Editorial

This double sized issue contains three articles which were presented at the recent EASST Conference in Lisbon, plus a number of reports and Rob Hagendijk's Presidential Address. The three articles form a remarkably coherent set on 'science in the periphery', related to the Iberian peninsula, the venue of the Conference. While the authors explore this issue from historical and sociological points of view, Minister José Mariano Gago, discussed the same isssue from a science policy angle. We are happy to communicate his speech to the readers of the EASST Review through the report which Leen Dresen made.

In addition, this issue offers the usual mix of articles, reports and news about the profession.

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Frontpage illustration: A guinea pig with Emil von Behring (and Wernicke and Frosch), Germany, 1891.

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EASST Review

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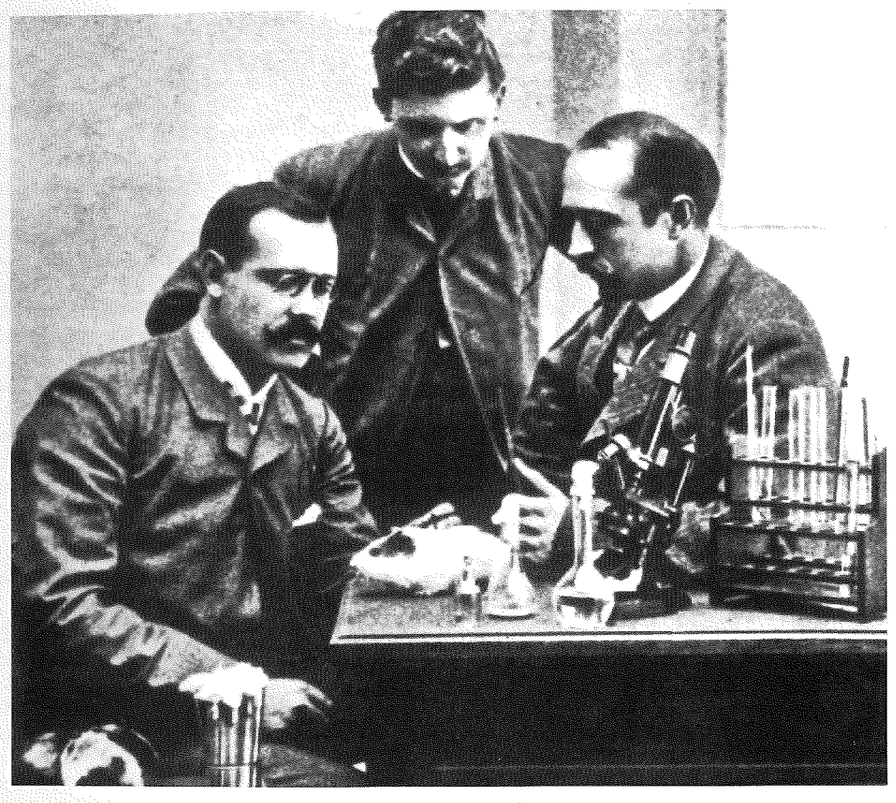

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Georg Kamphausen, 1982.

In the Times of the Abandoned Farmhouse

by Henrique Luiz Cukierman
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Introduction
In 1899, Paraguay and Portugal suffered an epidemic outbreak of bubonic plague, constituting a serious threat to Brazil, due to the intensely exploited commercial shipping routes proceeding from those countries. In October of that year, the plague finally reached the Brazilian port of Santos, forcing Brazilian sanitary authorities to immediately begin planning the construction of facilities for producing antiserum to combat the plague because of the difficulties in obtaining it from abroad. In Rio de Janeiro, an old farm, called Manguinhos, was chosen as the site. Strategically located at a safe distance from the bustle of the city, it became, after some work renovating and adapting its small abandoned farmhouse, the *Instituto Soroterápico Federal* [1], embryo of the future and majestic laboratory of Manguinhos, until today a Brazilian reference for scientific and technological research in public health.

At the beginning of the 20th century, many elements of the Anglo Saxon work ethic needed for scientific experimentation, including rigorous discipline, perseverance, and self-denial – deeply contrasted with the adventurous mentality that governed Brazilian social and cultural life, forged by the practice of obtaining fast results without sacrifices. So, to guarantee the recognition of the principal scientific centers of the 'civilized' world of a 'lost' laboratory below the equator, Brazilian scientists had to overcome strong cultural differences existing between Iberian values and the Anglo-Saxon world where science flourished. The immediate goal of establishing their facilities as an authorized representative of international science required competence in the rigorous pasteurian methods which was the first step towards the more ambitious objective of surpassing the barrier of mere intermediation to become also a productive center of scientific truths. This required a practical repertoire of modes and abilities based on severity and precision, nonexistent qualities in the Brazilian way of life, which was based on the accentuation of the affective, of the irrational, and of the passional, all emblematic attributes of Portuguese colonization. As an operative discourse emerged from the interior of the laboratory, based on situations where action proliferated and perspiration was a distinctive sign of nobility, more than a new science and a new scientists' community was being created but indeed a new society.

Our investigation consists of examining the everyday life in that abandoned farmhouse improvised as a laboratory for the production of bubonic plague antiserum, using scenes of scientists' daily work as a valuable instrument to surprise them in action. Our objective is to explore the cultural frontiers between the Iberian and Anglo-Saxon worlds, delineated by the adoption of Pasteurian scientific methodology into Brazilian society, inspired by the extraordinary analysis of Sérgio Buarque de Holanda, published in his seminal book about Brazilian cultural formation, *Raízes do Brasil* [2], from 1936 [HOLANDA,1987].

Scene 1
In 1900, having just arrived after a three year stay at the *Institut Pasteur*, Oswaldo Cruz was nominated the head of the *Instituto Soroterápico Federal*, and would have a meteoric career, becoming, in 1903, the most important sanitary authority in Brazil as head of the Brazilian Public Health Office. With his authority and credentials established, Oswaldo Cruz was able to translate interests dealing with the combat of bubonic plague, smallpox and yellow fever, into much larger ones such as the increase of international prestige for the country and the redemption of public health services in Rio de Janeiro [LATOUR,1987:117], building an heroic

reputation turned later into a national myth of dedication to the foundation and development of science in Brazil. The following scene is from the very origins of the *Instituto Soroterápico Federal*, extracted from a dialogue between Oswaldo Cruz and Ezequiel Dias, a medical student, narrated by the latter, after Oswaldo had extended him an offer to become a member of the minute scientific staff hired for the production of antiserum which they would soon begin to fabricate.

- Are you ready to work as many hours a day as necessary to fulfill your obligations without any fixed schedule?
- Yes, Sir.
- Now, a last question to which I attribute great importance: Do you know anything about bacteriology?
The young student had a moment of doubt: on one side, the fascination for an unexpected position of aiding a true scientist, besides the salary he would earn; on the other side, his conscience that compelled him to tell the truth. He opted for this choice though inwardly he fell into a crisis of moral dejectedness.
- No, Sir.
- Oh, excellent, this is one of the main requirements for the job, replied Cruz"
[DIAS,1922:110].

When questioning his disposition for working hard, Oswaldo Cruz was challenging the young student to overcome, through effort and perseverance, common characteristics of the Anglo-Saxon work ethic, old bureaucratic postures established since colonial times, and especially reinforced by the State apparatus brought by D. João VI, in his escape to Brazil, with the entire Portuguese court at the beginning of the 19th century. Cruz wasn't looking for a public employee worried only in maintaining his position in the State bureaucracy but, to the contrary, he needed a disciplined and dedicated worker. Discipline and dedication were qualities that clearly contrasted with the adventurous mentality that reigned over the Portuguese Empire, forged on the obtainment of fast results without great sacrifice. A 'true' scientist had to carry within himself the notion of fulfilling his obligations without regard for the time, without lassitude, without tepidness, and without indifference, a word to which Sérgio Buarque de Holanda dedicates special attention in *Raízes do Brasil*, clearly pointing to the difficulties which were to be confronted:

No rigor, no method, no foresight, always this significant abandonment that expresses the word 'indifference' - a word that writer Aubrey Bell considered so typically Portuguese as 'longing' and that, in his understanding, implies less a lack of energy than an intimate conviction that 'it is not worth the effort ...'
[HOLANDA,1987:76].

Yes, it was worth the effort to take advantage of the chance for practicing science in Brazil but in order to do so new attitudes were indispensable, beginning with an utilitarian regulation of time, more committed to production and results. The world of science began to emerge, though as a world apart, as an island of new values where new precepts had to be established in opposition to the vices of lassitude belonging to a society just freed from slavery. This world apart was confirmed by Oswaldo Cruz with his preference for candidates absolutely ignorant of bacteriology. Knowing would be knowing in the old way, the breaking with the past being the basic condition for penetrating microbial mysteries. To be admitted to that laboratory, it was a necessary condition to be void of experience, without any antecedents, or any vestiges of the old knowledge. Within this overriding desire for discarding the past resided the essence of local representation of 'modern civilized centers' while, evidencing that the emergence of Brazilian science demanded necessarily a new Brazilian society.

Scene 2
What were the initiating mysteries of bacteriology kept in that small temple of science? What was hidden in Manguinhos that no old knowledge would be capable of revealing? Without pretending to exhaust the subject we would suggest that, that new science required a practical repertoire of gestures and abilities based on rigor, precision and on a nonexistent discipline in Brazilian life which was distinguished by the accentuation of the affective, the irrational, the passional, and of "an affected and sugary softness" [HOLANDA,1987:31]. These attributes of Brazilian society, a part of the colonial inheritance, were characterized by Sérgio Buarque de Holanda when describing a phenomenon that can be easily related to this affected softness:

The diminutive ending 'inho' is used to make us more intimate with people or objects and, at the same time, to give them importance. It is the way to make them more accessible to the senses and also of approximating them to the heart [HOLANDA,1987:108].

With the adoption of this linguistic and cultural approach, it's easy to understand why the *Instituto Soroterápico Federal* has been referred to, since its very foundation, by the denomination of *Instituto de Manguinhos*. With the very act of naming, the world of affected and sugary softness would resist the rigor and coldness of scientific rationality. The description of those beginnings, narrated by Henrique Vasconcellos, another of the pioneers, shows quite clearly the clash between laxity and the unsugary rudeness of the obsession for accuracy:

Oswaldo, having decided to dose the vaccine through weighing and as the Institute didn't possess a precision balance, brought one of his own, with long arms and sensitive to 0.1 mg that oscillated... infinitely before stopping. It was really martyrdom to weigh with such a balance, principally because Oswaldo demanded double weighing.
When Oswaldo spoke of weighing, Fontes and Ezequiel became stupefied and apprehensive until the victim had been chosen, who then proceeded heroically to martyrdom without the slightest recrimination. With effect, during one hour, at minimum, one of them would sit there before the balance, which oscillated eternally... The weighing was only accepted after having been verified by Oswaldo when it was something of greater responsibility. At this time, the great master was of an immeasurable exigency
[VASCONCELLOS, 1922:181-182].

If great time was necessary, though it be an eternity, there was no backing away from precision. If the method demanded sacrifice, or a victim, one proceeded stoically along the via Cruces. If the weight had to be exact it didn't matter that the scales oscillated infinitely, only that the weighing was repeated. The only measurement which was allowed to be unadjusted was the exigency for exact measurements. Immensurability was part of the plan to convert the new pupils, to whom no truce would be given until they had proven their pertinence to that world set apart. He not only incarnated the role of exigent 'master', but fundamentally, Oswaldo Cruz carried out the crucial mission of faithfully representing 'modern civilized centers' inside the laboratory, zealously caring for all the procedures so that the results of such intense and dedicated labor could be sanctioned by foreign scientific centers. In this way, his laboratory could be approved as an authorized representative of 'international' science. For such, the first proviso would be to prove competence in laboratory procedures in order to one day dream of going beyond the barrier of mere intermediation to become a center of scientific truths. It was still a question of being aligned with the humble vassals of European science to firstly demonstrate that in Brazil all necessary precautions were integrally carried out, without which it would not be possible to affirm the facts of science. After all, how many ingenuous and illuded Latinos had been scorned for not following the catechism of procedural techniques? Among various precedents, one of the most celebrated was that of Domingos Freire, a Brazilian doctor, who in 1885 announced to the world *cryptococcus xantogenicus* as being the etiological agent of yellow fever, against which he even produced a vaccine, administered to 3,000 people, compiling statistical results that supposedly proved its effectiveness. Domingos Freire sought to be faithful to Koch's and Pasteur's lessons and for this same reason called the international community's attention. His work was analyzed by the British bacteriologists Sutton and Harrison, by the French Le Dantec of the Pasteur Institute and by the American George Sternberg, all of whom were unanimous in refuting Domingos Freire's results specifically for disobedience to the precepts of bacteriology techniques [BENCHIMOL,1995]. Oswaldo Cruz wanted to avoid the re-edition of the rejection of Domingos Freire's work, and so totally dedicated himself to conquer the complete dominion of the savoir-faire needed to manage a scientific laboratory.

Scene 3
The next scene, narrated by Henrique Vasconcellos, describes the manipulation of a guinea pig by himself and Oswaldo Cruz.

I won't defraud myself of the wish to refer here to what happened on occasion of the first inoculation of a guinea pig. (...) On that occasion, Oswaldo Cruz had only 3 auxiliaries – myself, already a doctor, and two medical students, Antonio Fontes and Ezequiel Dias, we being entirely ignorant of bacteriology. Oswaldo made it a point that his staff should have this good quality, as he said, because in this way he would educate us and would prepare us to his volition and in his own manner.

The crystallizer readied, the animal was placed in its interior and taken to the room where the inoculation would be administered.

I picked up the apparatus with which to hold the guinea pig and took it with me.

Upon seeing me Oswaldo asked me:

- What is that for?

- To hold down the guinea pig, I answered.

- But it's not necessary, the guinea pig will be held by hand.

- By hand? By whom? I asked.

- By you.

- By me?

- Yes, but in case you don't want to I'll hold it and you inject the serum, he retorted, fixing his gaze upon me.

- Show me how to hold the animal and I'll be ready, I told him, although I felt, I confess, a certain dread....

Really, Oswaldo showed me how to hold the animal: I did as he had taught and he picked up the syringe, already full of the culture, and injected it. We were both affected, me principally; our breathing was short and hurried. After having released the animal inside the crystallizer, I breathed deeply; I had just finished taking a great burden off myself. I looked at Oswaldo, who was laughing, though his face was covered with perspiration as was mine ... when he asked me if the fear had passed ...

On many, many occasions, while conversing about the primordials of the Institute, recollecting the past, we would always refer to this incident without forgetting any of the sensations or details, which would make us laugh congenially"
[VASCONCELLOS,1922:178-179].

From the very beginning of the scene, the recurrent theme of ignorance appears as an element of extreme importance for the initiation of the neophytes, but the great star of the dialogue are the hands of the researcher. The daily chores required an excellence of manual craftsmanship, the dominance of which formed an important part of the gestures indispensable to the practice of bacteriology. In that world apart, the flowers of erudite discourses typical to the professors of the Rio de Janeiro Medical School wilted, and in their place flowered operative discourse where actions proliferated and where sweat upon the face was a distinctive sign of nobility. Values of disciplined effort were accentuated as the way to unveil Nature's mysteries, which appeared within that scene as a moving exaltation to manual labor. Local science was building a new culture, unethical compared to the cultural roots of the old Portuguese metropolis, as observed, once again, by the subtlety of Sérgio Buarque de Holanda: "Action upon things, upon the material universe, implies submission to an external object, acceptance of a law alien to the individual. God does not demand it, it does not increase His glory nor does it increase our own dignity. To the contrary, you could say that it is prejudicial and demeaning to our dignity. Manual and mechanic labor seek an objective exterior to man intent upon perfecting something other than himself. It is therefore comprehensible that the modern religion of work and the appreciation of utilitarian activity has never been naturalized among Hispanic people. A worthy idleness always seemed more excellent, and even more ennobling to a good Portuguese or Spaniard, than the insane fight for the bread of each day" [HOLANDA, 1987:10].[3] Now it's possible to understand that the country that had begun to believe in microbes had to have a clean slate within the laboratory, creating there an experimental world of new social relationships and of a new way of valorizing work, as indicated from reading a magazine of that time: "Today, the battle in name of the great truths is waged not from the heights of cathedras but on the vast fields of experimentation. It's work..." [A Lanterna, 15/11/1903].

The times of the abandoned farmhouse, as briefly described here as a story composed of scenes and narratives, tries to help make more or less plausible relationships and distinctions [LAW, 1998]. For example, rendering less plausible the distinctions explicitly established by the scientists-narrators between the rigors of scientific objectivity and the passions of human subjectivity with its retinue of fears, shortcomings, desires, self-denial, idolatries and heroics. Or, to the contrary, rendering more plausible the relationships between culture and science when, inspired by Sérgio Buarque de Holanda, we examine old colonial habits grating upon the edges of Anglo-Saxon culture within the laboratory. A story about who or what should be included and in what way [LAW, 1998]. Especially because it includes the materiality of science, to the extent that it's a narration of science in action, observed through the daily activity of constructing and consolidating a laboratory. A materiality performed in a universe of artifacts - syringes, scales, instruments, etc. – in the quotidian, but to the same degree a corporal materiality performed by the hands of those same scientists. Dark tropical hands, hands that wanted to translate the construction of laboratory walls into the building of a new society, a modern society because founded on science but also because it would be based on the separation of science and society: a sophisticated and complex construction made of materiality and immateriality, a construction of bricks and spaces.

The times of the abandoned farmhouse is also useful for glimpsing a more subtle story, one about an attempt to overcome distinctions between 'center' and 'periphery' in a redefined planet that included Brazil as a place of science and included the practitioners of that science among those who were considered 'civilized people'. Therefore, stories of incidents and narratives that dared to include the tropics on the political map of the planet and show that 'civilization' existed below the equator.[4] Stories about a local dialect that sought to be included within the 'international' language of a new colonizer, modern science.

NOTES

1. National Serum Therapy Institute.

2. Roots of Brazil.

3. Nancy Stepan mentions a book by Louis Agassiz [AGASSIZ, Louis, AGASSIZ, Elizabeth C., 1868, A Journey to Brazil, Boston, Ticknor and Fields], the celebrated North American geologist, on occasion of his visit to Brazil, in the late 19th century, which also illustrates the difficulties encountered by Brazilian scientists when faced with manual labor: *"(...) Agassiz found the Brazilian scientists lacking in an interest in experimental science and their institutions inadequately supplied with materials for undertaking modern science. 'Surrounded as they are with a nature rich beyond compare,' he wrote, nonetheless, 'their naturalists are theoretical rather than practical.' He attributed the absence of experimental science in part to the institution of slavery, which he believed led to disdain for the manual labor that was essential for science. 'As long,' he wrote, 'as students of nature think it unbecoming a gentleman to handle his own specimens, to carry his own geological hammer, to make his own preparations, he wil remain a dilettante in investigation. He may be very familiar with recorded facts, but he will make no original researches'"* [STEPAN,1976:30-31].

4. The 'nonexistence of civilization' in the tropics is commented upon by Sérgio Buarque de Holanda when he notes, referring to the libertarian sexual habits of the Brazilian population during the initial centuries of colonization, that "(...) it was current in Europe, during the XVIIth century, the belief that below the equator sin was nonexistent: Ultra aequinoxialem non peccari. Barlaeus, who mentions this dictum, comments upon it, saying: 'As if the line that divides the world in two hemispheres also separated virtue from vice'" [HOLANDA,1987:198].

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(continued from p. 12)

NOTES

1. Cf. João Manuel Pacheco de Figueiredo, *Escola Médico Cirúrgica de Goa -- Esboço Histórico*, Bastorá, Tipografia Rangel 1960, p. 7.

2. Ibidem.

3. Arquivo historico Lultramarino (Lisboa), Estado da India Portuguesa, Relatorio do Serviço de Saúde, Referido ao anno de 1902 (my emphasis).

4. Ibid (my emphasis).

5. Roberto Frias, *Medicina Racional*, Nova Goa, 1885, p.44.

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Germ Theory in a Colonial Setting:
Medical Theories and Military Practices in Nineteenth Century Goa

by Cristiana Bastos
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This paper is a brief presentation of an on-going research about the establishment of bacteriology as the central paradigm in the medicine of infectious diseases. Our subject corresponds to a paradigm shift in the sense given by Thomas Kuhn: the transition from miasma to germ theory, in the late 19th century and early 20th century. That moment of the history of science is widely documented in narratives about Pasteur, Koch, the discovery of microbes, the evidence of contamination, or the procedures for sterilization. However, I believe that we are missing a quite important side of the story. The transition from miasma to germ theory was a radical change in the history of understanding disease, treating and preventing it, and that shift marked a new era in medicine. How did that shift actually happen, what was it actually like to live through that transition when dealing with disease, contagion, infection, transmission, treatment and prevention?

