2006 to Max Planck Institute for the History of Science, Administration, PD-II-III, Boltzmannstraße 22, D-14195 Berlin, Germany.

The Department of Nuclear and Particle Physics and the Department of History and Philosophy of Science at the **University of Geneva**, Switzerland, are opening a PhD student position related to a European project in the field of the history of Astroparticle physics. The candidate is expected to collect and analyse data and documents pertaining to a study of the emergence of Astroparticle physics as a discipline in European countries and worldwide. He (she) shall also participate in a study aiming at assessing how Astroparticle physics is presently reviewed and funded by the Swiss National Science Foundation and other agencies, and how one could improve the coordination of reviewing and funding of large European Astroparticle physics infrastructures. During his (her) research, he (she) will explore the archives of various European agencies and research institutes, participate to meetings, and interview key scientific and administrative actors. Funding period: Depending on the scientific training and curriculum of the candidate, this is a one or two years position with a planned extension for two more years. All travel expenses and other costs related to the project will be covered. Requirements: The successful candidate shall have a fairly good knowledge of particle physics, astrophysics, and cosmology and some acquaintance with the methods and issues of history and sociology of science. Good English speaking and writing skills are mandatory. Applications, including a detailed C.V. and a list of publications, should be sent to: Prof. Maurice Bourquin, Département de Physique Nucléaire et Corpusculaire, Université de Genève, 24 quai Ernest Ansermet, CH-1211 Genève 4, Switzerland. Deadline: 31 October 2006.

The Wellcome Centre for the History of Medicine at **UCL, London**, seeks applications for a three-year research fellowship on any field of the history of Central Asia and medicine. PhD or an equivalent research degree, and an active programme of research in Kazak and Uzbek, are required. Remuneration will be in the range from the low to mid-30,000 pounds sterling, depending on seniority. The fellowship may be

taken up as early as January 2007. UCL will be offering language studies in Kazak and Uzbek, and hopes that it might be possible to raise funds for a longer term academic post. A letter of application, curriculum vita, and the names of three referees are due by post or email to Prof. Cook by 17 November 2006. For further information, please see www.ucl.ac.uk/histmed or contact the Director, Harold J. Cook, at h.cook@ucl.ac.uk or 210 Euston Rd., London NW1 2BE, UK.

Post-doctoral research fellows are invited to apply for participation in an interdisciplinary project at **Cornell University** on Contentious Politics: Science, Social Science, and Social Protest (http://www.socialsciences.cornell.edu/theme_projects.html). Applications will be accepted for one or two-year positions, beginning approximately August 15, 2007. The project is led by an interdisciplinary team that is exploring the political construction and social diffusion of authoritative knowledge derived from either the natural or social sciences, ranging from transgenic organisms in agriculture to models of economic development. The team is interested in the diffusion of social movements that construct, promote or contest public policies grounded in such knowledge, especially where such movements explicitly challenge the credibility of knowledge claims or the authority of the institutions that produce them. The project, coordinated by the Institute for the Social Sciences, will sponsor a seminar series, visiting scholars, and opportunities for multi-disciplinary research collaboration. Fellows will have access to the full range of university resources and receive an annual stipend of \$50,000 plus health benefits. Applicants must have a Ph.D. by August 15, 2007; scholars who have completed their Ph.D.'s within the past five years will be considered. Screening of applications will begin November 15, 2006. Applicants should submit a curriculum vita, a brief statement of research

interests, a writing sample, and three reference letters by e-mail to socialsciences@cornell.edu. Cornell is an affirmative action/equal opportunity employer; minorities and women are encouraged to apply.