To answer those questions we should move beyond the traditional ways of accounting for the history of science - either the 'heroic' narrative based on naming names, discoveries, and accomplishments, or the pure 'social history' approach, based on context discussion. Instead, we suggest an 'ethnographic' type of approach to the issue.

Like ethnographers, we may change our focus from the notorious events and famous people, and study the trivialities and daily life in a specific setting. Such type of research corresponds to an effort of making sense of routine and normalcy, rather than the extraordinary. In other words, ethnographic work is about capturing the 'imponderabilia of daily life,' paying attention to its less glamorous aspects, using ordinary people as the source of information, scanning through the sources for some meaningful detail, waiting for the insight that will transform the observations into a model, allowing time to work its way to the intimacy of the subject.

We also suggest to move beyond the world of sterilization and contamination that characterized the accounts of early bacteriology in 19th century Europe, and focus, instead, on the non-sterile world of tropical bugs and plagues of that time. We believe that those plagues and the medical involvement with them reached the highest expression in the tropical sites that were then under European colonization. We believe that a more intimate, ethnographic-like approach to the practices of those who were actually involved with such plagues may shed light on the culture of infectious diseases as it exists up until today. For reasons we will point out later, we set our ethnography in Goa, a Portuguese-colonized enclave in India.

We should note that one of the most important fields of application and development for germ theory was the understanding of the tropical diseases that afflicted those living in European colonies or other tropical areas. The amount of illnesses experienced in the tropics provided a vast field for the exercise of discovery, naming, microscopic observation, testing and theory production. By the early twentieth century, under the influence of germ theory, tropical medicine was a flourishing field that on some occasions was the same as the civilizing process. In Brazil, for instance, the first bacteriologists are seen as national heroes who had an inspiring and civilizing action combating the pestilences of the countryside and the inner city: Oswaldo Cruz, Carlos Chagas, Adolpho Lutz. They fought for sanitation, they worked for the eradication of plagues, they discovered and named bugs, described their action, their vectors and reservoirs; they used the microscope and they distributed lymph and vaccines. They showed that the illnesses were not a fatality of geography, but the effects of infectious agents, whose cycles and modes of action could be subject to counter action. Up until today those early scientists are recalled and honored across Brazilian society. One of the most important

biomedical research centers is named after Oswaldo Cruz, and there is a history department documenting the development of bacteriology and sanitation, intertwined with political history. We suggest to add something to that analysis by choosing an empirical case in a militarized colonial domain like that of Goa.

Goa was a small Portuguese colony in western India enclaved within the wider British domains. Together with Damão and Dio, further North, Goa corresponded to the administrative unit of *Estado da India* - a highlight of the Portuguese colonial system until quite late in its history. The territories of the *Estado da India* had remained from a previously wider colonial occupation, one that had yielded to British administration. Most local bureaucracy and health administration were centered in Nova Goa, or Pangim, capital of Goa.

A few reasons favor our choice of Goa as a site to study the transition from miasma to germ theory. Colonial Goa had plenty of epidemic and endemic diseases, as well as responses to them. There is a rich collection of writings by the local medical officers of that time, both in manuscript and print form. Of those, we have already analyzed the collection of manuscripts of the India Health Services, part of the Arquivo Histórico Ultramarino (Overseas Historical Archives), in Lisbon, plus a variety of published works about health questions in Portuguese India. Goa provides a continuation of the cases already studied for British India, and yet was subject to different administrative and colonial styles. And Goa was the place of the first Colonial Medical School, a fact that provides not only links to a number of related research questions but also abundant documentation for our research subject.

Studying Goa's sanitary situation throughout those documents is comparable to an ethnographic approach to the subject. We can examine the paradigm transition towards bacteriology as it was experienced on the ground, and implied in medical practices particularly close to the actual diseases and illnesses, whose understanding was most affected by the new medical model.

The authors whose writings we examine were members of Goa's colonial society. They were either Luso-Indian doctors or Portuguese medical officers serving in India. They were composite characters: simultaneously physicians, bureaucrats, militaries, politicians, professors, researchers. They dealt with the problems of health in the tropics while dealing with the problems of a colonial society that juxtaposed cultures, social strata, religions, beliefs, modes of knowledge. They were practitioners of science and looked up and close to the latest developments in scientific research. They tried to implement every new achievement in knowledge while trying to understand the society they lived in, also their own. They expressed all these combined strains in the documents they produced, enabling us to follow their thinking and action.

Our authors were not mainstream scientists, or even credited as scientists in encyclopedias or in the history of science. They were truly peripheral to the process of science making. There was no Pasteur, no Koch, no Manson, and no Carlos Chagas or Oswaldo Cruz. They were not responsible for main discoveries, their names were not Latinized for newly described bugs, parasites or infectious cycles. There are no contemporary research institutes lending their names to posterity. They did not author text books read abroad. Their merits lie elsewhere - precisely in the fact that they were so common, so un-extraordinary. Just ordinary and average , they were equivalent to the man-in-the-street for sociological research, or the assorted informant in ethnographic research. They were the common practitioners of science handling new and old knowledge to face the emergencies and trivialities of medical practice in the tropics. They dealt with cholera, malaria, plague, smallpox, cancer, syphillis, tuberculosis, typhus, and the like. They dealt with these diseases when germ theory became the main instrument to understand, and act upon, the pestilences that afflicted and killed the populations in the tropics. In the documents they produced, we can follow some of the reflections, hesitations and certainties regarding the etiology of infectious diseases in the tropics. The discussions were contemporary to the consolidation of bacteriology and germ theory in European medical science. Some of the elements of those discussions became a part of the stabilized model for infectious diseases - and, as we will see later, part of those elements derived from their social, cultural and political context.

Throughout the documents we are presented with a Goa that was frequently ravaged by plagues and familiar to endemic illnesses. There was malaria, under its different names of qualified fevers (palustres, remitentes, intermitentes, terçãs, quartãs, and alike); there was cholera, bubonic plague, smallpox, tuberculosis, and many others. Since the early

years of colonization, large numbers of Europeans in India died of 'exotic diseases' for which they were not prepared. They needed to be treated and they asked the royalty for physicians, not only to assist the ill, but also to train locals in the practice of medical assistance. After a number of deaths among the higher colonial officers, in the 17th century, a governor refers to Goa as a 'graveyard of the Portuguese'.[1] In a letter to the Secretary of Overseas Affairs in 1687, the governor begs to have two or three medical professors sent over to India in order to teach medical arts to the locals:

> If two or three masters [of medicine] came to this state, they would teach physic [medicine] to many locals who are quite acute and easily would learn, and those should not be the worse that the Hospital would have many physicians to assist the illnesses of the vassals of Your Majesty.[2]

After that, and starting in 1703, the basics of medical knowledge were taught to locals at the Royal Hospital. Due to the lack of qualified teachers, the course was not offered on a regular basis. In 1801 it was fixed as a three-year program, under the name of 'Medical and Surgical Class of the Military Hospital of Goa' (*Aula de Medicina e Cirurgia do Hospital Militar de Goa*). The curriculum included the teaching of Anatomy, Physiology, Pathology, Botanic, Chemistry, and General Medicine (the latter with an emphasis on the hypocratic aphorisms). This went through several changes, and, in 1842, after a unsatisfying evaluation, the program was completely restructured. It was the beginning of the Medical- Surgical School of Goa. In 1847 a curriculum for pharmacists was added. Those courses went through a number of difficulties through the years: lack of infrastructure, lack of qualified teachers, decaying conditions, scarcity of means, and a kind of subalternization of the doctors who graduated from there. In fact, those doctors could not practice in Portugal and they were not acknowledged on a equal basis as those who graduated from Coimbra or Lisbon. Physicians from the school of Goa were the medical workforce for other parts of the empire; they would serve either locally or in Mozambique, and, at a later moment, in Guiné, Angola, or Timor. In order to practice in Portugal, or to be able to teach at their own medical school of Goa, they had to go through the medical schools of Portugal and repeat their courses.

There is plenty of documentation produced by the Medical School. On the one hand, there are the reports about the Schools, its problems, accomplishments, students, events, buildings, curricula, publications. On the other hand, there are the documents produced by the doctors who either had learned there or taught there. Both kinds of documents can be used, by researchers of today, as a window to the lives, works, minds and social context of those physicians.

For our project, the most interesting documents are those which reflect the practitioners= perception and attitudes about illnesses experienced locally. For instance, they refer to smallpox and the complexities associated with vaccination, either technical (related to the production and conservation of serum in site) or cultural (hindus preferred the practice of variolation, plus they gave smallpox a positive understanding related to the visit of Sitala, the goddess of smallpox). They refer to the waves of cholera and include abundant elaboration about its etiology. Should waters, or the air, be blamed? Was it possible that microscopic beings inhabited the waters and were solely responsible for such intense devastation? Was it not transmissible from person to person? As for plague, it appeared as the insidious threat from the nearby enemy, that is to say, British India. It came in sacks of cereal, it appeared as rats and mice, it was signaled by the occasional death of one person or another. Soon, plague was feared as a general wave: a threat, an invasion.

Attitudes towards plague epitomize a point I want to make. The reports reveal the pervasive style of the military narrative in medical writing and thinking . They mention the enemy, they refer to the invasion, they point out the defense and protection needed.

A similar report on malaria:

> It is beyond doubt that the parasite of malaria s the uterine brother of the native that does not leave him form crate to grave remaining in unstable balance in the organism to achieve virulence according to the terrain of its germination. And if our medical-scientific research went further ahead, it might discover that the organc terrains cultivated by the hematozoaire give an easy access to its first cousin from the microbiotic flora, to *take the organism by assault*. Once altered the basis for

> the bio-functional process it makes the organism *vulnerable and apt to be game for or enemies*. (...) the direct *fight against* the micro-organism is not always possible, because it would be a fight against nature itself, which has given it in its smallness, in its prodigious fecundity and admirable latency of life, one of the best weapons for its protection. Under these circumstances what one ought do is to garnish possibly the *gates* of its entry, the means for *organic resistance*.[3]

This style is even reinforced in the description of the functions of the human organism in interaction with the malarial enemies:

> One of the best and most important organic defense *barrcks* is the liver, *placed right at the front*, it is like the *vigilant sentinel* that protects the inhabitant of the warm climates from the *constant attacks* by its enemies. It is its constant activity that makes it the most vulnerable organ in the warm climates.[4]

There is a particularly interesting piece on a earlier document, a local medical book from 1885, when germ theory was not yet firmly established. The author argues for other perspectives, and he ironizes the idea of microbes reinforcing the warfare imagery used in germ theory:

> ...surrounded at all sides and all the time by those assaulters, invisible spies, who insinuate themselves in the air that we breath, in the water that we drink, in the foods we ingest, that make their homes in our teguments, in the lungs, in the blood and even in the bones....[5]

Not everybody accepted germ theory in 1885. But in the 20th century it comes as the official knowledge in the documents. The new theory comes intertwined with a few non-medical elements that I want to highlight. They were not just medical documents, *they were military reports that provide us insight of what the sanitary endeavor was really like in the colonial tropics*. Doctors were also military men. Diseases were also the *enemy* in the military sense of the term. So were the strategies of response to disease, and the protection devices, and the language used to frame and elaborate on action. The written documents are pervaded by military references: they evoke the front and the confrontation between good and evil. Diseases are not just 'diseases', they are enemy. The concept of 'enemy' eventually accounted for a number of other subjects: sometimes the natives, sometimes their culture, and sometimes the political and military enemy of Goa: British India.

Confrontation, strategies, militaries, combats, war, citadels, and the like, are a concatenation of vocabulary that overlaps in the different areas in which our subjects were involved. The authors of the reports were not just doctors, but also military men, administrators, and colonial authorities. There is a kind of porosity between these different aspects and personas which seems to influence their language and mind styles.

It is our understanding that many of our conceptual tools, representations, language and imagery on the culture of infectious diseases was largely influenced by the exercise of medicine in a military context. Even if the medical and military spheres seem quite separate today, many of the models we use to understand, to represent , and to act upon disease are filled with military imagery. Infectious diseases are framed in terms of 'invasions' by alien microbes. The immune system is represented as an army with the function of defending the organism from the assaults of its enemies, the microbes that cause diseases. Microbes are demonized and the human body is thought as a citadel with the need of a specialized protection. Lymphocites are seen as soldiers that work against invaders from outside like the microbes. There is an pervasive presence of an opposition between a self and an other whose primary form of interaction is war.

Where does all this imagery comes from? I do not think that the analysis of a particular colonial setting gives a definite answer to the problem, but I sustain that the factual porosity between the military and medical spheres at the early periods of consolidation of bacteriology had a large role in the establishment of warfare models as a central reference in the science of infectious diseases.

(continued on p. 8)

Understanding scientific research on the periphery: towards a new sociological approach?

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The central question addressed by this paper is how to explain scientific practices performed by actors within the framework of peripheral societies. By 'peripheral societies' is meant those where science has developed at a later date and in conditions specific to the most dynamic institutional contexts, particularly in western Europe and the United States. To this end, I shall analyse briefly the principal problems deriving from the conception of science as an international activity, and more specifically the play of elements present in the contexts of the emergence of local scientific communities. I shall then go on to analyse the consequences of the trends in the sociology of science which have emerged over the last twenty years and, finally, by way of illustration, I shall analyse one particular case history in one molecular biology laboratory in Argentina, which exemplifies a phenomenon that I refer to as "subordinated integration".

The universal and the local: some 'classical' approaches

There has appeared in recent years a certain body of literature in the sociology (and, of course, the history) of science, which from various standpoints has brought up the problem of the national and international range of scientific practices. The problem is, incidentally, not a new one: the universal nature (and validity) of science are topics which has been recognised for many decades. There are, however, more recent currents of thought which may reverse the terms of the debate. I am referring to the theoretical and methodological contributions made by the various trends which have been emerging and developing since the 1970s and which have in fact meant the break-up of the Mertonian paradigm in the sociology of science.

Indeed, for the classical canon of the sociology of science, the universal nature of scientific practices worked as a general postulate, an apriorism which needed no questioning and was verified by means of the well-known rule of universalism characteristic of the ethos of science. Neither can the problem apparently be solved in authors who, like Ben-David, have effectively taken into account certain local dimensions in studying scientific communities and their roles in different types of societies. Their analysis, which is distinctly mechanistic, puts the emphasis on the presence or absence of the objective conditions deemed necessary for the development of a so-called "modern" scientific profession.

More recently, Lewis Pyenson's well-known books, devoted to understanding the spread of the major trends in certain disciplines (in particular those of physics and astronomy) centred particularly on Germany and France, propose an analysis of the relationships between the knowledge production in the metropolises and the slower-developing societies which work as "recipients" of this knowledge.[2] Thus, for example, Pyenson partially criticises the approach of "dependence theory" outlined by Thornton[3] according to which "the people in a dominated culture are disposed to accept that their vision is inferior, and to accept the culture of the conqueror". On the other hand, he says that German physicists and astronomers do not fit comfortably into dependence theory since, according to him, "the German scientists who laid the foundations of scientific knowledge were dominated by a horror of mediocrity".[4] Pyenson adds that many scientists felt frustrated in the 1920s by material and human shortcomings which hampered their work in peripheral societies: the equipment would not arrive on time or was unusable; scientific literature was in short supply or impossible to obtain; assistants were difficult to train and, when trained, were difficult to maintain.

Nevertheless, Pyenson, who was writing from the perspective of an analytical model which focused on the spread of knowledge from the

metropolises, seems not to be aware of the potential and characteristics which the construction of true research traditions acquire in the societies he analyses. These inseparably socio-cognitive traditions are of necessity articulated over several generations and include, though not as an exclusive resource, the performance of scientists from the metropolises. The implied relationships are, in fact, more complex than the model furnished by Pyenson.

What has allowed these problems to be posed from a perspective undoubtedly more appropriate for understanding scientific practices in general, has been the large number of studies of an empirical nature which have developed over the last few decades. These trends rejected the postulate of the universality of classical sociology on the basis two suppositions. The first of these is that science is not an autonomous sphere of intellectual operations. In constructivist sociology (a term which embraces most of the trends to have emerged since the end of the 1970s) science is presented as something which is no different from (or is reducible to) other alternative forms of cognitive and social effort. In short, science described and understood totally as a socially determined activity. The second of these suppositions which has distanced it from classical analyses has been its concern with the essence of laboratory practices. Thus, sociologists analyse the strengths present in the statement and general acceptance of specific scientific formulations, and aim directly at the content of the investigation.[5]

There are therefore two basic points of tension which I am proposing in order to come to grips with science and scientific practices within the framework of societies normally defined as peripheral, particularly as regards the patterns of modernisation implied in the processes of industrialisation and, more recently, of what are referred to as post-industrial societies. The first trade-off refers us to a certain dynamic peculiar to science on the international stage, as against the constellation of factors prevailing in the local contexts in which scientific practices develop.

This trade-off, which has frequently been approached from the perspective of centre-periphery relationships, involves two specific areas which must be looked at more closely in several ways: in the first place, the very concept of a "centre" is questionable. Insofar as it is understood in an acritical way (more often than not the case), it refers vaguely to a diffuse grouping of institutions, actors, practices and cognitive contents (collectively referred to under the heading of the mainstream of international science), which are usually very heterogeneous and having notable differences between countries, disciplines and institutions.[6] Otherwise, not all of these elements belonging to the institutions of the "centre" are equally relevant when it comes to analysing the development of scientific practices taking place in a peripheral context. It is in this single sense that works such as Pyenson's may be relevant, insofar as they have shown the way in which historically determined research groups in some peripheral societies have organised themselves, although his analysis, as I have already pointed out, is orientated above all around showing the influence of particular individuals from specific social and cognitive areas of the various different "metropolises". Finally, it is necessary to ask whether it is sufficient that a certain group be found in some of the countries or institutes of greatest relevance in the consideration of the majority of the actors in a given discipline in order for it to be automatically tagged as group belonging to the mainstream.[7] Plentiful examples give evidence to the contrary, and analyses such as those proposed by Harry Collins for the identification of what this author denominates the core-sets in the study of the controversies may very well be suitable for identifying the most dynamic groups within each particular discipline.[8]

Secondly, on the other hand, the scientific communities in the peripheral countries do not constitute homogeneous spaces either, beyond the sociological implications that the term "community" would seem to imply (and indeed did imply for much of classical sociology). Thus, the research groups, institutions and practices present by analogy substantive differences for example in each of the institutional and disciplinary fields. In this sense, the identification of the different traditions which gradually developed within particular scientific fields, turns out to be a basic task for the analysis of this point of tension. Indeed, very often the different traditions are to be distinguished amongst by a first broad line drawn between these groups and individuals who are more "integrated" with groups located in institutions and research groups of the "centre", and other groups who have not yet displayed these forms of relationship. Bringing this aspect into perspective will surely show us a local "scientific community" which, contrary to

a certain idealised vision, is deeply segmented with what are often deep hiatuses. In the last part of this work I shall attempt to illustrate this.

Thirdly, once it has been possible to think of the "centre-periphery" relationships in more complex terms than I have proposed, it is effectively necessary to think of the problem from a dynamic and relational perspective. In other words, if it is possible to identify the weft of international relationships displayed by certain research groups in the framework of a local society, this perspective should not then be abandoned in order to deepen an "internal" analysis of these groups' dynamics, leaving aside this character, especially when the "external" links with certain groups, located in "central" centres and institutes are particularly relevant to an understanding of the make-up of the local traditions implied.

Towards a new approach

The second point of tension which it is necessary to bring out, refers to the means of approach through which practices within the framework of a "peripheral" context will have to be studied. I have already highlighted the limitations which classical sociology of science presented, in order to develop these studies further, and which derived from its incapacity to link the social context of emerging scientific practices to the internal relationships in the production (some might say "manufacture") of knowledge, as well as to the contents of that knowledge. The emergence of new trends, which generically I shall call "constructivist", has made possible two movements: the first has been the change of object; that is to say, the possibility of establishing some explanatory hypotheses between these three levels of analysis which classical sociology left on one side. Thus, even if at times a slant has predominated which excessively addressed itself to the social and political factors involved, the processes of knowledge production were placed in a space of determinations which caused the dynamics present in local societies to cross the field of scientific work in the same way they crossed any other space of social, symbolic and material interaction. Hence notions arise such as "interests", "allies", "transepistemic arenas of research" and "resource relationships", to name but a few.[9]

Secondly, this new way of carrying out research necessarily implied entering into the spaces where knowledge is produced (as well as negotiated, certified and validated), since this was the only way possible to identify the actors, the content of their practices and the resources they mobilise.

Within the last ten years a new generation of the sociology of science has been evolving, partly in parallel with and partly against the constructivist sociology of knowledge. This new generation may be referred to as "neo-institutional". This sociology takes into account the role of restrictions in scientific practice, and describes scientific research along two lines of thought: cognitive conditioning that is associated with the achievement of the intellectual career (conditioning in the forms of reasoning, work practices, tests, evaluation and publication criteria); and socio-strategic conditioning which is associated with the maintenance of or growth in professional reputation. This two-pronged analytical framework permits the analysis of economic, political and positional factors on a par with intellectual factors, such as the selection of topics for investigation, instrumentation, reasoning processes and evaluation criteria. This approach makes constant reference to scientific institutions, their supposed operating rules, aspirations and professional realities, and to the history and traditions of science. In this sociological trend, all of these elements go to make up a weft which guides and limits the actions of its practitioners. The observations of scientists on the subject of the physical environment are examined according to the meanings which their actors give them. This treatment of scientific results contrasts with the constructivist interpretation, in which the findings of the research and the physical environment are simply subordinated to the role of resources, mobilised by practitioners in their attempts to ascend in the social, political economic or professional environment.[10]

The analysis of the problem of "peripherality", when analysing it from this new perspective, may illuminate aspects which remain hidden (in classical sociology), or which have been presented in such a way that they are merely the result of the practitioners' skill in mobilising resources which impose their point of view on the other actors (constructivist sociology). Here, on the contrary, these resources are analysed as components in a field of dynamic interactions, where the prevalence of any one of these components is not supposed a priori.

"Peripheral science" or science "in" the

peripheral countries?

Hebe Vessuri, in one of the first works, which, in the framework of Latin America, was an attempt at understanding the "peripheral nature" of scientific knowledge and of the effect of the socio-cultural context on the latter, has distinguished three levels of analysis: the scientific concepts, research subjects and institutions.

About the first of these, Vessuri states that "conceptual development has less chance of success in Latin America due to the risks which the creation of genuinely new knowledge presupposes both in terms of its financial and intellectual cost. The scientific communities of the periphery are more conservative than those of the centre and work almost exclusively within the parameters of "normal" science, in the search for solutions to puzzles whose basic ideas have been conceived elsewhere."[11]

At the level of research subjects this author states that in the basic disciplines, the contributions that scientists are in a position to make from the periphery, especially in "mature" disciplines resides more in the application of a science governed by social needs, than in a truly "pure science" which is perceived as being "more scientific". The most significant case here would be that of medicine.

The level of scientific institutions is to be found in the consideration of its relationships with society, and implies the way power relationships come into play between men, determining work methods, modes of transference and the diffusion of information. According to Papon (1978), they are the concrete expression of the structures and social mentalities which largely shape the mode of oduction of scientific knowledge.

From this perspective, the socio-cultural contexts situated on the periphery would seem to operate as a basic restriction on the consolidation of successful research teams in terms of the evaluation of their peers in the "international scientific community".

The Peruvian historian Marcos Cueto (1989) prefers to point up the distinction between peripheral science and what he calls science on the periphery. He considers that the latter of these terms is the more appropriate, since to speak of a peripheral science implies that the science of the slower-developing countries is of marginal importance to the heritage of knowledge in terms of resources, number of researchers and quality of subjects under study. Against this, he proposes the terms "science on the periphery" and "scientific excellence on the periphery" to highlight the fact that the scientific work in these countries has its own rules which must be understood not as symptoms of backwardness or modernity, but rather as a part of their own culture and interactions with international science.[12] The question that Cueto formulates is relevant, and refers to the tension which I mentioned before: how to understand the combination of creative, modern work in a cultural context which is supposedly traditional and "peripheral" to the centres of world science. Cueto introduces an important historical contextuation when he states that it is necessary to remember that the current distance which separates the science done by developed countries and that done by underdeveloped ones was not so wide in the past, and that this distance has rather tended to increase over the last forty years.

In a recent work, Cueto (1997) emphasises this tendency, by enquiring after the elements which played a significant role in successful operations in the construction of institutions under adverse conditions. He distinguishes five topics which read something like an agenda of problems: 1) concentration (as against the dispersion of resources and personnel); 2) utilitarianism: "the survival of scientific assignments under adverse conditions demands that its practitioners proclaim a certain degree of public utility for their work"; 3) nationalism, which may affect the selection of topics and eventually the content of science; 4) technology: this refers to the difficulties in obtaining equipment and materials, which has lead some researchers to make the equation between resources and products more efficient; and 5) networks: refers to how national and international networks or, more specifically, how the scientists of Latin America (or the periphery) are recruited in long-established networks.[13]

Cueto's reflections on the distinction of scientific excellence in peripheral countries are of interest, since they bring out the heterogeneous character of local scientific communities which the concept of peripheral science tends to blur and seems not only to erase the differences within particular scientific communities, but also between various scientific communities located in clearly differentiated contexts. Cueto's attribute of "excellence" is however more open to debate. True it is that he analyses some groups which have been widely recognised by the international community at large (the most representative being without doubt the Nobel Prize winner Bernardo Houssay in Argentina), but to consider this recognition, based incidentally on the assessment of contributions made by these groups, as the basis for distinction of a "successful" or "modern" task and as being less peripheral as a result, may lead to a skewed interpretation. If, as Cueto says, the distance between the science produced in certain countries and the international mainstream was not so wide in the past, there is no reason not to investigate the possible reasons for the widening of the current gap, together with the five topics he mentions and the characteristics of these successful groups.

To consider the three levels of analysis put forward by Vessuri is instructive here, since her first two pose the "peripheral" problem in relational terms, which Cueto acknowledges and emphasises, and her third level concentrates on the difficulties and restrictions peculiar to the local (institutional) context, which Cueto also acknowledges. Nevertheless, for a comprehensive analysis of this issue, Cueto considers it necessary to add some analytical dimensions a few of which I shall state briefly:

a) In the analysis of Cueto's five dimensions, it is necessary to add what Shinn and others (1996) have underlined as the role epistemology plays in creating new categories of knowledge, and in consolidating and institutionalising them. The presence of epistemological variables must be evaluated according to particular disciplines, lines and subjects of research as well as the way in which the contents are effectively built up by their actors.

b) The historical dimension and the establishment of specific traditions have already been mentioned. However, scientific traditions must be understood as something more than Petitjean, for example, describes. He points out that "the establishment of scientific traditions is the result of the fact that national public policies took science under their wing, as well as the occasional synthesis of elements from different cultures.[14] I suggest instead that we consider the articulation of scientific traditions as the establishment of more complex socio-cognitive spaces, as areas of cultural, political, cognitive and institutional identification, which are structured historically through inter-generational relationships, in the workplace and in the various different areas of institutional performance.

c) Most of the dimensions which Cueto points out as explanations of the "successful" career, in particular "utilitarianism, "nationalism" and technology", must be given more scope for explanation. This leads us to the wider problem of the existence of a sort of "contract" between science and society and, related to this, between science and State.[15] In short, as has been demonstrated by numerous authors, this is a matter of understanding that the relatively late development of scientific research in most peripheral societies responded rather to a double movement of imitation of so-called "western science" closely tied up with the ideal of modernisation on the one hand, and the widely held belief that scientific research was a fundamental element in the socio-economic processes linked to development on the other. This belief, which was associated with the idea of a linear model of innovation which began in basic science and ended in technological development and innovation, presupposed the need to generate a "stock" of knowledge available to be taken advantage of by the productive fabric.[16]

Indeed, in many countries knowledge was produced (of variable quality, certainly) which was put at the disposal of "society" at large. Nevertheless, over many decades and even today, the general problem of science in most countries of the periphery has stemmed from the rare or non-existent appropriation of locally produced knowledge by various social actors; I am referring to actors who are representative of the "productive fabric" as well as to any other actors in society.

The description of the constellation of factors which have operated in what is effectively a lack of appropriation of locally produced knowledge is a topic which has not yet been sufficiently researched. Naturally amongst these factors, can be mentioned elements peculiar to the logic of local scientific actors, such as the race to publish on the international stage, and consequently to define subjects and lines of enquiry which may fit in with these requirements better than they do with the potential needs of local societies or the content of public policies which in many cases have long emphasised the autonomy of the scientific sphere; as they also fit in with the dynamic of the actors "external" to knowledge production, in other words companies who, with the odd exception, have tended to underestimate or ignore locally produced knowledge. The same could be said of the use made of locally produced knowledge by the State itself to solve problems in each particular society, although, as Cueto rightly points out, there are some

significant exceptions in the area of medical research.[17]

Perhaps by turning the argument around, one could say that the production of "non-appropriated" knowledge and, in many cases "non appropriable" by most societies on the periphery, is in itself one of the few general traits which describe the role of scientific investigation in this type of society. Indeed, many of the commonly described problems such as lack of resources, "critical masses", institutional stability and so on, are related to the lack of legitimacy which, over time, scientific practices acquire in these societies. As a consequence of this, most actors see grave difficulties in the usefulness of financing a set of social practices whose benefits beyond the "community" are at best intangible and at worst non-existent.

d) In order to analyse the role of scientific practices within the communities of the periphery, it is not enough simply to identify the existence (or conditions for existence) and the trajectory of the predominant scientific traditions. Furthermore, it is necessary to perform two fundamental, complementary operations: on the one hand to analyse the interaction of those groups most representative of the traditions with their complex weft of social relations in the sense in which I explained it in the previous section (by putting the sort of contract made with civil society and with the State under the microscope.)

On the other hand, an investigation is essential which aims towards the interior of the traditions themselves. In this sense, it is necessary to penetrate beyond the walls of the laboratories in order to establish how a set of sociological parametres, essential for the understanding of the topics which have so far been discussed, operate and are articulated: such as the kind of cognitive conditioning associated with the success of the intellectual career (conditioning in forms of reasoning, working practices, tests, evaluation and publication criteria); and the socio-strategic conditioning associated with the maintenance or growth of professional reputation, strategies, limitations, networks, and so on. With this analytical arsenal deployed for the study of the scientific practices, we are in a position to suggest comprehensive, relational, contextualised explanations of the development of these practices within societies on the periphery.

"Peripheral modernity": An example of hypernormal integration

The following example is taken from an empirical investigation carried out some time ago on three molecular biology laboratories in England, France and Argentina. I am referring here to certain aspects which emerge from the analysis of the Argentinean case in particular.[18]

In the early 1980s, the director of one of the laboratory groups studied, was at the University of Cambridge, England, as a part of his post-doctorate studies. He had arrived there a while before on the recommendation of an old professor of his who had had to go into exile as a consequence of the military coup in Argentina in 1976.[19] Whilst he was working in this laboratory, the Argentinean researcher played an important part in the discovery of the fibronectine gene. This gene was especially interesting, since it showed a phenomenon unknown until then (and moreover anomalous). This phenomenon was what is now known as "alternative splicing": the form this gene "expresses" in more than one protein. The significance this process has acquired stems from the fact that it seems to contradict (which was indeed duly demonstrated) the central dogma of molecular biology stated for the first time by Francis Crick. The dogma said that there was a one-way flow of information as a co-linearity between DNA and proteins is produced: "In biological systems the genetic information always flows from the genes towards the message-carrying ribonucleic acids, and from the RNA to the proteins. This rapidly took the form of a DNA ° RNA° PROTEIN model in which, by the principle of co-linearity, a particular protein always corresponded to a particular gene."[20]

In the research carried out in Cambridge it was discovered that the fibronectine gene expressed in more than one protein, as I have already said. This was particularly relevant for the discipline and the articles published by the English group – with the Argentinean researcher's participation – had great repercussions, and immediately started being quoted in a good deal of articles written by other researchers belonging to the core-set of the discipline, and in particular, those who were studying the regulation of genetic expression.

When, in the mid 1980s, the researcher in question returned to Argentina and joined the laboratory that we were studying, he organised a work team with young researchers and doctorate students in order to continue researching the different peculiarities of the fibronectine gene. Meanwhile however, a handful of genes with the same capacity to express themselves in more than one protein had already been discovered in the English laboratory. Thus, the researchers in the laboratory in Argentina managed to gather an enormous amount of information on the different forms which the phenomenon took in each of the genes studied, by building a database which allowed them to investigate in depth the fundamental conceptual (theoretical) problem, which was "alternative splicing".

Meanwhile in the Buenos Aires laboratory, the research was being directed more and more towards deepening the knowledge of one gene in particular, and therefore losing sight of the conceptual phenomenon as a whole. This is a process which Lemaine (1980) has called "hypernormal science", or the fact of researching the smallest details of a certain phenomenon without being able to make (usually) any substantial contribution. This, however, brings to life Kuhn's statement about penetrating into all the cracks and crevices left open by the rule of a paradigm. Lemaine, who has researched this attitude in "central" countries, attributes to it the character of a conservative strategy on the part of the researchers.[21] The necessary corrections should be made, since this phenomenon in a peripheral context may turn out rather to be a substantial knowledge advance strategy insofar as the alternative strategy, which Lemaine would suggest is riskier, is quite simply impossible to put into practice owing to the lack of equipment; sufficiently well-trained researchers; a tradition that produces a sufficient quantity of young researchers for the reproduction of the model itself; more vigorous institutional incentives and, in most cases, an almost total indifference on the part of the private sector in the production of goods and services (especially inasmuch as the research in question shows no signs of having any immediate application to the system of production.)

One of the consequences of what has just been said is that the research group in Buenos Aires remains in contact with other international groups working in the same area (particularly with the British team) by offering information on the headway it is making in the "hyperspecification" of its line of research. And this has come about because, for the other groups involved, this specification is crucial to the completion of the "on-board bulletin" of the overall theoretical problem, and to pushing forward their own research. Indeed, an Italian team is playing a similar role to the Argentinean team in its relationship with the Cambridge laboratory.

Another consequence also emerges for the study of science in peripheral countries: just as the relationship of the Argentinean team with their English peers could be thought of in terms of a "subordinated integration", still I must bring out the phenomenon of integration itself, since thanks to this the Argentinean scientist can count on a considerable amount of information and can constantly discuss the progress of all the research on this subject. This suggests some difference with regard to other groups (the majority) in Argentina where, as there are no mechanisms of integration, find themselves isolated or at best manage to reproduce the relationships of subordinated integration. But within their own borders.

I must add that the kind of strategy-which I have labelled "subordinated integration" nevertheless makes it possible for groups such as the one studied to have the chance of gaining access to financing from abroad which they would otherwise find difficult to lay their hands on. From the point of view of the researchers who make up the Argentinean research group (and this point of view seems to be a common denominator in this mode of integration) everyday practice is perceived almost as a "heroic" activity which strives to produce knowledge at a level of excellence, despite the adverse conditions caused by a local context which is seen to be hostile or at least indifferent to the efforts they believe they are making. In this sense, the tradition founded by our illustrious predecessors Houssay and Leloir, who staked their claim on scientific excellence, but developed in Argentina, in Latin America, seems to be functioning at full capacity, despite the fact that conditions are shifting faster than ever.

NOTES

1. Institute for Social Studies of Science and Technology, National University of Quilmes, Argentina.
2. I refer specifically to two of Pyenson's works (1985 and 1993).
3. Archimbal Thornton's *Doctrines of Empire*, New York, 1965. This approach is not to be confused with the series of statements known as "dependence theory" (*teoría de la dependecia*) proposed by Latin American authors such as F.H. Cardoso and E. Faletto (1971).
4. Pyenson (1985) p. 307.
5. See Kreimer (1998); in particular Terry Shinn's excellent introduction.
6. Raj (1996) points out quite rightly that "...it is common to view "Northern" science as a homogeneous, undifferentiated whole, which was, or rather *not*, adequately transmitted to

the erstwhile colonised part of the globe. Yet, over the last decade, a growing number of studies have endeavoured to show that scientific practices and contents are different in the different cultures that constitute the "North" ... " (p. 285).
7. Shinn (1983) distinguishes a radical (or global) universality, such as that which has been proposed by the Mertonian school, from a restricted universality: "If scientific practice and discourse generally privilege a category of knowledge based on the global traits of the entities and on the conditions of their interaction, independently of the spatial and temporal variations, this expression of universality is not the only form of knowledge to exist. Another universality (equally comprehensible, coherent and rigorous) is addressed instead to the local manifestations of the phenomena; by reflecting the local dimensions of global happenings it puts the emphasis not on an idealised representation but rather on the details, particularisms and anomalies of the objects and actions. This class of universality, i.e. restricted universality, tends to prevail in the community of experimenters, where the object of the research enforces certain social and cognitive restrictions."
8. See Collins (1981).
9. To get an idea of how these concepts are utilised, see for example, Latour and Woolgar (1978), Latour (1989), Knorr-Cetina (1981), Barnes (1974 and 1985). The idea of manufacture is well-exposed in Chalmers (1990).
10. The description of this trend I owe to Terry Shinn, one of its best and brilliant exponents.
11. Vessuri (1983) p. 17.
12. Cueto (1988) p. 28.
13. Cueto (1997) pp. 239-243.
14. Petitjean (1996) p. 8. *My italics.*
15. Some of the classical analyses which have pointed out the existence of this sort of contract are Price (1965), Salomon (1970) and Rose and Rose (1972). More recently, Rip and Van der Meulen (1996), Elzinga and Jamison (1995); and Cozens and Gieryn (1990).
16. For a general analysis, see the collaboration by Salomon, Sagasti and Sachs (1994).
17. Pyenson, for example, suggests that "Europeans at the time thought that the problem lay with an inability of non-Westerners to understand scientific logic. Yet analytical reasoning had little to do with the matter, for in fields of knowledge based on description and classifying – pathology, geology and the like – Argentines and Chinese had by the 1920s made valuable contributions. At the same time, the mathematical tools of exact sciences did not pose a problem of assimilation, for mathematical manipulation, much like cooking chemicals or collecting butterflies, was a technique that could be mastered. On the contrary, it was the implicit picture of the world firing the imagination of researchers in exact sciences that found so few receptive minds. *While technology easily leapt over cultural boundaries, science remained culture-bound.*" Pyenson (1983) p. 306. I understand that the problem is exactly the inverse; if things were this way round, the production of scientific knowledge in the countries on the periphery would have no trouble responding to the needs of each local society.
18 See Kreimer (1997a)
19. I have tried to show elsewhere how scientific migrations constitute a basis for the introduction of new subjects and new lines of enquiry into peripheral contexts. See Kreimer (1997b).
20. See the excellent history written by François Gros (1986) as well as Morange (1994)
21 Lemaine's research on hypernormal science constitutes a sound sample of the heterogeneity of the scientific practices of the "centre".

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STS and the EU's Fifth Framework Program.

Presidential Address, Lisbon, October 1998

by Rob Hagendijk

Introduction

"European science and technology cannot advance... without the contribution of the social sciences. Science and technology without the social sciences are incomplete, if only for the reason that science and technology are themselves social constructs which require adequate reflection."

With these words Dr José Mariano Gago, the Portuguese Minister for Science and Technology, and our special guest today, addressed a workshop of social scientists and ministers for science and technology policy organized by him in Lisbon in April 1997. Just elected as EASST's president, I attended Gago's workshop and was pleasantly surprised both by his words and by the general attitude of the politicians present. The goal of the conference was to discuss provisions that would stimulate the contribution of the social sciences to the Fifth Framework Program for the science and technology policy of the European Union — a goal with which I happily agreed. Not just because of the money, but because I fully agree with Gago's diagnoses just quoted. More generally, I am convinced that the problems that accompany the formation and development of the EU cannot be adequately dealt with without a considerably enlarged role of social and cultural research and reflection upon its results.

So, I find the enthusiasm of politicians for the social sciences, and Dr. Gago's in particular, heartwarming. Yet, it also makes one wonder how we will ever be able to meet the rising expectations, or should I say the rising demands, directed at us? What position should we adopt vis-a-vis EU policies? Europe and the world at-large are changing at an unprecedented pace, and many of these changes have to do with science and technology. Politicians and policymakers are looking our way for help and clarification. What can we offer them and how do we position ourselves as a field of research and development within these processes? These are the key questions for STS in Europe — questions we will have to grapple with in the coming days, if not the next couple of years.

Of course, there are also excellent intellectual reasons to be interested in European developments at the end of the 20th century. It is becoming a sort of *in vivo* experiment and an ideal site for comparative research. The institutional transformations in Eastern, as well as Central and Western, Europe generate enormous problems and profound dilemmas that have to be addressed by local, national, and supranational administrations. Enterprises, universities and research laboratories are challenged by rapid scientific and technical developments. So, there is ample room for comparative, as well as longitudinal, research that addresses the intellectual, cultural and political problems of our times, problems that should interest us and the social sciences at-large enormously, if only out of intellectual curiosity. But Gago and his colleagues want more. They not only want us to do that research, but they also want us to do it in such a way that it helps them try and solve the problems and helps them find acceptable answers to the dilemma's with which they are confronted. How should we take up these challenges?

In discussions about our relation to the policy domain, the same arguments surface time and again. Some of us argue we should stay aloof and keep our distance; they insist on maintaining their academic independence. Or, they prefer to cultivate the well-known role of the critical intellectual interrogating policies and developments instead of serving the centers of power. Others argue social scientists should become partisans and should be mobilized on behalf of social movements that fight the course of events in Europe and the EU. Still others will argue in favor of applied research and consultancy. For some, this latter question may be at least inspired by their wish to find a job in the area of their expertise, in a period in which more secure jobs in academia are not available.