The BIOS Centre for the Study of Bioscience, Biomedicine, Biotechnology and Society, **London School of Economics** and Political Science seeks a Research Fellow in the BIONET Programme, Salary: £35,662 p.a., Fixed Term to 30 September 2009. BIONET is a 'Coordination Action' funded under the Sixth Framework Programme to research the ethical governance of biological and biomedical research in China and to run workshops and conferences. It includes 21 partners, including 6 Chinese institutions, and nine European countries. BIOS at LSE is the lead partner. You will undertake research, data analysis, writing and publication within the framework of BIONET, assist with project organization and management, and develop and undertake individual research relevant to the aims and objectives of BIONET. You should have a good first degree, a doctorate in a relevant field in the social sciences, and experience in undertaking and managing research projects, report writing and publication. An interest in the ethics of biomedical research and clinical practice is essential, as is an interest in China, although previous knowledge or experience of research in China is not essential. Chinese language skills are not essential. You will work in one of the UKs leading interdisciplinary research centres for the study of the life sciences and society, in one of the world's finest social science institutions, and will be expected to participate fully in the life of the Centre and of the School. We value diversity and wish to promote equality at all levels. Please visit <http://www.lse.ac.uk/jobsatLSE> for a full application pack. If you cannot download the pack, email HR.Recruit.Res@lse.ac.uk or call 020 7955 6737 quoting reference 07/06/RES.

News from the Field

The Bulgarian Journal of Science and Education Policy (BJSEP) has been launched. A half of

year before launching the journal, the BulgJESP E-Mail List at Yahoo was established. The aim

of the List is to provide a forum for discussing of ideas, results and events in the field of Education/Science Policy, Management and Planning. The List seeks to link participants with shared interests in those areas. BulgJSEP has a two-fold purpose: (1) to foster communication and debate among the international community of professionals and scholars interested in the contemporary general problems of science and education, and (2) to serve as a clearinghouse for information relevant to the varied professional interests of this community, including research methods, scholarly conferences, and publications.

<http://groups.yahoo.com/group/BulgJSEP>.

Surveillance and Society, Issue 5 (2/3): Smart Borders and Mobilities: Spaces, Zones, Enclosures, edited by Louise Amoore, Stephen Marmura, and Mark Salter has issued a call for papers with the deadline for submissions set at 1 March 2007. The border has been called the fundamental political institution, delineating between inside/outside, us/them, safe/dangerous, known/unknown. With the increased ability of state and commercial agents to overcome and reinvent traditional sovereign lines, borders are instantiated throughout society not simply at border posts but also at airports, in databases, through international call centers, and with identity documents. Cross-border data-flows may complicate realities already identified as problematic within information-based societies. Surveillance practices in public spaces, border zones, and the workplace may become both more nuanced and more intrusive, as we see with anti-globalization protests, Schengen border zones, and in low-wage non-unionized labour shops. The tracking and identification of specific individuals or groups by government agencies may be intensified. Consumers may be increasingly subjected to 'foreign' marketing and advertising strategies not legally sanctioned within their own societies. Citizens may have data transmitted and analyzed far from the point of origin or of collection in the cases of passenger profiling or the more general war on

terror. Wider and wider risk groups are being surveilled in ways that circumvent or restructure borders. Surveillance and Society is seeking papers that examine how borders produce or reinforce spaces, zones, or enclosures and the processes, structures, and institutions of control that exceed the border. The editors are interested in how the mobility of data itself is transforming, what kinds of boundaries and exceptions this produces, how this rearticulates relationships between science, law and the political, and how the border is realized via data. We are seeking both theoretical and empirical articles which illuminate this set of issues. In addition to sociology, the subject of borders and surveillance holds relevance for a wide range of academic disciplines including geography, law, cultural anthropology, philosophy, and political science. We encourage contributions which draw attention to geo-demographic, legal, cultural, ethical, technological, political and/or social-economic aspects of data-flows. Possible topics of interest include: Implications for privacy in cross-border data-flows; Effect of RFID or biometric technologies on both identity documents and border policing; Dataveillance of financial transactions by both commercial enterprises and governments; Strategies of risk displacement and risk management through knowledge-industries; International surveillance of marginal or "dangerous" populations; International comparative studies of state approaches to the governance of cross-border data; Comparisons between corporate vs. state influence over data-flows; Divergences in relevant public attitudes towards privacy and personal data flows in different countries; and Parallels and anomalies concerning data-flows and international flows of goods, currency and persons. Submissions should be sent electronically to Emily Smith at smithea@post.queensu.ca. We welcome full academic papers, opinion pieces, review pieces, poetry, artistic, and audio-visual submissions. Please see www.surveillance-and-society.org for further submission guidelines.

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