In sketching these positions I am not passing a normative judgement on any of them, because I do not believe that questions about our involvement in EU policy can or should be answered in such an abstract manner. The answers given should and will depend on much more specific conditions and considerations. The locally contingent nature of scientific practice has at best a distant and indirect relation to such general debates. We know this from studying other scientists and we may assume it also applies to us. So, to come up with a basis for practical answers, in the least we have to inspect in much more in detail the structure and functioning of the Fifth Framework Program at its current stage of development.

The Fifth Framework Program

The Fifth Framework Program can be seen as a very complex space structured along politico-economic, cultural, normative and techno-scientific dimensions. In this space there are a number of spots at which the social sciences can make themselves heard and some niches where they are expected to make their contribution. Spots and niches do overlap, but certainly not completely.

If we look at the ways in which the expected contributions from the social sciences are defined we can observe two things. First, the space for the social sciences within the program will probably be larger than under its predecessor. There will be considerable room for new initiatives, especially in the domain of 'human mobility' and 'the socio-economic knowledge base', and this is a positive development. Second, it is also clear that the program as a whole is still heavily biased, intellectually and financially, against the social and cultural sciences, i.e., against appropriate reflection on the social, cultural and political dimensions of socio-technical change. Let me elaborate on this.

The largest part of the funds of the proposed Fifth Framework Program will be spent on the first key action. In this part of the program, all sorts of problems and technologies are mentioned that should be dealt with in specific programs, for example, health and food technologies, the development of the information society, problems of agricultural development, biotechnology, transport and mobility, the city's of tomorrow, and climactic change. All these topics are quite familiar to us and, in the more recent versions of the proposed program, it is stated explicitly. I quote, "Particular attention will be taken of the economic and social implications, use and effects of the technologies and processes involved in each of these programs."

This statement is encouraging, especially as it was not included in that form in the documents available at the time of the April 1997 workshop mentioned above. It signals the widening of the program for STS and offers opportunities for us to enlarge our contribution. So, there are apparently developments going on that we should welcome and I am happy to do so here. Nevertheless, at least two observations that are more critical should be mentioned at the same time.

One may argue, first, that the statement I just quoted contains a specific view of science and technology in relation to the social research indicated. It seems to indicate a sort of black-box conception of science and technology. The quote suggests that economics and the social sciences should deal with the pre-conditions, diffusion and effects of technical change, but not with its substance.

But, may be I am splitting hairs. One might say that to interpret this one sentence in this particular way is an over-sensitive reaction of someone immersed for more than a decade in science studies; maybe no black-boxed conception of science and technology was intended. In any case, it is hard to tell whether this is true, as not much more is said in this part of the program about the social sciences in relation to science and technology. That remains for further elaboration in future documents. This brings me to my second comment.

Apart from the passage just quoted, no mention is made of the social sciences in the document covering the first part of the new program. This is understandable, as the latest proposal studiously avoids explicit mention of particular scientific disciplines. Socio-economic, cultural, and techno-scientific issues are sketched but nothing more. In a way, this is an improvement over the previous documents. In these previous documents, the broad sketches of issues and problems led to the identification of fields of science that would be central to the activity, but, in those covered, the social and cultural sciences were absent. As if food, health and information technologies are not cultural and social issues *par excellence*! So, in that respect, the current proposal seems an improvement — rather no specification at all at this stage, than to be excluded beforehand. In its current form, the document leaves room for further discussion and specification of the fields

of knowledge and expertise that should be mobilized. And, actually, these discussions are being organized right now.

Nevertheless, I am not too optimistic about this further elaboration of the program, as far as STS is concerned. STS is a small, interdisciplinary field with diverse intellectual roots that pull its practitioners apart. As a field, it tends to be badly represented in debates in which all sorts of perspectives and disciplines are supposed to have a part. Looking back over the last two decades, the field seems to have become more divided internally, both with regard to the theoretical perspectives adopted and with regard to the sorts of analysis that are being pursued. Intellectual exchange between researchers doing quantitative research and those engaged in historical or ethnographic work seems to have almost disappeared. The growing importance of science and technology in everyday life has itself contributed to a considerable increase in the number of thematic issues on which one may concentrate. Some examples are risk, public understanding, science and the law, and regulation. And, each of these themes may be studied with particular object domains in mind, such as health, agriculture, city's, transport, etc.

We seem to be a weak field because of this enormous variation in themes and object domains, as well as in theoretical and methodological orientations and predilections. Yet, what seems to be a weakness at first sight may actually point out our strength — our field is extremely varied and intellectually rich. Furthermore, our field is unique in the way in which it relates to the work done by scientists and engineers. Our relationship with technology, the natural sciences, and medicine is clearly different from other areas in the humanities and social sciences. If it comes to building bridges between society and science and technology, we may have a unique vantage-point.

We should, then, take advantage of our unique position, exploiting our diversity in intellectual resources and our relations with scientists and engineers. We should not only do so in order to develop our theories, knowledge and understanding, but also to contribute to better-informed policies and to a more effective and broader participation in processes of social, cultural and technical change.

Perhaps some people will disagree with what I have just said. It might be argued that the differentiation has led to a dysfunctional fragmentation of the field. Have we not divided our limited resources over too many themes and domains to be effective? Should we not operate more programmatically and in a more coordinated fashion? Should we not join forces and develop a limited number of coordinated, and preferably comparative and quantitative, projects?

No doubt, fragmentation is a threat to the field. Fragmentation may occur and does occur, and we should counteract such tendencies. Nevertheless, I do not think it would be wise to attempt this in such a manner that the diversity of the field would be sacrificed. Our diversity should be better exploited, but it should not be sacrificed in a way that will only make us poorer in the end. In this respect, our situation is similar to the EU itself — cultural diversity is something to be celebrated and cherished, instead of something to be extinguished. Cultural diversity is as much a resource as biodiversity. It may enhance the capacity to survive and adapt to changing circumstances.

In order to avoid a digression from diversity into fragmentation we have to coordinate our activities better, we have to discuss the research agendas for themes and domains in a more systematic fashion, and we have to explore possibilities for collaboration and exchange across national and institutional boundaries more vigorously. Last, but not least, we should improve our arrangements for training and educating younger researchers, so they will be able to confront the problems that lie ahead and require international collaboration.

In all these respects, initiatives have been taken and a lot are already going on. But, it is my strong belief that much more needs to be done in each of the directions just mentioned. New ways have to be found to combine the training of young researchers with the discussion and development of the research agenda of the future. This can be done by organizing workshops and conferences in selected areas corresponding to items on the policy agenda, as exemplified by the Fifth Framework Program. The program for this conference shows there are already a number of areas in which we have sufficient mass to take further initiatives. In other areas, the conference program shows that it is within reach to build such a critical mass, provided we take initiatives and look for support from outside.

If we think of our positions within the larger context of European science policy, we might improve our situation further as long as we do not restrict our discussions to 'card-carrying' members of the STS community. Such discussions should include exchanges with the scientists and engineers whose work we seek to analyze. It should also include intellectual exchange with neighboring fields, such as ethics, political theory, anthropology, studies of legal issues, cultural studies, and economics, to mention some of the more obvious. I am as much convinced that we can learn from them as I am convinced that they might profit from our experience and theoretical reflections.

Long-term perspectives and normative commitments

Let me conclude by adding two further items for future debate about our agendas and priorities.

First, it is particularly important to take a long-term perspective on today's problems. The temporal order of our intellectual agenda is probably different from the short-term needs of the political arenas, and those carving out a career for themselves in them. But, history shows most problems take longer to solve, outliving the period between elections or the stages between turning points in bureaucratic careers. It is our intellectual and moral duty to investigate how and to what extent today's puzzles are repetitions of those of yesterday and the years before. Such an investigation should also address the ways in which specialist professionals and citizens have participated in defining the problems and the attempts to cope with them. The second requirement for discussions of research agendas and priorities is that we should organize them in such a way that the normative implications of our theoretical and methodological choices are considered and reflected upon.

These last two points are related, of course. It would be rather naïve to assume that technical choices are normatively neutral and do not affect the lives and the practices we study. A long-term perspective concerning the ways in which scientists, engineers, and people like ourselves have related to the practical exigencies of solving concrete problems may help us become, and remain, reflexively alert to the normative dimension of our work.

I think that Ted Porter has done extremely valuable work in this respect, in his book *Trust in Numbers*. That book analyzes how various sorts of engineers, accountants and social scientists have been involved in creating today's world, while developing their own field at the same time. It provides us with important items for our research agenda and an example of how we might proceed. And we have to proceed, because the book also makes clear that the political, theoretical, and normative evaluation of the contributions of the social sciences to social developments is underdeveloped.

A more rational discussion of problems of involvement and detachment vis-a-vis the problems of society can only be realized if we develop an historically-informed, as well as political, assessment of our daily work and field as a whole. And, also in this respect, we should see to it that practical involvement and critical reflection are developed even-handedly and in step with one another.

Portuguese Minister Challenges EASST:

Can STS Contribute to European Science Policy?

a report by Leen Dresen

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In his opening address to the EASST Conference in Lisbon, 1 October 1998, Dr. José Mariano Gago, Minister for Science and Technology, started by outlining the political playing field that he would like the EASST community to engage in: the science and technology policy of the European Union. Among the political domains that European policy-making covers at present, science and technology policy is a relatively new domain. European science and technology policy has up till now been limited to areas of research linked to goals like industrial competetiveness. This means that even recently, an intended programme of health research had to be shown to be of importance to industrial competetiveness first, before it could be funded under European programming. Present day science and technology policy of the European Union can therefore be said to be still in its infancy, when compared to the far more comprehensive science and technology policies of the individual member states.

This immaturity of European science and technology policy is however not exceptional, for at the moment there is no mature European policy yet in any political domain, with the single exception of the current European monetary policy towards a joint single currency, the Euro. If that particular policy succeeds - and the minister added he sincerely hopes it does - the next political debate within the European Union will be about European institutions; about the general institutional arrangements needed for mature governance at the European level, and about the more detailed institutional arrangements needed for specific policy domains like a more comprehensive European science and technology policy.

It was at this point in his speech that minister Gago challenged his audience to engage in the upcoming political debate about the future institutions of European science and technology policy. While doing so, he stressed the importance of timing in this respect, and pointed to the unique window of opportunity opening over this issue somewhere during the next decade. During this short period, before political decision-making solidifies, it will be possible to influence the construction of institutional arrangements that may last for the rest of the coming century, and that will shape the future character of science in Europe. Minister Gago pointed out that it is very much down to communities like the EASST community gathered here in front of him today to shape the intellectual preconditions for the upcoming political debate about the future of European science and technology policy. We should realize that at the moment such intellectual preconditions are seriously lacking within the responsible political and administrative settings. If the political debate took place next year, European politicians and policy-makers would simply *not* be prepared for it. What we may then expect to happen is that, pressed for time and intellectual input, a set of seemingly appropriate nation state level institutions will be copied, like those of the United States of America.

The minister would therefore strongly welcome studies that would help to create the intellectual preconditions he thinks are needed for the upcoming political debate about the future of science and technology policy in Europe. Such studies would for instance include an evaluation of the successes and shortcomings of nation state level institutions for science and technology policy, and an analysis of their (un-) suitedness for the European situation. Without such critical analysis *soon*, we are very likely to end up with the default thing to do: just copying the United States institutional arrangements in this respect. Another example of what could be investigated by science studies in this respect is the failed attempt at establishing an Academia Europea about 15 years ago. Why did this attempt fail? Also worthy of our analysis is the decision-making proces surrounding the formulation of the 5th Framework Programme over the last year or two. Judging from his own experiences during the process he would say this is a subject very much in need of a social study of science - to which he will gladly cooperate by supplying his own recollections. He would say that the relatively ill-prepared and ad hoc policy-making that he found typical of the decision-making surrounding the 5th Framework Programme would be inconceivable for a comparable policy-making effort at the national member state level.

An additional reason why science studies would be very welcome to contribute to the political debate about the future of European science and technology policy is that the institutional memory of the administrators involved tends to be very short. For instance: when the European Council of science and technology ministers will meet in October this year, he will be the oldest minister in office within that domain, being himself now three years in office. Under these circumstances, academic analysis can help to provide a more long term perspective, and contribute to European institutional memory and learning.

Minister Gago then went on to point out a number of implicit features of European science and technology policy that he would like to see questioned and challenged. One of these features is the marginal role allocated to the social sciences within the current European Framework Programmes. When it comes to giving credit to the social sciences, he has to say there is a marked lack of culture in most of his fellow-representatives within the Council. Likewise, most administrative policy-makers within the domain seem to be under-educated in this respect. Besides, most ministers still tend to be guided by their national interests. And national interests of European memberstates only rarely include the social sciences. For a long time it therefore seemed there would be sadly little social science included within the 5th Framework Programme; although the present result is not as bad as it at one stage threatened to be. While campaigning for a more explicit role for the social sciences in the 5th Framework Programme himself, minister Gago noticed that one particular argument kept being used against him during debate. This is the argument that "of course social science is crucially important, but it is oldfashioned to give it its own Key Action within the Programme. Instead social science aspects will be integrated into *all* Key Actions". This line of argument - and the related development in programming - might deserve our critical scrutiny as well.

One might wonder at this point why there should be so much sympathy in Portugal for the role of the social sciences, especially among members of Gago's own generation. The answer is because the social sciences, with two exceptions, where forbidden during his years of training as a student, under fascism in Portugal. The two social sciences allowed to be studied were geography and anthropology, because they could serve the national interests in the colonies. But sociology was regarded as dangerous. Although he was himself trained as a physicist, Gago has for this reason remained committed to the importance of social science as a source of freedom ever since.

A second feature of European science and technology policy that minister Gago would like to see challenged is the possible trend towards concentrated and highly specialized research centres. Without explicit political debate, this might be the implicit course that European science and technology policy is heading for. At the moment, all research-related industry in Europe is concentrated in the central parts of Europe, even if it was destroyed at those locations several times this century. If future European science and technology policy continues to be as strongly industry oriented as it is today, part of that future policy could be a withdrawl of science and technology investment from peripheral countries, to concentrate European research expertise at the industrial production centres of Europe.

The question one could ask is: why *do* small and peripheral countries like Portugal need - training in - science and technology? In case of Portugal the answer to this question is not to provide a research-base for domestic industry, but to provide the country with good teaching, health care and civil engineering. So a totally different answer than in say the case of Germany or Sweden. A future European policy that would seek to concentrate its science and technology investment in a limited number of locations will deprive the mayority of Europe of a balanced access to science. Under such a regime of specialization, Portugal would have to concentrate on something like biomedical science, while for instance Portugese mathematicians would have to migrate to centres of excellence elsewhere in Europe. In this matter too, the minister would very much like the STS community in Europe to express its views; for in the end the choice for a future European science

and technology policy is about the *social* consequences of the *variety* of sciences available in a certain country or region.

As a final point of consideration, Gago pointed out that we should realize that many countries in Latin America and Africa are looking especially to Europe for ideas and models in these matters. To countries in Latin America and Africa, Europe is a haven of democracy and wealth. Indeed, from our position of peace and wealth it is more easy to think about these problems in a balanced way. For in a country in poverty and turmoil it may be more tempting to abandon science policy for guerrilla warfare.

Speaking from this same global perspective, the minister ended his adress by admitting his worries over the recent trend towards relativism in European science studies. According to such relativist views, science and "truth" should be seen as constructs, stemming from the self-interest of scientists. We should keep in mind, the minster said, that such relativism undermines the positive role of science and technology as a source of freedom, citizenship, and a test of reality.

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The EASST conference in Lisbon, 1998

a report by Ruth Benschop
University of Maastricht, the Netherlands

The EASST conference of 1998 was set in beautiful Lisbon. It was a well-organized event, in which only very occasionally one ended up in a session which turned out to have been reorganized at the last minute to become almost unrecognizable for the audience. Long breaks and the city with its restaurants and pastelarias made it particularly easy and pleasant to catch up with old friends or to make time to talk over new plans. In this report, I will focus on a few interesting events and will try to point out some topics and questions at issue at the conference.

Looking back, it seemed that a number of people were concerned with one particular property shared by the material studied as well as by the analyses of this material: their narrative nature. Firstly, what does it matter that what we study often appears to us in narrative form? And not just any narrative. We read all kinds of stories, written for all kinds of reasons. How should we manage these reasons in the way we understand and describe the stories we use? Secondly, what does it matter that our understanding and analyses of these narratives are themselves narratives? What kind of stories do we want to write, for whom and what effect does this have - on what we can say, understand, analyze, on what we can do with our stories? It seems to me, for example, that narratives with charts, graphs and tables are making a big comeback. To say a little more about the different kind of narratives we write, the different kinds or research we do, let me take you to the conference dinner.

For a brief moment we were taken back to the long ago days of schooltrips, when we were taken to the site of the conference dinner by bus. The dinner was in a beautiful building (great bathrooms with gorgeous ceramic washbasins) with a courtyard. As I walked into the courtyard where everyone
was enjoying a pre-dinner drink and chat, I saw a lot of people I hadn't seen before. They and I had travelled different routes through the sessions and our paths had not crossed. Talking over this phenomenon with some colleagues after the conference, we concluded - rashly and not especially sophisticatedly - that there were those who had gone to "policy" sessions, and those who had gone to what were either called "French" or "story" sessions. Thus, participants seemed either to go to sessions
where graphs and tables were presented, or where complexity and plots abounded. Or more precisely, retrospectively sessions could be categorized in this way. Whereas previously, at least in my whig-historical imagination, sessions used to be organized around shared objects of study and thus would include different types of research about a similar object of study, now sessions could be discerned that shared a way of doing research (and a way of telling about this) while examining different topics. Or is it more mixed than this: that certain topics are now being studied by certain types of research? You know, policy in general, policy in particular, national policy, policy in Europe, etc. by those trying to model and predict, and orange juice, architects' cases of curiosity, and minds by those trying to historize and deconstruct? I'm not sure.

Anyway, moving along to one of the sub-plenaries, elegantly chaired by Steve Yearley, on Bodies, Cyborgs and Cultures, which was set in a room that was packed, warm and sweaty to begin with, but which became increasingly chilly as the airconditioners churned. In this session, Nigel Thrift almost managed to present two papers in the time of one, one of which was concerned with performance. It wasn't entirely clear to me whether Thrift meant performance in the sense of giving a performance, being on stage, or in the maybe more theoretical sense (trying to get away from subject/object dichotomies) of things that are always in the process of happening, occurring, becoming so, or both. (If he meant both, I wonder how the audience comes into it. If increasingly everyone is performing, or everything is being performed, who is watching?) Annemarie Mol uncharacteristically complied with what she told us was the assignment given to her by the organizers of the sub-plenary, and produced a grand narrative on bodies. Bodies performing and the performativity of bodies and to top it off there was talk of fact and fiction, and cross-fertilization of both genres: faction and..... fict? More prosaically, the university building where the conference took place was located beneath the route taken by planes arriving at Lisbon airport, which eventually resulted in curiously repetitive behaviour by the conference attenders. Upon the approaching noise of an airplane, without even looking up, those seated near an open window would push these windows shut for the duration of the noise while the speaker fell silent for a couple of seconds. This behaviour which quickly became normal and was automatically comprehensible for all participants was at issue in the session organized by John Law, Ingunn Moser and Stuart Blume. In this session, three papers focused on disability. They asked what a "good" way to study disabled people might be, what STS might have to offer to the study of disabled people, and how studying disability may put our own presuppositions at stake. Such questions can and have of course become relevant to almost all research topics, but it is interesting to note that they seem particularly pressing in the study of disability. Is it because we are also caught up in what Law & Moser see as the way in which all issues surrounding disability are framed in ethical terms? Or is it a dissatisfaction with the technique of distance and sobriety as a way of dealing with and opening up questions and topics about passionate and painful issues?

Finally, the session I participated in, Anne Beaulieu's "The Measure of Mind: Studies of Technologies in the Neurosciences" included a collection of five well matched papers. All of us described in detail practices in which minds and bodies circulated and related to one another in different ways. The juxtaposition of our different but rather closely related questions, methods and objects of interest made for an interesting although slightly cramped-for-time meeting. Alas, we were scheduled as the last session of the conference. This means that within seconds of closing the session, all participants vanish into thin air. The bustling hallways are suddenly empty and quiet, which as a presenter feels rather like having dropped a stone into a pond without water. Following the others who had left before us, we had no choice put to pack up, walk to the undergr ound through the rain and go for a vino verde in Real Fabrica. There are worse fates.

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Socio-economic Studies of Science, Technology and Innovation in Spain

by Luis Sanz-Menéndez

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The difficult aim of this paper is to describe, in few pages, the rise and development of socio-economic research on science, technology and innovation in Spain. This exercise takes the risk of missing some of the information and relevant contributors, but it will try to summarise the complexity of the situation and define the main features of the field in Spain.[1] The objective is to identify groups or people involved in the field on a permanent basis; thus, in general, authors of single contributions have been ignored.

It is no secret that this field in Spain is less developed than in other European countries. To understand this situation we should be remember how, historically, the development of the Spanish scientific and technological research activities has been low in comparison to some other European countries. Science has played a very limited role in public life, so it could be perfectly understood that this topic has attracted little attention from researchers. In fact, until the mid-eighties research, science, technology and innovation were not introduced in a relevant place in the political agenda. This created a lack of incentive to allocate resources from the social scientists to the issue.

A secondary explanatory element is the small room, in the Spanish university system, for socio-economic studies of S&T. First, the Franco dictatorship created significant constraints for the development of social science (especially Sociology and Political Sciences). Second, until the 90s, no systematic teaching was given or diploma granted (at bachelor, Master or PhD levels) in this field by any Spanish university; only some courses in the sociology of science at undergraduate level were offered. There was a scarcity of new researchers in the field, impeding its development. Thus the main supply of researchers has come from either natural science or abroad.

All these factors have made for a field of disperse efforts undertaken by individuals in different institutions. There has been no systematic effort to create research centres. Such a situation is reflected in the late arrival of specific associations and journals in the field.

Before the early eighties no significant activity in the research field, either conceptually or empirically, was carried out, with significant exceptions in some adjacent domains. Spain had a very active community in philosophy of science. In 1971 an excellent journal, *Teorema*, was launched that defined sociology of science as one of its areas of interest. It created the conditions for rapid dissemination and re-elaboration of the Kuhnian arguments on the sociology of scientific knowledge.

But in sociology, in the mid seventies, only a few isolated individuals developed activities in Sociology of Science, mostly with the central aim of disseminating the arguments and ideas of the flourishing international research. Some individuals, mostly educated in the Mertonian tradition in US, such as J. Jiménez-Blanco, M. Beltrán, P. González-Blasco, J.M. López-Piñero, or M. García-Ferrando played a role in translating the original contribution and preparing the first Spanish textbooks in the late seventies. Other people also made sporadic contributions to the literature in Spanish, however much their activity was concentrated in other domains, such E. Lamo in the area of Sociology of Knowledge. The situation also can be summed up by the fact that, in Spain, the first diploma in Sociology (by the first School of Political Sciences and Sociology) was granted in 1977.

The history of science also was an emerging discipline which didn't play any role in the Schools of History. Those who started the movement to study the history of science (and, later, the history of technology) came from the Medicine Schools, Physics Schools, etc., and were trained originally in the natural sciences.an original training in natural science. In this domain the role of the CSIC should be mentioned. It's the biggest research institution in the country that, in its actual Centre for Historical Studies, gave support to the development of History of Science research, with people like J.L. Peset or A. Lafuente. In fact, it was in December 1978, when the First Congress of the Spanish Society on History of Science was held in Madrid, chaired by S. Garma. This focus was renewed later, with contributions in history of science from the Autonomous University of Madrid (J.M. Sánchez-Ron or J. Ordoñez) and in economic history of technology (S. López at the University of Salamanca).

A second group, very important because of its significant internationalisation, emerged at the CSIC documentation center (CINDOC). Their focus was mainly on "measuring" science through bibliometrics. The group was created with researchers mainly from the natural sciences (as Aida Méndez, Isabel Gómez-Caridad, M.T. Fernández, etc). In addition to their research in Spanish scientific production, this group also has played a very relevant role in diffusing the bibliometric activities at national level. They edited the journal *Revista Española de Documentación Científica*.. The group had continued its growth in the nineties with new researchers as María Bordons. They also had play a role in the diffusion of bibliometric studies, influencing other universities such as Granada (E. Jiménez-Contreras) or Carlos III of Madrid (E. Sanz).

As in many other countries, Economics has been a basic discipline for the development of research on technology and innovation. In Spain the strongest tradition emerged in the mid-seventies at the Complutense University of Madrid (with J. Molero, M. Buesa, C. Martín or L. Rodríguez-Romero), the latter two having worked through eighties at the influential Fundación Empresa Pública, making a significant contribution to the study of technology as a productive factor. The former two, Molero and Buesa, have continued working to the present at the Institute of Industrial and Financial Analysis of the Complutense University. The influence of some economists from SPRU should be taken seriously to understand the themes (technology and MNCs, etc.) of attention of these researchers. Some other individual researchers emerged in the Autonomous University of Madrid (as Paloma Sanchez) or in Oviedo (as F. Lobo or Z. Fernández)

Engineers also have contributed since the early days to the socio-economic analysis of technology and innovation, such as J. Pavón or J.R. Figuera at the Technical University of Madrid, or P. Escorsa and F. Solé-Parellada at the technical University of Barcelona. For more than a decade Engineers (such us F. Ros, M. Gamella, etc) also have been responsible for FUNDESCO, a significant contribution to the social study of communication and new technologies.

The external environment of research changed in mid-eighties. The attention to STI issues has grown in relation to increased interest in public policy S&T. When the socialist government came into office S&T entered the policy agenda. The attraction of public attention to S&T transformed the context of development of the field, because it created significant opportunities for academic entrepreneurs in the development of the field.

Some people educated in Philosophy Schools have played a relevant role in disseminating the STS and SSS debates. A group based in Valencia and Barcelona played a role in the preparation of textbooks for high schools; INVESCIT was a group including J. Sanmartín and M. Medina, later J.L. Luján, or J.L.López-Cerezo, and others. Reflections on technology assessment had been one of their main lines of action. Other philosophers at the CSIC Institute of Philosophy, such J. Echevarría or J. Mosterín, have been also active.

Unfortunately disciplinary research in Sociology in Spain had made marginal contributions to the production of new knowledge in this field. The dominant strategy of lecturers and researchers educated in Spain had been one of acting as translators of papers and the debates between the international sociological schools, with very little empirical research. Between them individuals based in different Universities such E. Medina, T. González de la Fe, C. Torres, J.M. Iranzo or R. Blanco played a role in making some texts available in Spanish. Two individual exceptions are the the Vasc Country University group created by M. Olazarán, trained at Edinburgh, on social shaping of science, and the activities of R. Pardo al the Fundación BBV on public perception of science.

A different case is represented by Manuel Castells's contribution to the analysis of new technologies. Between 1985 and 1990, the newly created Institute for the Sociology of New Technologies at the Autonomous University of Madrid was a key research centre. But today after Castells left the University to join the

CSIC it has almost disappeared from the map.

The development of S&T policies in Spain also has played a significant role, not only because the favourable environment created, but also due to the fact that a couple of key politicians and policy makers in mid-eighties after finishing office started to promote and develop direct research, an interest they had while in the Parliament or Government.

A very significant case is M A. Quintanilla, senator, Chair of the Parliamentary Commission for S&T, and advocate of the technology assessment activities at the Spanish Parliament. After he quit the Parliament he returned to his chair of Philosophy at the University of Salamanca and mobilised a group of research called EPOC (Evaluation of Science Policies). The report produced by the Commission, evaluating new S&T policy in 1990 served as a base to create that group, now is running a Masters Course in "Communication and Science".

The second case is Emilio Muñoz, biochemist by training, key policy actor and one of the entrepreneurs that promoted the reforms of the S&T system when the socialists came into office. Muñoz, who had been Director-General of Science Policy, General Secretary of National R&D Plan and President of the CSIC (National Research Centre), made some analytical contributions while at office. But when he returned to a regular research position, he requested to be transfered to the CSIC Institute for Advanced Social Studies (IESA Madrid), where, jointly with Luis Sanz-Menéndez a sociologist and political scientist, created RUSTEP - "Research Unit on Science and Technology Policy". Since its creation it has grown through its involvement in international research projects on S&T policy and research systems dynamics.

There are some other cases of individuals, with no previous records in S&T studies, who during (as L. Oro) or after (as I. Fernández de Lucio, A. Modrego, J. Sebastián or J. López-Facal) their stay in office made some contribution to science policy at national level. Also a Union group from Comisiones Obreras (A. Duran, E. Criado, etc) from the 'May 1st Foundation' have done some analysis in this field.

In Spain the field of economics and busines administration is still the main supplier of research in science, technology and innovation studies. Additional groups have consolidated in the University Carlos III of Madrid (with Zulima Fernández, Clara E. Garcia, etc.), the Autonomous University of Madrid (with P. Sánchez, P. Morcillo, A. Cadenas), the University of Santiago (X. Vence), the Autonomous University of Barcelona (D. Pérez, I. Busom, etc), and even at the CSIC Institute of Economy and Geography (R. Rama, etc.). However, in the last years some other individuals have entered the Spanish map from different areas, as the sociologist J. Bellavista, trained at PREST, or the political scientists X. Ballart and J. Subirats in Barcelona, or people living in other countries, like J. Molas-Gallart in UK or S. Borras in Denmark.

The precariousness of the research area is reflected in the fact that there is not a specific journal, though *Arbor*, directed by M.A. Quintanilla, has played the relevant role of becoming one place for exchange of contributions in the field. Since the early nineties new Master degrees and attempts of developing PhD courses in Madrid, Salamanca, Barcelona, Valencia, Sevilla, etc. in science, technology and innovation studies have increased the supply of people entering the field.

RICTES, a professional association, has been an interesting experience, conceived while four of the significant reseachers in the field (in different disciplines) were participating in the 25th Anniversary of SPRU (Molero, Quintanilla, Sánchez and Sanz-Menéndez). RICTES started as a soft attempt to develop the field in collaboration with the organisation of the First Spanish Workshop in September 1992. Since then RICTES has become a formal Association and has organised four Conferences which have allowed the people from different disciplines to develop communication and convergence.

At present there are two main challenges for the field in Spain: the strong internationalisation and Europeanisation trend in Spanish research groups, and the consolidation of the trans-disciplinary research efforts developed in the previous years at the national level.

NOTE

1. For a list of references and address of some people mentioned here, see: M. Olazarán and M. Moso (1998): "Social Studies of Science and Technology in Spain", in Knut Sorensen (ed.) *Similar Concerns, Different Styles? Technology Studies in Western Europe - Part 2*, Brussels: CEC-COST-A4 Series, 1998; or those included in the, for Spain very incomplete, *The European Guide of Science, technology an Innovation Studies (P. Wouters, J. Annerstedt & L. Leydesdorff)* at hhttp://www.chem.nl/sts/guide/draftguide4_ct.html

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EASST COUNCIL ELECTIONS 1998

CANDIDATE BIOGRAPHIES AND STATEMENTS

BALLOT FORM

Please return before January 20, 1999

CANDIDATE BIOGRAPHIES AND STATEMENTS

PETRA AHRWEILER

Biographical Note

Petra Ahrweiler is a sociologist working as a research fellow at the Institute for Science and Technology Studies, University of Bielefeld. After finishing her dissertation thesis on artificial intelligence research in Germany (Free University of Berlin, 1993), she became interested in the theory of complex systems and the application of computer simulations trying to connect both with STS research problems. In Bielefeld, she manages the project "Computer Simulations in Science and Technology Studies" and has co-edited (together with Nigel Gilbert) a book with the same title. Her habilitation project is equally concerned with a simulation approach both for theory and community formation processes in science. Besides this methodological focus, her main topics are innovation networks and science policy evaluation. Here, she is involved in two EU projects of the TSER program: firstly, she was one of the proposers of "The Self-Organization of the European Information Society" for the part which investigates the European RTD policies on a European and on various national levels working out policy options in a knowledge-based economy. Secondly, she just begins to conduct her own research work in the project "Simulating self-organizing Innovation Networks" following the approach to simulate the networks of science-government-industry relations.

Statement

EASST is the European association of the STS researchers. In contrast with other global, national or local STS associations the question arises whether this means anything but an accidental territorial or political criterion for membership. Is there a special shaping of European STS? If yes, how does it look like? One of the Mertonian norms pleads for universalism in science, there was and is an intense critique concerning the Eurocentric patterns of societal modernization processes and their scientific reflection- is there any need for a special European STS perspective? In my opinion, EASST should develop a more distinguished profile within the landscape of existing STS associations which could go hand in hand with its achieved openness for global developments and problems. Especially STS should not sell itself to political or economic needs, but should equally not neglect important changes in society which demand attention. In this phase of "building up the house of Europe" various related research topics come into view which require STS research work and which should become an issue on the organizational agenda of the association. For example, the currently observed regional diversity in science and technology development gives rise to a need for compensation, allocation, and equalizing effects expressing itself through reflections on networked knowledge and technology production. Thus, as far as an integrated European science and technology innovation system will emerge, EASST can try to contribute to these integration processes. I would care for developing such a perspective and for implementing it in EASST conferences, symposia, publications, etc.

ROLAND BAL

Biographical Note

Roland Bal is a lecturer at the Department of Technology and Society Studies at Maastricht University. He received his degree in Health Sciences at Maastricht University in 1991 and completed the Netherlands Graduate School in Science, Technology and Society in 1994. He worked for five years at the Leiden Institute for Law & Public Policy - first as a PhD student and later as a research associate - and hopes to receive his PhD-at Twente University coming January. His research interests include the regulation of (chemical) risk; science and public

policy; science, technology and the law; issues of (European) internationalization; and the changing welfare state. He is co-editor (with Willem Halffman) of *The Politics of Chemical Risk: Scenarios for a Regulatory Future* (Kluwer 1998) as well a of several reports from contract research and published articles in journals in the STS-field as well as in the fields of law, and labor conditions.

Statement

It has almost become a cliché to state that there is a need for STS to 'reach out'. Although I endorse the cliché - because the field has to able to accommodate the growing number of PhD's, because it might strengthen our own analyses and because STS has something to add to the activities of others, whether those others are policy institutions, industry or other social movements - I feel that there is something at risk here too. This was especially apparent during the Lisbon-conference where there seemed to be a strict divide between those of us that study policy issues, and those who do not, even up to the point that different labels are attached to these different studies (STS and ST Innovation). I think there is a need for EASST to tackle this risk, for example through the organization of cross-cutting, thematic workshops and the like. Of course there are other boundaries to cross as well, such as between the Northern, Southern and Eastern members, and activities that EASST has set up in the past along these lines should be continued and where possible enhanced.

NIGEL GILBERT

Biographical Note

Nigel Gilbert obtained his PhD in the sociology of scientific knowledge in 1976 with a study of the growth and decline of scientific specialties. He then co-wrote *Opening Pandora's Box: a Sociological Analysis of Scientists' Discourse* with Michael Mulkay. In the 80s, his interest turned to the interaction between the social sciences and information technology and he was involved in several very large technologically based projects. In the 90s, he has had three main interests: science policy in Europe; the politics of local environmental issues; and the use of computer simulation as a method of theoretical analysis in sociology. He is the author or editor of 14 books and about 120 papers. He is involved in the UK Government's Foresight Programme and with the UK Economic and Social Research Council.

Statement

If elected, my main concern would be to raise the visibility of studies of science and technology policy throughout Europe, through encouraging and supporting scholarly interchange between academics and policy-makers. EASST is uniquely positioned to achieve this and has already done much, but more is needed.

MERLE JACOB

Biographical Note

Merle Jacob is a research fellow at the Department of Theory of Science and Research, Göteborg University, Sweden. Ms Jacob's main research area is science and public policy with particular emphasis on environmental policy and issues related to the transformation of the university and their implications for science policy.

Statement

If elected to Council, I would dedicate my term of office to achieving the following objectives:
1. Stimulate greater interest among members for raising the public profile of EASST within Europe through participation in public debates about science and science policy.
2. Work towards improving the global reach of STS through emphasizing the relevance of themes and issues related to the development of science and technology in the Third World

JUDITH MOSONI-FRIED

Biographical Note

Judith Mosoni-Fried is an economist, graduated from the Budapest University of Economics. Her research is on S&T policy and innovation. She is senior research associate and deputy director at the Institute for Research Organization of the Hungarian Academy of Sciences. She also works as an expert with different government organizations in Hungary and with NGOs in Hungary and abroad. Her recent studies are focused on foreign direct investment in CEECs as well as on the conditions for sustainable economic growth in the Central East European region.

Statement

I think that EASST has been doing a lot for bridging the communication gap among individuals active in S&T studies. This goal is mainly achieved by the general conferences and other meetings, the success of which depends on the Council's work to a great extent. In this context I would suggest a very strict and effective preparatory and follow-up work. Some concentration of topics and/or selection of one main subject for each conference is needed. The contributions of the invited "guest" subject should be published as an EASST publication. Living in a Central European Country, I do not forget that EASST has been the first international organization in our field, which had done the most for the integration of CEECs to the European network. It was and still is of extraordinary great significance. I'd like to enhance an even more active participation of this region in each kind of work covered by EASST.

GENNADY NESVETAILOV

Biographical Note

Gennady Nesvetalov was born in 1939 in Russia. After graduating in 1962 from a ship-building institute in the Ukraine, he worked as an engineer in Saint Petersburg and, since 1966, he has been working in Minsk at the Academy of the Sciences His professional interests are connected to Science and Technology Studies. He holds a candidate of sciences degree in engineering (Moscow Mining Institute, 1970) and a doctor of sciences degree in sociology (1990). He is the head of the Sociology of Science Department at the Institute of Sociology of National Academy of Sciences of Belarus. During the last decade he has carried studies of ST transformation in post-communist countries. He participated in the Network of Transformation of Central and Eastern European Countries Science Systems (1993-1996), a project on brain drain from NIS (INTAS), a project on the mobility of R&D personnel under conversion (TACIS ACE) .

Statement

As a representative of STS in the countries of the former Soviet Union, I anticipate I could establish more links with European republics of the FSU (Azerbaidjan, Armenia, Georgia, Moldova), could engage in comparative studies after 10 years of ST transition and could contribute to issues of R&D personnel policy and international scientific cooperation.

ANN RUDINOW SÆTNAN

Biographical Note

Ann Rudinow Saetnan received her doctorate in Sociology from the University of Trondheim, Norway (UNIT, since renamed to Norwegian University of Science and Technology --NTNU) in 1995. Since 1987 she has been employed variously as a research fellow, post doc, assistant professor and associate professor, at the Centre for technology and society (STS), the Department of Sociology and Political Science, and the Department of Social Work at the UNIT/NTNU. Prior to that, she was employed as researcher at the Norwegian Institute for Hospital Research. Her research has focused on medical technology and knowledge, working conditions, lay end user perspectives, and gender. She is currently editing, together with Nelly Oudshoorn and Marta Kirejczyk, a volume on user roles in the cultural appropriation of

reproductive technologies (Sætnan, Oudshoorn & Kirejczyk (eds.): *Localizing and Globalizing Reproductive Technologies*, forthcoming at Ohio State University Press).

Statement

When I embarked on my doctoral project, I was a member of a number of potentially relevant professional societies, such as the International Sociological Association and the International Society for Technology Assessment in Health Care. EASST, and its "sibling" society 4S, were new acquaintances - new and substantially more congenial and inspiring. What struck me as especially congenial and inspiring about them was their high degree of interdisciplinarity and inclusivity, their low degree of cliquishness and hierarchical exclusivity. Should I be elected to the EASST council, I would strive to maintain such an environment - one where new graduate students engage in lively debate with established senior researchers, and where people pursuing diverse directions of SST research show a mutual interest in one another's work. I would also like to contribute to council efforts at raising awareness of the SST field among research and technology policy makers nationally and internationally.

JANE SUMMERTON

Biographical note

Jane Summerton is Associate Professor and Docent at the Department of Technology & Social Change of Linköping University, Sweden. A sociologist by original training, she received a Ph.D. in technology and social change (1992) and is currently a co-leader for a research group entitled "Technology, Practice and Gender" in Linköping. She has also recently concluded two years as Director of Graduate Studies and Director of Social Science for a newly established multidisciplinary (engineering and social sciences) graduate school and research program for energy and environmental studies in Sweden. Her research interests are within the sociology and contemporary history of technology (critical managerial strategies, sociotechnical networks and systems, arena theory), particularly with regard to energy and environmental issues. She is a contributing editor to *Science, Technology and Human Values*, a member of the editorial boards of *Technology Studies, Journal of Urban Technology,* and *FLUX*, and an active member of the Network of European Centers for STS, NECSTS. Currently (fall term 1998) she is a Visiting Professor at the University of California at Berkeley, where she is co-teaching a university-wide advanced graduate
seminar on selected areas of STS.

Statement

I believe that one important role for EASST is to increase its efforts to support and stimulate graduate students and younger scholars who enter or consider entering our field(s). While organizing conferences and workshops where new or tentative work can be discussed is clearly part of this role, other means of active support should be developed. For example, EASST could work to develop opportunities for informal "open door" graduate exchanges between departments in our network, as well as publicize information on courses offered in the various departments which would be of interest to graduate students at other departments - but which are not offered by the "home" department. Perhaps a grad student work group could even be formed to initiate e.g. small thematic workshops and/or adhoc research groups for graduate students, as well as make policy suggestions to the EASST council as to ways to encourage emergent scholars. Such initiatives might not only strengthen the professional links between researchers and groups in various parts of Europe, they would enable enhanced resource-sharing while also encouraging the "fresh blood" that provides ever-needed renewal within our field(s). Along these lines for example, I initiated a few years ago an informal network of ten STS-related departments in the Nordic countries, in which simple measures have facilitated graduate students' participation in activities (courses, seminars, guest lectures etc.) at other STS centers.

ANDREW WEBSTER

Biographical Note

Andrew Webster studied sociology at South Bank University and took his PhD in the sociology of science at York University. Since 1978 he has been based at the Department of Sociology at Anglia University in Cambridge, UK, where he is currently Professor in the Sociology of Science and Technology . In 1988 he established the Science and Technology Studies Unit (SATSU) which now has 10 staff and core research activities in the areas of the sociology of science and technology policy, the cultural dynamics of technological change and health sector research (especially the impact of new health technologies). He has published papers in these areas and books including *Science, Technology and Society: New Directions*, most recently co-edited *Capitalising Knowledge* and he is co-author of the forthcoming book *Valuing Technology*. He is currently co-ordinating a TSER project, is on the board of a number journals and a member of the ESRC's International Policy and Research Evaluation Committees in the UK.

Statement

In recent years EASST has consolidated its position as the principal scholarly association within the science and technology studies field in Europe. If elected I would hope to build on its activities in a number of ways: work towards establishing EASST as a professional association recognized at country-specific and pan-European levels; seek to foster members' research interests through the new opportunities that the EU's Fifth Framework Programme promises for STS and science policy; help encourage smaller STS groupings through better networking, exchange, and organizational and intellectual support where appropriate; increase the visibility and utility of SST within political circles.

STEVEN YEARLEY

Biographical Note

Like many colleagues in S&TS, I began my training in the natural sciences, switching to social science during my undergraduate degree. I then completed my doctorate on the sociology of argumentation within the earth sciences under Professor Mike Mulkay. After the usual string of short-term jobs, I was appointed to a sociology lectureship in Belfast where I worked for around twelve years. During that time I also spent two semesters working away, once in Dublin (in the sociology department at Trinity) and once in Cornell (in the S&TS Department).

Until the mid-1980s my interests were primarily in the sociology of knowledge and the sociology of the basic science community. In Belfast, I developed two new kinds of academic interest. First, I became interested in the politics of Irish science and in the sociology of the scientific community in Ireland. The research I did on this topic led me to a parallel interest in what science studies has to say about science in the smaller and in various ways peripheral European states (and 'almost-states' such as Scotland). Second, I became interested in the role of scientific skills and scientific arguments in environmental debates and in the ecological movement. I carried out case-study analysis of several environmental NGOs and studied the internationalization of environmental campaigning. This work also overlapped closely with the emerging theme of the 'public understanding of science' (PUS) and I have continued to look at public environmental disputes and public assessments of policy knowledge as a key site for studying PUS.

Three years ago I returned to England, to take up the chair in sociology at the University of York. Since arriving in York I have attempted to maintain research interests in these three areas: the sociology of scientific knowledge, social scientific studies of the environment (including elements of PUS), and science at the European periphery; indicative publications include the essay 'Epistemological chicken' (1992) which I co-authored with Harry Collins and my most recent books (*The Green Case* and *Sociology, Environmentalism, Globalization*). I have also

continued to involve myself in the discipline, for example, serving on the editorial board of *Social Studies of Science* and acting until earlier this year as book reviews editor for *Science, Technology and Human Values*. In specific relation to EASST, I have been a member since its first year of existence and served on the programme committee of the 1998 conference in Lisbon.

Statement

As a board member I would have two principal ambitions for EASST's development: first, to raise the profile of S&TS within the broader disciplines of the social sciences, particularly in relation to social theory. Exponents of S&TS have made major contributions to the study of expertise, of power, of the social regulation of risk, of the construction of gender, of the theory of action, and of the sociology of machines. My hope is that EASST members should devise ways of promoting dialogue with other social scientists and policy analysts to increase the intellectual and cultural influence of S&TS.

Second, as I have experience of a number of EU research programmes, my ambition is that EASST should press for the importance of S&TS research to the development of knowledge about European culture, politics and social change, and for recognition of the policy relevance of S&TS work. At the same time, the growth of a European (or EU) culture of expertise (as national systems of expertise are juxtaposed and combined) is a key emerging topic for S&TS analysis. I would like to sees EASST's claims strongly pressed at European institutions, and would aim to encourage research, meetings and publications on S&TS in and about Europe.

BALLOT
EASST COUNCIL ELECTIONS 1998

Please vote for FIVE of the following candidates:

_____ Petra Ahrweiler
_____ Roland Bal
_____ Nigel Gilbert
_____ Merle Jacob
_____ Judith Mosoni Fried
_____ Gennady Nesvetailov
_____ Ann Rudinow Saetnan
_____ Jane Summerton
_____ Andrew Webster
_____ Steven Yearley

Return your ballot before January 20, 1999 to:

EASST Secretary
Department of Science and Technology Dynamics
University of Amsterdam
Nieuwe Achtergracht 166
1018WV Amsterdam
NETHERLANDS
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REDES and the Building of a Latin American Tradition in STS Studies

by Pablo Kreimer

REDES *(Review of Social Studies in Science),* or *NETWORKS* as the Spanish acronym means, has been published in Buenos Aires, Argentina since 1994 by a group based at the University of Quilmes. The history of the publication is comprehended between from the cross between two sets of problems: on the one hand, the degree of development and the characteristics of the specific field of STS in Latin America; and on the other, innovations arising since the review was set up.

A contextual factor with profound implications for the progress of science in Latin America is the fact that we are faced with symbolic and material spaces of production which present significant variations from the same processes in research institutions in more advanced countries. In general, we designate these contexts as "peripheral" even when in some cases we are talking about scientific practices which may be responding successfully to the demands of the "international scientific community". With regard to this situation, some authors such as Vessuri, Cueto or Kreimer, have spoken of "scientific excellence on the periphery" or "peripheral science".

The situation in Latin America is an interesting one. Around the 1960s, a group of authors arose who were concerned about the development of science and technology in the Latin American countries (including Herrera, Sábato, Halty, Varsavsky, Sagasti, Roche, amongst others). These authors, who belonged to the so-called "Latin American school of thought in STS", did not come from the strictly academic field of the social sciences; rather, they were scientists, engineers or economists whose concerns were centred mainly on the political aspects (and policy-making) of science and technology.

Some years later at the beginning of the nineties, STS seems to have been going through a phase of "refoundation": its subject matter was redefined and a few study programmes devoted to CTS questions were set up. In other words, STS studies have been approaching a phase which, though still in its first stages, signals a new institutionalisation. In academic terms, a new agenda for research is gradually being defined. A central feature of this process is that new approaches from the sociology and history of scientific knowledge, from the political sciences, from the sociology of innovation, from the theory of networks, from the so-called "scientometry" and so on, are constantly being taken on board.

REDES made its appearance in this context: at the point of inflection of new attempts to (re)construct the CTS field, and emerging difficulties in attempts to strengthen local scientific communities, as a consequence of military governments and the economic crisis of the 1980s. Before then, there had been some publications which concerned themselves with CTS subjects, albeit only to some extent, or which were restricted to a single discipline, such as the Mexican *Quipu* in the history of science or, in a less "academic" vein, *Interciencia* (*Interscience*) in Venezuela, or *Ciencia Hoje* (*Science Today*) circulating in the scientific community in Brazil or *Ciencia Hoy* (*Science Today*) in Argentina, to mention just a few.

The first articles to be published in *REDES* were commissioned from each of the authors, and *filling out* each issue was an almost miraculous task. Afterwards, articles began to materialise on the editors' desks spontaneously, especially after the third issue. In this issue some conflicts were sparked off: the authors whose articles the referees were turning away would not accept the result of their judgements and got angry at the editors; some evaluators were unwilling to make critical judgements with *written* comments and suggestions for the authors, even when their anonymity was guaranteed, and so on. Gradually, as the authors came to recognise the review as a space which had a certain *stability*, these problems became fewer and further between; the authors in the field came to accept the rules imposed by a greater degree of professionalisation. Today each new number of *REDES* is already "closed" by

the time the previous one goes to press. This means that authors have to wait longer to see their articles published, since the "waiting list" is longer. But in the long run they are rewarded because, with a larger number of articles to choose from, the quality is raised and this in turn enhances the review's prestige and thus that of the authors appearing in it.

The role played by *REDES* in the STS field in Latin America might be summarised by drawing up a list of different mechanisms:

Attracting authors publishing abroad: The few "senior" authors active in the field used to publish their articles abroad due the lack of local space. *REDES* has drawn in these authors so that they will also be able to publish at a local level, a means of breaking away from the frequent segmentation which has brought about the situation where "the most prestigious scholars publish abroad and the least prestigious publish at home."

Attracting authors working on other topics: This has been achieved through the laying down of "broad limits" in the definition of the field, and by proposing topics that overlap with other disciplinary or thematic fields, even if they do belong in a general sense to the "CTS field".

Attracting young researchers fresh to the topic: In order to familiarise them with CTS studies and encourage specialisation in the field, this strategy has been (and continues to be) directed especially at post-graduate students and young researchers within the disciplines of the social sciences,.

Circulating works of the most senior authors in the field: As part of the review, a "dossier" has been created to disseminate Spanish texts which today may be considered as "classic" representatives of the "Latin American school of thought" in the literature of the social studies of science.

Galvanising debate by publishing provocative topics: This is an attempt to awake other researchers' interest in STS studies.

Mobilising "non academic" authors: Authors who have never belonged to the field of the social sciences have been invited to comment on articles and collaborations, especially those who are practising scientists or functionaries responsible for science and technology policies.

Publishing material of use in the training of new generations of researchers: *REDES* has always had a concern for texts whose usefulness lies in their value as tools for training future researchers in STS.

Widening the scope of the field: It is the researchers themselves who have gradually been restructuring the form and content of the review: its thematic horizons, its theoretical perspectives and its leaps in the content of the learning produced in it are in a dynamic state which is only partially due to the editors' strategies.

To a great extent, *REDES* has been operating as a contributory factor in the consolidation of the STS field over the last few years, even though its role as an articulator has been restricted by limitations of an institutional nature suffered by scientific publications within the region in their bid to achieve a suitable readership. The international diffusion of the review has thus been the consequence of informal relationships.

On the other hand, the review has operated as a real driving force in motivating researchers currently or potentially interested in these topics. This is due above all to a break away from a certain inertia in terms of their reticence to publish works in article-form – which has been the cultural trademark of researchers in past decades.

This aspect also has its counterpart in the excessive demands brought about by a pressure to publish: carrying to its logical conclusion the maxim of "publish or perish" can over-stimulate the impulse to transform thoughts into publishable segments. This tension is certainly far from being the heritage of the practitioners of CTS studies, although perhaps they may be the first to perceive it.

There still exist problems of legitimacy in evaluations: some authors are reluctant to accept critical comments and, even more so, any that are decidedly hostile to the articles they present. However, these authors would perhaps accept these, or even more aggressive, comments without much dissent if they were to come from publications with more experience and prestige behind them, particularly foreign ones.

Be that as it may, what is evident is that the socio-cognitive process at work in any research project is today possible, at least in part, as a consequence of a forum for STS topics which five years ago was non-existent.

REDES can be consulted at
www.unq.edu.ar/ricyt/redes, and at
www.latbook.com.
Articles and correspondence may be sent to
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Transition Within the Transition:
Industry as a Stimulator of Technology Transfer in Post-Socialist Countries[1]

by Karel Mueller and Henry Etzkowitz
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A scientific-technological revolution, foreseen under socialism, is becoming a reality under capitalism. Of course, this is neither Adam Smith's nor Karl Marx's capitalism but rather a non-laissez-faire version with a significant role for the state in innovation as well as macroeconomic policy-making. A more fitful transition is underway in the former socialist countries as they import organisational formats and adapt previous experience to renovate their industries. Local innovations in encouraging industry to become an active participant, rather than a passive recipient, in the innovation process need to be bench-marked.

Models from other countries to bridge the technology transfer gap between universities, research institutes and industries should be analyzed as they are inserted into local conditions. Blockages to the use of indigenous R&D capabilities in the post-socialist countries, and attempts to overcome these difficulties, need to be assessed in a comparative framework.

A series of experiments are underway in different post-socialist countries, starting from various standpoints, even given the common substrate of the former S&T model. Estonia has shifted its academy resources into the universities, selecting among scientists to emphasize the development of careers for young researchers. Bulgaria is keeping most of its academy institutes in place but shifting the balance within them from "basic" to "applied" research. In the Czech and Slovak Republics the Academies have been radically decentralized and slimmed down while the industrial research institutes became mostly subject to mass privatization. East Germany, of course, has been subsumed into the former West German system but, even so, hidden capacities and human resources from the previous era influence the future. In both Hungary and Bulgaria, a post-socialist science park model is being created, transforming former technological institutes into a network of small firms with brokering capabilities to link them to sources of contracts and market opportunities abroad.

Nevertheless, significant disjunctures between R&D providers and potential users persist from the socialist to post-socialist eras in Central and Eastern Europe and the FSU. A similar problem can be identified in the US and Western Europe. For example, the growth of central laboratories isolated from the operating divisions of firms parallels the Branch Institutes separated from production units. In this essay, we set forth the structural dilemmas that inhibit the possibilities for technology transfer, especially in the transitive countries. Next, we address the regulatory framework of technology, the technological crisis of CEE industries, and the impact of structural dependencies. Finally, we debate the potential for mobilisation of competitive opportunities and the reform of regulatory frameworks.

Contradictions Between Capabilities and Outcomes

Transition is well underway in the West but is less evident in the East. With a few notable exceptions, the R&D formats of the past are still largely in place, often subsidized by the West. In recent years, western hierarchical corporate structures have been flattened in the face of competitive pressures. There has been a corresponding shift to rely on lateral relations within and without the firm. This involves accessing R&D from other firms, universities and government laboratories as well as joint ventures in a variety of areas, including R&D. A new profession of technology transfer has emerged, with its practitioners located on both sides of the equation.

The so-called "catching up" countries of Eastern and Central Europe and the former

Soviet Union face a dilemma. They inherited highly developed human capital resources, produced by the former socialist system that often find little use in the new era. These countries experienced a mismatch between scientific and technological capabilities and industrial development during the Socialist period, when they were able to take little advantage of these resources for civilian technological innovation. Under socialism, the goal was quantitative production. Without competition there was little need to innovate and therefore only formal use was made of an extensive technological support structures in branch and academy institutes.

In the post-socialist era, these countries experienced much the same dilemma but for different reasons. Transfer of embodied technology from abroad and foreign direct investment (FDI) alike, make little use of local R&D capacities and capabilities. In the post-socialist era, enterprises that reform themselves upgrade their products and modernise their production facilities prefer the easier way of purchasing ready made "packages" of technology from abroad rather than investing in an-house R&D facility or contracting for R&D locally. They then compete on the basis of lower prices and knowledge of the local market even as foreign companies establish new production facilities or modernize existing ones, primarily relying on imported technologies.

Under such conditions, there is little need to call upon domestic science and technology resources. How to resolve this contradiction between the existence of significant local R&D resources and lack of demand for it is one of the key issues of science, technology and innovation policy in Central and Eastern Europe and the FSU. At the same time there is a strong demand for the human capital that these countries have built up, especially in software programming skills, that pulls their nationals abroad. There is a contradiction between capabilities and their utilization at home and abroad. This contradiction manifests itself in the relationship between domestic and foreign firms operating in the domestic market. The great difference in salaries between the jobs in the domestic and foreign firms has been draining qualified manpower from the domestic firms - including R&D institutes - to the jobs in the foreign firms, even though the latter mostly require lower levels of qualifications.

The Gap Between General Reform and an Effective Innovation Policy

The very capabilities that spur the developments of the advanced western countries: the accumulated scientific knowledge is the crucial sources of the technology, which in turn forms the base of economic growth and social welfare does not yet work to this end in the so-called countries in transition. The comparatively extensive science and education capacities which the transitive countries inherited from the old regime raise the issue of mobilisation of science towards the economic and political aims of reform. However, political and economic reform, by itself, does not necessarily point the way to a useful innovation strategy for the post-socialist countries.

How can the activities of the academic and industrial science institutions be harmonized? Experiments with this issue (privatisation of the industrial science in the Czech Republic, Zoltan Bay institutes in Hungary, formations of science parks etc.) suggest that the core of the issue rests with the factors of wider social environment - industry, its motivation and capabilities to innovations, and the government with its awareness, readiness and capability to identify, promote and regulate the innovative changes in the environment of competing public interests. Moreover, the post-socialist countries, having rapidly liberalized their domestic markets, have entered the world markets with their differential segmentation and globalizing trends, challenging domestic industries, governments and public opinions.

The Challenge of Transition

Technology transfer is of great importance to the renovation of industry. Since the CEE countries are changing their institutional and regulatory framework from the closed arrangement to the open (market-based and democratic) one - the role of technology transfer is conditioned by the changes in the industrial, economic and institutional environments. The potential utilization of "the push effects" depends on creating a pull from the economic and social environment.

Only in the environment of a responsive and effective pull environment, including both the (top-down) regulatory measures and the effective bottom-up responses of market and democratic institutions can push effects can be utilized. The weakness of the responsive institutional measures of the CEE countries may call forth economic and socio-political threats. For these

reasons well-framed regulatory measures are of great importance. These include identifying push effects such as opportunities for foreign technology and capital transfer, the economic impact of the domestic industrial structures and actors and promoting pull effects such as opportunities for the mobilisation of domestic industries and economic actors towards an acceptable industrial policy.

The tensions between nationally based institutions and globalizing trends with respect to technology and capital push do not only concern the transitive economies or any other late comers from the periphery of the world economic systems. They represent a global problem of modern societies. The experience of the advanced countries, even if they enjoy the advantages of the evolutionary development of democracy suggests that institutional changes are inherent features of all societies in the environment of the radicalised modernity. Thus, the functions of economic institutions, even if they are self evident, are subject to continual re-consideration and re-construction.

There has been a shift from linear to reverse linear models and dual complementary modes. For long time in the post-war period the general industrial trend was accepted that the main resource of technology is derived from the sciences. Later, attention was paid to the alternative concepts of technology which stressed that resources of technology are shaped in its interaction to economy, social structure and culture. Economists are aware of this issue from the debates about science push versus market pull. Similar cycles of debates followed after the great industrial breakthroughs, when some blocs of scientific knowledge found wider industrial applications, or the actors of the radicalized social upheavals and disturbances expected quick scientific solutions, or technological fixes for pressing social tensions.

Technology and its regulatory framework

The science and technology interaction in the advanced nations may be instructive for the CEE countries. This experience suggests that the transition and its various competitive/cooperative, private/public forms, have not been the outcome of an internal or formal shifts only but are greatly dependent upon a meta cultural (civilisation related) discursive background. The difference between episteme (know why) and techne (know how) is embedded in the modern (western) valuation pattern. Therefore, the question "either science or technology" (push or pull) should be abandoned and replaced by the issue - "science and technology", or more specifically "what way and form of mediation between them can be feasible and prospective".

Moreover, a meta-issue is always present in debates about S&T: is technology transfer (TT) a good or bad thing? While in the traditional approach the diffusion of the outcome was understood as the doubtless mean of progress, the present approach submits technology to democratic debate. In this way the ideological debate about good or bad technology is transferred into the more specific level of the discussion and assessment of the social impacts of technology, and the ways to orient it to meet social and human needs.

The formation of a modern regulatory S&T system, including the self- regulation of science, economic and social embedding of technology, and direct or indirect promotion of their active relationship - has followed a learning (evolutionary) path in the advanced western countries. First, at the end of the 60s, after the limits of economic growth were identified (together with pressure of the oil crisis), a response was sought in the internal developments of technology by experts through technological forecasting.

The limits of this approach was soon recognized and attention turned to the assessment of the social impacts of technology (TA). TA practices helped avoid negative social consequences of technology, improve the orientation of technology actors, raise public insight into the issues of technology. The need for better insight into the growth and socio-cultural embedding of technology, its internal developments, seems to be emerging as the most pressing issue. New forms and ways for its promotion are searched for, like the practices of technology foresight, parliamentary ethical commissions, international governmental and non-governmental conferences on global problems.

The autonomy of S&T institutions has been re-shaped. The above learning process has resulted in the development of regulatory techniques and forms for the public control of technology has followed a specific route and stages. First, the experts learnt to transcend their specialized fields and identify internal opportunities of technology. Next, TA practices helped establish interaction between the experts and lay public since the socio-economic impacts couldn't be arrived at merely by better communication

among the experts. Ideally, foresight is based on the responsiveness of the experts to social issues and the better insight of the lay public into S&T affairs. Such experiences have led not only to the improvement of regulatory practices but also affected the S&T institutions - academic research and education, competitive market practices and their public regulation, the coordinate capacities of ministries and administrative bodies.

Technology transfer and institutional gaps

Taking into account the above S&T institutional framework the issues of technology transfer in the CEE countries should be assessed by both the level of technology and the institutional & regulatory framework, and its gaps to the advanced countries. In the general terms the former issue can be indicated e.g., by the fact that the factor productivity is at the level of 30-50% of the advanced countries, and the latter one by the fact of the prevailing vertical and top-down relations (and weak horizontal and bottom-up ones). This regulatory environment constrained not only the emergence, diffusion and economic impact of innovations, as already mentioned above, but also the cultivation of the interfaces among the S&T actors (disciplines), their awarness of social issues as well as the public awareness of S&T role which are so important for the identification and social control of negative and risky impacts of technology. The existing lags in the level of technology and the institutional capacities influence the transformative efforts as structural barriers and constrain the intended changes.

Of course, the technological and institutional situation is differentiated by country and manufacturing branch related factors. There are competitive manufacturing branches and product groups with minimum technology lags, or lags which can be overcome by modest resources. Also regulatory practices and their coordinative capacities as well as the responsive, or stimulative, bottom-up activities have different levels of organising, learning and communicative capacities.

The search for a regulatory framework to promote TT is affected by both types of lags, and the threats that (i) the technological lag will be "fixed" by the inefficient institutional framework (pull of industrial path dependency) or (ii) that the transformative ambitions (in the rapid change of institutions) do not positively affect the industrial restructuration and are losing a support in the corresponding technological shifts (what is felt, for example, in the Czech situation due to the mass privatisation). The awareness of both threats and search for regulatory measures which would constrain the growth of the industrial branches with low value added content (even if with a short term returns on the base of comparative advantage in low social costs) and promote (post-) industrial branches with higher value added content seem to be a proper guiding framework for the promotion and regulation of TT.

Opportunities for industrial reconstruction

The reflection of the role of TT and its problems in the CEE countries is influenced by the experience with its most powerful channels: (i) foreign capital transfers, and (ii) mobilisation of the domestic S&T resources towards the industrial recovery. The former issue is related to the problems of the monetary and legal stability and the effective stimulations of the foreign investors since the recovery of the domestic industry is constrained by the lack of capital. The latter issue and its problems are seen in the inadequate assessment, regulation and funding of this or that element of the chain from the academy to the industry, even if more profound reasons may rest with inadequate balancing of the emerging private business sector and the public sector which is transformed from the etatistic to more democratic environment.

The CEE countries - in their efforts to join the EU countries - lack some structural and institutional capacities to promote technological development and control its impact. Of course, the experience of the advanced countries can not be taken as the guideline for action since the CEE countries are challenged by different institutional environment: they have to change the basic institutional framework, and to mobilise S&T in favour of their industrial modernisation at the same time while the advanced countries merely have to deal with "fine tuning" of regulatory issues rather than putting an entire system into place.

Western experience should be adapted at the level of the structural framework. The questions of which type of regulatory measures should be promoted, which should be avoided and what risks are bound with the promotion of this or that institutional arrangement etc. should be addressed. What can be learnt from the common experience is the fact that the de-etatisation, privatisation and formation of the democratic public sector are important but not sufficient conditions for the promotion and control of S&T.

So far, the role and the impact of the foreign TT is mostly limited to narrow scope of technology and the locality of its application. Foreign production capacities are transferred to a production site or some domestic companies sub-contract production for foreign companies. S&T actors are seldom mobilised to introduce domestic industries into international technological networks. Nevertheless, there are hopeful signs such as the emergence of consulting firms to assist local enterprises, building upon informal relations among institutional sectors during the Socialist era.

On the other hand, domestic TT has thus far been constrained by the traditional institutional setting i.e. concentration of scientists in universities and Academies and weak capacities in industrial science. The traditional approach to technology has been as applied science rather than recognizing its direct industrial role. Weak administrative and regulatory experience in the coordinating S&T institutions is also a problem. Domestic TT is diffused, weak in the innovative role of industries and lacking in orientation to prospective technological trajectories.

Finding creative ways to utilize exisitng resources, such as by transforming R&D institutions into a network of filial firms rather than discarding them wholesale, is the first step of a sensitive S&T policy. The next step of how to stimulate local and foreign industry to access these actual and potential resources is the fundamental issue of this conference and of CEE S&T and innovation policy.

NOTE

1. Theme paper for the NATO Advanced Research Workshop (ARW) on *Industry As A Stimulator of Technology Transfer*, which will be held 18-20 March at the University of Bialystock, Bialystock, Poland..

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Journal Announcement

Interdisciplinary Science Reviews was founded in 1976 as a non-specialist quarterly journal devoted to interdisciplinary approaches in the physical, biological and social sciences. As well as detailed critical reviews, it features a wide ranging book review section and short 'comments' on topical subjects. Subjects covered in recent issues include: 'What is hypnosis?', 'War - some psychological causes and effects', 'The natural history of salicylic acid', 'Evolutionary aesthetics', 'Harwell - the first 50 years', 'Lucidity and science'.

ISR has a particular concern with influences of scientific and technological developments on society, and vice versa, and the December 1998 issue contains an extended dialogue between Steve Fuller (Professor of Sociology, University of Durham, UK) and Tony Barnett (Emeritus Professor of Zoology, Australian National University) on the themes considered in Fuller's recent book, 'Science'. The discussion is notable for going beyond the point scoring characteristic of the 'science wars', and the protagonists get close to agreement in some key areas.

To request a free copy of the December 1998 issue, please contact Howard Cattermole at The Institute of Materials, 1 Carlton House Terrace, London SW1Y 5DB, UK, tel. +44 (0) 171 451 7333, fax +44 (0) 171 451 2289, email howard_cattermole@materials.org.uk.

Whither Public Participation in Technology?

by Richard Rogers

A Report on "The Cultural Politics of Sustainable Technology Development: European Experiences" at newMetropolis, Amsterdam, 3 December 1998, the conference sponsored by the European Commission.

Not since the 1970s has 'public participation' in technology development been discussed as warmly and experimented upon as fervently than at present. Whereas a goodly portion of the '70s-style participation assumed the form of no-nukes-style direct action and frustrating public enquiries, with minor embellishments and delays to projects often being the notable achievements, the '90s have witnessed a conspicuous willingness on the parts of government, at least in northern Europe, to involve the public not merely in amending ex post but in *conceiving* new projects. Indeed, in the Netherlands and increasingly elsewhere, governments are rushing to implement new participatory experiments and techniques, in order to raise the political legitimacy and economic viability of new, state-sponsored or at least state-endorsed projects, large and small. Along the way they're hoping to gain a helping hand from creative, participating publics, ultimately shifting some sense of responsibility for the projects from the governmental experts to the publics.

Hence it appeared an auspicious time for discussing the value and, perhaps, effectiveness of all the new experiments and techniques, as was the stated aim of the recent conference at newMetropolis, Amsterdam's Science & Technology Center. The three broad questions put to public participation researchers and practitioners were as follows. First, why public participation and still more public participation? As Andrew Jamison pointed out, in the '70s and '80s, alternative technology movements were victims of their own success; long march-style, the vocal went into business, government and academia, incorporating insights from the meeting houses and the streets into instutionalised thought and action. Isn't that civil spirit constructively being built into new governmental technology policy today? Departing from Mumford's '64 distinction, Jamison argued, contrariwise, that in the past institutionalisation of the 'democratic ambition' only has led to more authoritarian-style managerialism.[1] As ever, public participation leads a fragile existence. If history be a guide, the participation projects will fade with the waning of funding, and the balance between the democratic and the authoritarian will tip towards the latter.

Secondly, where does public participation lead? Johan Schot, the constructive technology assessment theorist and conference co-organiser with yours truly, argued that the new experiments - Danish and British consensus conferences, European-wide Agenda 21 activities (inspired by Rio), German planning cells as well as Dutch public debates, infralabs, open planning procedures, and more - create a space for the public to influence technological change with government and industry, by commonly acknowledging and anticipating long-term impacts, and feeding that anticipation back in the design of the technologies. When 'technology policy meets the public' there is also the prospect for 'collective value learning' between policy-makers, planners, technologists and publics.[2] Thus public participation in theory would lead to two tangible results - 'better' socio-technical outcomes through shared design processes, and (as Jamison also argued) better forms of collaborations and networks responsible for making new technologies. Such networks would aid in sustaining the fragile existence of democratic technics.

Thirdly, and more specifically, under just which conditions does public participation produce qualitatively better decision-making and projects? Here the empirical work from researchers and practictioners (either independent or sponsored by the European Commission) was queried. Philip Vergragt (of TU Delft), Maarten Hajer (of the University of Amsterdam) and Wolfgang Krohn (of the University of Bielefeld) first reported on their scholarly empirical work. Thereafter a number of public participation practitioners and

technicians from the Netherlands came forward with word from the field. Having been reminded (by the work of Per Osby, available in the conference reader) that the public co-created the car culture and public involvement may only imply more cars and space consumption and less sustainable futures, one long-standing question concerned whether participation may only make matters worse, a point often made by project developers and contested by certain publics and participation proponents, sometimes with prejudice and little tangible experience to go on from either side. In other words, does more democracy lead to more sustainability? Other questions related to the authenticity as well as efficacy of participation. Has public participation been merely a guise behind which committee-room governance continues to operate (with an example being high-rise housing, effected by consortia of local governments and construction companies in '60s U.K., as Michael Thompson, with John Adams, related in the film viewed later in the afternoon). Finally, to answer the question about genuineness, do participatory procedures substantially influence official decision-making? Even if they do not currently have much of an impact, is a culture and spirit of participation being created, with knock-on effects for official policy-making down the line? Finally, are there instances when public participation should not be encouraged, owing, say, to a democratic overload? As Hans Harbers related, is the attention accorded to public participation the consequence of poor expertise on the part of government officials? Put more cynically, why else would government outsource creativity and planning to the new temps called public participants?

Krohn, speaking about participation (in German 'planning cells') in the decisions around trash incinerators in the Black Forest, found indeed that 'participation is only used as an alibi'. While participating publics may be ready to attend the meetings and work hard on formulating their informed viewpoints within the organisational instrastructure and communication culture of the planning cell, and while that very interface exists to present the views to the institutional structures, the link between the public viewpoints and the official decision-making processes remains weak. As Brian Wynne said, stakeholders may be willing to take part in new forms of decision-making, but party politics are a conservative force. The unresponsiveness of parliament could undermine new participation experiments, leading publics back to social movements and direct action, back to 'yes or no' responses to the fait accomplis produced by old-school technology politics. Thus much is at stake in the outcomes of the public participation experiments.[3]

From the presentation by Vergragt, Bronislaw Szerszynski related that public participation is helpful if not necessary in monocultural situations, when there is little variety in the socio-technical options currently under discussion and/or when there is only one or two 'rationalities' (in a cultural theory sense) represented at the table and in the decision-making procedure. (Importantly for the future of public participation, the evaluation of public participation experiments similarly requires a variety of rationalities and stakeholder perspectives represented.) To ensure diversity in the proposals made by the publics, the procedures themselves must encourage not rule-following, but rule-breaking and new kinds of 'breaching experiments'.

Hajer, too, spoke about procedures and processes that erode formal procedures, but from a governmental and legislative point of view. Speaking about his previous work in Munich and in the Hague, and chiming with Krohn and Wynne's points above, one can only move away from 'feet on the table' politics in back rooms by shifting discourses. Instead of attempting to intervene in 'technology', where market forces and proprietary knowledge cultures predominate, intervention should occur in a realm which is open to governments (and to the people) to control more directly. Shift the discussion from 'technology' to 'land use', was the plea. There is a broader social agenda, concerning community and social cohesion, in any debate about land use than in any debate about, say, 'transport', with its narrow sectoral focus. Participation in the name of civic culture would have more purchase in the land use and other broader discourses under direct national, regional and local legislative control.

The ensuing discussion was sharpened by Peter Fisch of the European Commission (DG XII), when he asked whether participation researchers could themselves shift discourses, from this meeting to a more official one, with higher stakes. As management studies and other policy-oriented researchers are wont to do, would participation scholars be willing and able to concoct action 'recipes' for policy-makers and publics to digest? What if the Minister of Transport asks for a short book on how to manage participatory experiments?[4] While many

asked whether recipe books are the only types of scholarly inputs with an impact on policy-makers, it was pointed out that any would-be recipe maker would have to be reflexive in creating and communicating his or her pie-chart. It remains important, in other words, to think through the normative consequences of one's own participatory work. When participation entrepreneurs organise meetings, debates and social experiments, participation needn't be discussed and evaluated for its own sake only.

Indeed, the practitioners tended to evaluate the procedures and experiments in terms of the tangible outcomes. Four were presented. Tineke van de Schoor from the National Committee for International Cooperation and Sustainable Development (NCDO) described the procedures and outcomes of the 8 Dutch public debates on sustainability held every April since 1996. The debates are organised, it was said, to allow for the formulation of an informed public opinion, aimed directly at politicians. It is meant as alternative to the 'opinion carousel', whereby lobbying and the media end up being the most memorable inputs in political debate. Initially, social groups and journalists take stock of the sustainability debates in the Netherlands, and assemble a series of position statements and recommendations around a concrete issue. The debate method involves organising a panel of experts, which is questioned by two politicians, in front of members of the general public. (This switches the usual role of politicians, which has positive social learning effects.) Politicians then present what they've made of the issues, and an open debate ensues between the politicians, the experts and the publics. An average of 800 participants have been attracted to the debates by newspaper advertisements, and the results are published in an annual *Chronicle of Sustainability in the Netherlands* (in Dutch). Here the distinction between stakeholders and the general public was drawn out, with the Dutch public debate really only reaching the segment of the population previously informed and interested in the issue at hand.

Henk van Zuylen described the Infralab experiments, applied by the Dutch Ministry of Transport, Water Management and Public Works. Transport infrastructure 'customers' are asked to present their views on a problem, as traffic congestion on a particular motorway. Lists of experiences and problems are drawn up and handed to transport experts. The user and expert groups then meet in an Agora or 'idea marketplace', and together construct a series of proposed solutions for the Ministry to consider. Van Zuylen related that the most creative solutions do not survive consensus formation, as in the process the participants become more and more 'realistic'. Participants do develop confidence in dealing with the different expertises and specific discourses, lowering the overall participation threshold for the future.

The final two experiments concerned new computer-based interfaces for participation and public understanding. Jeanine de Bruin and Michael Murtaugh of newMetropolis described their work on the debate engine, while Richard Rogers showed a conceptual tool, called DebateScape, under development at the University of Amsterdam and at Computer-Related Design at the Royal College of Art, London.[5] The newMetropolis debate engine takes science center visitors through a series of scenarios about the future spatial planning of the Netherlands, planned parenthood or other issues. Once the visitor views the position descriptions for each scenario or future situation, they are asked to vote for the most desirable one. The opinions are collected and forwarded to the relevant ministry, as a valuable input to the debate. (In the past, newMetropolis has assembled more opinions on the issues than the Ministry in its postcard campaigns.)
DebateScape, currently at a conceptual stage, aims to create a socio-epistemological context for the public understanding of particular issues on the web. Departing from the lack of source context in search engine returns, it sees organisations' websites as spaces where positions on issues are taken. The tool would landscape relevant organisations' websites as a debate by displaying which organisations recognise other organisations as parties to the debate (the hyperlink map) and how these organisations 'spin' or frame principal knowledge claims made in the debate (the discursive map). The presentation explained the empirical research done on the climate change debate, showing that relevant organisations in the debate do upload their general positions (which may be mapped) and .orgs, .govs and .coms hyperlink in particularly telling styles. The hyperlink and discursive maps made for the climate change debate reveal a kind of cybergeography of knowledge and power, as was explained. Participants in climate change or other debates would be well-served by learning where organisations stand on the issues, and vis a vis one another, in real web time. Such a tool could be used in the initial stages of consensus conferences, public debates and the like.

The plenary discussions revolved around a number of issues, such as whether the participation experiments and techniques only provide those involved with the 'feeling' and 'experience' of participation. For participants this may be satisfactory in the short term, but without governmental follow-through on the publics' suggestions and creative proposals, trust in the participatory process will be lost. Having begun to shift the responsibility for the new projects to participating publics, government should see to its own responsibility in co-constructing not only the procedures but the resultant material culture.

NOTES

1. Andrew Jamison presented his paper, 'On the Dialectics of Sustainable Technologies'.

2. A portion of the meeting was devoted to reviewing the Commission-sponsored PESTO project, 'Public Participation and Environmental Science and Technology Options', from whence the formulation of 'technology policy meets the public'. On the project, see Jamision, A. (ed.), *Public Participation and Sustainable Development*, PESTO Papers 1, Aalborg University Press, 1997; and Jamison, A. (ed.), *Technology Policy Meets the Public*, Pesto Papers 2, Aalborg University Press, 1998.

3. Wolfgang Krohn presented his paper, written with Volker Vorwerk, "An Evaluation of a Participation Procedure in the Field of Waste Management in the Northern Black Forest".

4. Such books exist. For example, John Grin, a conference participant, has written a how-to guide to Interactive Technology Assessment, published recently by the Rathenau Institute.

5. Jeanine de Bruin (debruin@newmet.nl) has a paper available. The second presentation is written up in Rogers, Richard and Noortje Marres, "DebateScape: Landscaping Science & Technology Debates on the World Wide Web," unpublished ms., 1998.

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Sociality/Materiality
The Status of the Object in Social Science
Conference to be held at Brunel University, 9-11 September 1999

Call for Papers

Keynote Speakers will include: Bruno Latour, Rom Harré, Karin Knorr Cetina, Roy Boyne, William Pietz, John Law.

The key challenge for this conference is how we can rethink traditional conceptions about the performance of social order and social relations in the face of the newly appreciated impact of material environments and the socialising effect of 'things'. In view of the 'weakening' of traditional views of social reality as an entirely social realm, a familiar issue resurfaces: what holds society in place? If (post)modern societies are able to survive on much less structure, cohesion, or foundation than social theorists have generally assumed, how much cement, how much 'existence' does the social actually need? And what is the stuff that it is made of? Various new approaches in the anthropology and geography of material culture, in science and technology studies, in the new sociologies of consumption and risk culture, and in art criticism, have pointed towards an understanding of the performative and integrative capacity of 'things' to help make what we call society. By emphasising how much the social is ordered, held, and 'fixed' by the material, these new approaches pose a critical challenge to mainstream social theory, which has only been marginally interested in relationships between humans and nonhumans, culture and nature, or society and technology. This conference is designed to promote cross-fertilizations between these various 'new materialisms', and to the forging of critical links with more classical tropes and themes in the history of thinking about institutionalisation, reification, fetishism, and the 'realisation' of social facts. By focusing more intently upon the social life of objects and the expressive, retroactive, or 'interpellating' effects which they have on human behaviour, our hope is for the conference to reinvigorate and alter the terms of classical debates about idealism vs. materialism, realism vs. constructivism, agency vs. structure, or essentialism vs. fluidity and difference.

The conference will be organised into 4 main streams:

Fetishes and Facts:
new approaches to fetishism in anthropology, science studies, art criticism, cultural studies, psychology, feminism; cultural property; beyond idealism vs. materialism; things at risk/risky objects.

Realising the Social:
realism and constructivism: opposition and/or compatibility; performativity and social reality; how virtual is society?; approaches to reification.

The Culture of Objects:
the materiality of place; art(ificial) objects; emotional objects; object-centred sociality

The Disorder of Things:
social ordering and complexity; the fluidity of objects; streams of materialisation; objects and topology.

The costs of the conference will be:
Full Rate (including all meals and 2 nights accommodation): £185
Non-resident Rate (including all meals except breakfast): £135
Concessionary Rate - for Postgraduates (all meals and accommodation): £135

Booking forms will be sent out in February 1999 after the papers have been selected for the conference. If you would like to give a paper please send us a title and an abstract of no more than 250 words for consideration by 15th January 1999. The conference organisers can all be contacted at:
Dick Pels, Department of Human Sciences
Brunel University,
Uxbridge, Middlesex UB8 3PH
If you would like to attend the conference but do not intend giving a paper please write to us and we will put you on our mailing list to receive a booking form.
Organising Committee at Brunel University:
Dick Pels (dick.pels@brunel.ac.uk), Kevin Hetherington (kevin.hetherington@brunel.ac.uk), Frederic Vandenberghe (f.vandenberghe@brunel.ac.uk).

The Structures and Dynamics of Research Policies in Europe

EASST Workshop, 15-16 April 1999, University of Surrey, Guildford, UK

The purpose of this workshop, sponsored by the European Association for Studies of Science and Technology (EASST), is to bring together researchers involved in study of EU research policies and to discuss the variety of theoretical and methodological approaches underlying empirical studies. In addition, the workshop is intended to facilitate interaction between researchers and policymakers with the purpose of considering appropriate ways in which the knowledge being produced in this area of enquiry can be consolidated and fed into policy debates and structures, both within national and European settings.

The development and implementation of EU research policies poses a number of interesting and challenging questions for scholars within the field of science policy studies. First, there are questions about the content of such policies: what is specifically European about what the EU is advocating, where do the ideas originate, and how are global science policy trends translated into the European scene? Second, there are questions about the nature of EU policymaking processes: the actors, mechanisms, and processes involved in formulating EU research policies. Third, there are questions about the policy instruments employed: for example, the fit between the structuring of a Framework programme and the policy objectives it is designed to meet. And, fourthly, there are questions about the relationship between EU level activities and developments within national research systems, the impact of EU policies at various levels, from the transformation of local research practices to changes in national policymaking arrangements. Underlying all of these questions are concerns about the relationships, and flows of influence, between the EU and its member-states, as well as the position of the EU within a broader context of other trans- and international research initiatives.

Call for papers
We expect papers to engage with the questions raised above. Abstracts of no more than 250 words and a brief curriculum vitae should be sent to the postal or e-mail address below by January 4th 1999. Proposals should include an email address for correspondence. Abstracts from graduate students in all fields are encouraged.

If you wish to attend, but do not wish to present a paper, you should send a 250 word description of your current research interests by the same date. Decisions will be communicated by 30th January. The total number of participants is limited and will be not more than 40. In addition to the accepted proposals, there will be invited papers and discussants from the Commission.

The workshop will be held at the University of Surrey, Guildford, UK. Guildford is an historic town 50 km south-west of the centre of London. It is easily accessible from London Gatwick and Heathrow airports, or by train from London.

Programme Committee: Nigel Gilbert, University of Surrey; Maria Eduarda Goncalves, ICSTE, Lisbon; Rob Hagendijk, University of Amsterdam; Guenter Kueppers, University of Bielefeld; Arie Rip, University of Twente; Luis Sanz-Menendez, CSIC/RUSTEP, Madrid.

Proposals for presentations should be sent to: Dr Simon Dresner, Research Policies Workshop Coordinator, Department of Sociology, University of Surrey,Guildford, GU2 5XH or emailed to: s.dresner@surrey.ac.uk
DEADLINE: **January 18, 1999**.

Registration details will be sent to those whose applications for participation have been accepted. Registration fees (which include en-suite accommodation on campus, meals and refreshments during the workshop, and programme, abstracts etc.) are: Regular: £55 (85 ECU); EASST member £50 (75 ECU), Student £30 (45 ECU); Participants from countries with weak currencies £30 (45 ECU). Maps and information about how to reach the University of Surrey may be found at www.surrey.ac.uk/Where/index.html.

Conferences and Calls for Papers

A NATO Advanced Research Workshop (ARW) on *Industry As A Stimulator of Technology Transfer* will be held 18-20 March at the **University of Bialystock, Bialystock, Poland.** The conference will address such issues as (a) the actual and potential impacts of foreign technology transfer (TT); the barriers for its more extended impact; (b) the measures promoting the domestic TT and coordinating its orientation to the productive impacts of the foreign TT; (c) the regulatory measures oriented to the transformation of S&T institutions towards their functional growth and more interactive capacities. Participants include researchers, technology transfer practitioners and industry representatives from NATO and cooperation partner countries, including the former USSR and Eastern Europe, as well as Japan and Venezuela. Although the meeting is primarily based on invited papers, proposals for contributed papers are welcomed on the topics discussed in the concept paper below until the deadline of 15 January 1999. Please send abstracts to the conference co-directors Henry Etzkowitz spi@interport.net and Andrzej Jasinski zeiop@wena.uwb.edu.pl

On Human Nature: Biological Approaches and Philosophical Reflections is a Conference held from March 15 - 18, 1999, at the Dorint Hotel and Congress Center, **Bad Neuenahr-Ahrweiler, Germany**.
The Conference Language is English. The conference is organized by the EUROPEAN ACADEMY for the Study of Consequences of Scientific and Technological Advance Bad Neuenahr-Ahrweiler GmbH, in cooperation with the Research Project: "Genome and Organism"(from Christoph Rehmann-Sutter and Eva M. Neumann-Held), supported by the Foundation "Mensch-Gesellschaft-Umwelt" of the University Basel.

In the last century the industrial revolution, followed by several cultural and societal upheavals, marked the beginning of fundamental changes of our understanding of ourselves as "human beings". Now, at the end of the millennium, it seems that the authority for supplying explanations of human nature has shifted from philosophy and humanities to the natural sciences. In the public mind, it is particularly biology and medicine that are assumed to supply an almost unlimited access to "objective facts" on human evolution, history, and existence. Our Symposium aims to investigate such claims. We want to discuss the newest approaches in biology and medicine, and reflect on their philosophical and ethical foundations and consequences, respectively.

Five sessions are planned: Perspectives on Anthropology; Human Genetics; Genes, Evolution and Human Nature; Perception, Cognition and Mind; Technicalization of Man: Cultural Impacts and Ethical Problems.

Contributors will include: Ad Aertzen (Freiburg, Germany), Olaf Breidbach (Jena, Germany), Thomas Cremer (M^{n}nchen, Germany), Hans-Rainer Duncker (Giessen, Germany), Scott F. Gilbert (Swarthmore, PA, USA), Brian Goodwin (London, UK), Paul Griffiths (Sydney, Australia), Mathias Gutmann (Bad-Neuenahr-Ahrweiler, Germany), Henk ten Have (Nijmegen, The Netherlands), Ludger Honnefelder (Bonn, Germany), Peter Janich (Marburg, Germany), Helga Kuhse (Clayton, Victoria, Australia), Rolf Loether (Berlin, Germany), Alexandre Mauron (Geneve, Switzerland), Renato Mazzolini (Trento, Italy), Eva M. Neumann-Held (Bad Neuenahr-Ahrweiler, Germany), Geoff Parker (Liverpool, UK), Susan Oyama (New York, NY, USA), Oswald Schwemmer (Berlin, Germany), Christoph Rehmann-Sutter (Basel, Switzerland), Michael Weingarten (Marburg, Germany), Ulrich Wolf (Freiburg, Germany).
Deadline for registration: Feb. 1, 1999.
Conference Fee: DM 200,-; (students: DM 100,-), all other costs excluded.

For further information, please contact:
European Academy Bad Neuenahr-Ahrweiler,
Ms. Dagmar Uhl,
Landskroner Str. 175, Postfach 1460,
D-53459 Bad Neuenahr-Ahrweiler, Germany
tel.: +49 2641 754 300; fax: +49 2641 754 320
email: dagmar.uhl@dlr.de
Updated information is available at:
http://www.europaeische-akademie-aw.de

International Laboratory for the History of Science on *The Material Culture of Calculation* to be held from June 19 to June 26, 1999 at the **Max Planck Institute for the History of Science, Berlin**, calls for applications. The International Laboratory for the History of Science is a joint project of the Dibner Institute for the History of Science and Technology, Cambridge MA, the Max Planck Institute for the History of Science, Berlin, the Cohn Center, Tel-Aviv University, the Istituto e Museo di Storia della Scienza, Florence, and the Center for the History of Science, University of Athens. It brings together junior and senior scholars for seven to ten days each year to confront a focused and novel research topic through hands-on contact with instruments, techniques, as well as the study of texts. Approximately a dozen fellows meet with five or six senior scholars, experts in the topic to be dealt with in the particular year, for an intensive seminar under the sponsorship of one of the five participating institutions. The unity of the International Laboratory is one of approach rather than of theme: a workbench-like emphasis on the concrete sources of past scientific experience, whether embedded in objects, mediated by techniques, or displayed in words and images. The goals of the International Laboratory for the History of Science are: (1) to expand the preparation of younger scholars in the history of science and related fields by exposure to sources and methods not ordinarily included in graduate training; (2) to introduce techniques and perspectives from other disciplines (e.g. archaeology, cognitive science, art history) as they intersect with problems in the history of science; (3) to promote interactions of junior and senior scholars around a focused topic across national boundaries; and (4) to stimulate research on new areas in the history of science by concentrating scholarly attention on them by means of the seminars. The first International Laboratory for the History of Science took place in June 1998. It was organized by the Dibner Institute for the History of Science and Technology, Cambridge (MA) and worked on "Hidden Entities and the Devices that Manipulate them in the 18th and 19th Centuries". The second Laboratory will be hosted by the Max Planck Institute for the History of Science in Berlin, Germany. Junior scholars of all nationalities are herewith invited to apply for participation. The second meeting of the International Laboratory, The Material Culture of Calculation, will examine the historical development of ethnomathematics and of abstract arithmetic from proto-arithmetical practices in rural communities to sophisticated arithmetical techniques used by ancient, medieval and early modern administrators and merchants. For each level of historical achievements the work will be focused on the relation between material tools and operations by means of which calculations were actually performed, on the one hand, and the cognitive preconditions and outcomes of their application in the institutional contexts of economy and public administration, on the other hand. Arithmetical techniques will be studied in particular, that are known from the Far East, Mesopotamia before and after the invention of the sexagesimal positional system, Europe during the transition from the use of Roman numerals to the introduction of the Indo-Arabic decimal positional system, and pre-Columbian cultures before and in the sequel of cultural exchange with European colonizers. In some cases, the theoretical consequences of these technologies were far-reaching. Nevertheless, the manipulations and tricks of the trade which were once second nature to the communities of calculators have been largely submerged in the history of exact sciences. The very fact that such techniques were second nature to the experts who wielded them renders them effectively invisible, especially to historians who have grown up with different techniques for solving the same class of problems. There is a need for a hands-on excavation of these arithmetical techniques in close conjunction with careful examination of primary texts that document their former practice as well as of devices and techniques still used today by indigenous people in various cultures. At this meeting of the International Laboratory for the History of Science, the preconditions and implications of arithmetical techniques to be studied will be explored by actually practicing them and comparing the outcomes. Max Planck Institute for the History of Science is hosting the week. The organisers are Ubiratan D'Ambrosio and Peter Damerow. Arrival: Saturday, June 19, 1999; departure: Sunday, June 26, 1999. The working language of the Laboratory will be English. Applications should be sent to: Max Planck Institute for the History of Science, International Laboratory, Wilhelmstr. 44, 10117 Berlin, Germany no later than 31 January 1999.

The *11th International Congress of Logic,*

Methodology and Philosophy of Science will be held in **Cracow, Poland** on 20-26 August 1999. Those wishing to present a paper should send an abstract (max. 2 pages) to the Organizing Committee not later than February 1st, 1999. Abstracts of the contributed papers and all the other correspondence should be sent to: LMPS 99, Institute of Philosophy, Jagiellonian University, Pl. 31-041 Cracow, Grodzka 52, Poland, fax: + 48 12 422 49 16, e-mail: lmps99@grodzki.phils.uj.edu.pl, www.uj.edu.pl/Phils/congress. Program information on the 17 sections is available at the web site.

CHEIRON, The International Society for the History of Behavioral and Social Sciences will hold its thirty-first annual meeting June 10-13, 1999, at **Carleton University in Ottawa, Ontario, Canada**. Mari Jo Buhle, Harrison S. Kravis Professor of American Civilization and History at Brown University, will be the keynote speaker. Program submissions (papers, posters, symposia) may deal with any aspect of the history of the behavioral and social sciences, or with related historiographical and methodological issues. All submissions must be postmarked by February 1, 1999. Travel awards are available to assist students who present papers or posters. For further information, contact Ellen Herman, Department of History, University of Oregon, Eugene, OR 97403-1288. E-Mail: eherman@darkwing.uoregon.edu. Phone: (541) 346-3118. Fax: (541) 346-4895. Cheiron web site: http://www.yorku.ca/dept/psych/orgs/cheiron/cheiron.htm

Papers are invited for the panel session on *Science in Thai Culture*, which is a part of the upcoming 7th International Conference on Thai Studies, to be held in **Amsterdam, The Netherlands**, from July 5 to 8, 1999. Session topics include History of science in Thailand; Scientific culture vs. Thai culture; Western science and Thai science?; Science and the Thai belief systems; Science in an emerging economy; Thai public's understanding of science; Social, cultural and political problems arising from attempts at integrating scientific beliefs or 'scientific attitudes' into the Thai cultural universe; Science and Civil Society (e.g., the role of scientific attitude or critical thinking in fostering a strong civil society, etc.) More information can be found at the conference website, <http://www.pscw.uva.nl/icts7/>. Deadline for submission of abstracts and returning registration form is December 31, 1998. Abstracts (max. 250 words) should be sent to the Conference Secretariat via e-mail or regular mail. Conference Secretariat thaistud@pscw.uva.nl. Session organiser: Soraj Hongladarom, Department of Philosophy, Faculty of Arts, Chulalongkorn University, Bangkok 10330, THAILAND, Web Page: http://pioneer.chula.ac.th/~hsoraj/web/soraj.html

The *1st IEEE Conference on Standardisation and Innovation in Information Technology*, SIIT '99 in **Aachen, Germany** on September 15-17, 1999 has issued a call for papers. See http://www-i4.informatik.rwth-aachen.de/~jakobs/siit99/home.html To be innovative is crucial in today's increasingly competitive environment. This holds particularly for the deployment and utilisation of IT systems and applications, and it holds at both the corporate and the national/international level. Standards, on the other hand, have frequently been accused of hampering progress because of their slow development processes and an alleged lack of responsiveness to market needs. Yet, few large IT systems would ever materialise without them. With an unprecedented such system - the Global Information Infrastructure - on the horizon it is about time to study both innovation and standardisation processes, as well as - particularly - their interrelation. The conference aims at bringing together researchers and practitioners from the normally separated disciplines of telecommunications, technology studies, economics, business studies, management sciences, politics, and computer science, as well as IT users. Papers that address issues relating to standardisation and/or innovation in IT, with an emphasis on the 'and', are solicited. Sample topics of interest include: The role of standards in information infrastructures; National/regional standardisation policies; Analysis of, and new models for, standardisation processes; The role of consortia in standards making; The economic dimension of IT standards; The impact of standards on innovations, and vice versa; Corporate innovation processes; National and regional innovation policies; and Case studies relating to standards setting and/or innovations in IT.

All submissions must be original material not previously published, and not be under review

elsewhere. Each paper will be reviewed by at least two experts; accepted papers will be published in the conference proceedings. Submissions may be in the form of either full papers or short papers. Full papers should not exceed 6,000 words. Short papers (discussing e.g. concepts or research-in-progress) should not exceed 2,000 words. For both categories a separate title page should give the names and contact details of all authors (affiliation, postal address, e-mail, phone, fax). The key contact for correspondence must be clearly identified. The body of the paper should be preceded by a 200-words abstract. Electronic submission is strongly encouraged. Send a Postscript version or a PDF version of your paper either via ftp to ftp-i4.informatik.rwth-aachen.de/pub/incoming or as a MIME-encoded e-mail attachment to Kai.Jakobs@i4.informatik.rwth-aachen.de. Only if these options fail should hardcopies (4) of a paper be sent to Kai Jakobs; RWTH Aachen; Informatik IV; Ahornstr. 55; D-52074 Aachen; Germany. Deadline for Submissions: 5.3.99; Notification of authors: 3.5.99; Camera-ready versions: 6.6.99 The best papers relating to the global perspectives of the (IT standards and standardisation) field will be recommended for possible publication in the Journal of Global Information Management. The journal's home page can be found at http://www.idea-group.com/jgim.htm

Medical Professionals: Identities, Interests and Ideology, the 1999 Society for the Social History of Medicine Conference, to be held at the Western Infirmary Lecture Suite (**Glasgow**), will explore the issue of identity and the part it played in making medical professionals and the profession. D'Azeglio's oft-quoted comment upon the role of national identity in nation-building has become a cornerstone of theories of nationalism which see the nation as 'invented', 'imagined' or 'constructed'. How far can similar processes be said to be operating in the making of the medical profession? We hope the theme will encourage papers on a wide range of subjects including: the links between the processes of professionalisation and specialisation and the construction of medical identities; the ways in which medical practitioners have presented themselves; and how those outside the profession have represented the medical professionals. We would also welcome papers that explore medical biography and autobiography, and visual representations / images of medical professionals. As well as individual proposals, proposals for panel sessions consisting of at least three speakers will be considered. Abstracts of no more than 250 words should be sent to James Bradley before 15 January 1999 at the Wellcome Unit for the History of Medicine, 5 University Gardens, University of Glasgow, Glasgow G12 8QQ or email jbradley@arts.gla.ac.uk.

The *History of Philosophy of Science Group (HOPOS)* announces its Third International Conference to be held in conjunction with the Institute Vienna Circle (IVC) in **Vienna** from July 6th to July 9th, 2000. Contributions to the history of philosophy of science from all time periods and from all scholarly approaches are invited. The call for papers with full details will be made in Spring, 1999.

Submissions may be in English, German or French. Address inquiries to: Institute Vienna Circle, Museumstrasse 5/2/17, A-1070 Wien, Austria. Tel./Fax.: +431-526-1005, Email: i_v_c@ping.at (please refer to "HOPOS 2000" in the subject line). Websites: http://scistud.umkc.edu/hopos/index.html, http://hhobel.phl.univie.ac.at/wk

Between Physics and Biology: Chemical Sciences in the Twentieth Century (Joint Conference with the IUHPS/DHS Commission on the History of Modern Physics) will be held on 29-30 May 1999 at the **Deutsches Museum, Munich, Germany**. The conference will explore the emergence of new areas of chemical research in between the 'classical' disciplines, and will ask whether the traditional disciplinary boundaries are still appropriate for an understanding of contemporary scientific practice. This will be achieved by identifying the mechanisms by which disciplinary boundaries are transgressed and new areas of research created. The issues will include the transfer of methods, systematic vs. problem-oriented approaches, the role of specific materials (e.g. living tissues, polymers, surfaces) and the way these new fields are being organised. Leading historians of modern or contemporary science will address these questions under four headings: the emergence of theoretical and quantum chemistry, from radiochemistry to nuclear chemistry and cosmochemistry, chemistry and the solid state, chemistry and biology. Papers

will be pre-circulated and subjected to commentary during the conference. The audience will be limited to 50 participants. Younger scholars are particularly encouraged to apply for participation. Registration deadline: 15 April 1999. Registration fee: DM 40 (paid upon arrival). Inquiries and registration: Prof. Christoph Meinel, Wissenschaftsgeschichte, University of Regenburg, D-93040 Regensburg, Germany <christoph.meinel@psk.uni-regenburg.de>.

Defiant Modernism, a conference sponsored by **The London Science Museum**, British Society for the History of Science and the Institute of Contemporary British History will be held on 25-26 June 1999. The term 'Defiant Modernism', it is argued, describes well a historical epoch of enormous change as the technologies developed during the Second World War were exploited in war and thereafter adapted for civilian use. The period can be seen as stretching from the Munich crisis of 1938 to the student uprisings of 1968. It saw World War, the Cold War, retreat from Empire, cultural competition between Europe and America, and cycles of economic depression and prosperity. New technologies were developed, such as radar -which underpinned an electronic revolution- and penicillin -which led to a new era of medicine. The computer was born, and nuclear power seemed to offer energy without cost. In the aerospace sector, the jet engine transformed civilian and military aviation whilst rocketry inspired dreams of interplanetary travel. Plastics gave the world a new look. Social programmes were inextricably welded to the overall technocratic aspirations of the State, and the experience of centralised direction during the war suggested that they were achievable. In Britain it was felt that if we could have a supersonic 1000 mph fighter then the country could certainly also arrange decent housing for its people; the Welfare State was an integral part of the nation's technologial and industrial programme. As history of science and technology grapples with more and more recent periods, the post-war decades call out for study. The conference will explore the technologies of the era and the appropriateness of such master narratives as defiant modernism. It will also explore the literary and media manifestations of its subject. Treatments of the culture of technological innovation in Britain and in other countries will be welcomed. Conference organisers: Robert Bud (r.bud@ic.ac.uk) and Tim Boon, Science Museum. Expressions of interest from those wishing to present papers at this conference should be sent by 18th December to Tim Boon (t.boon@nmsi.ac.uk) (fax:0171-938-8050).

The *American Association for the Rhetoric of Science and Technology* (AARST), an affiliate of the National Communication Organization (NCA), sponsors panels at the annual NCA conference, to be held in **Chicago, Illinois**, on November 4 to 7, 1999. AARST invites submission of programs and paper proposals to cover any area of rhetoric of science, including the rhetorical analysis of science policy debates, the analysis of scientific texts, the transfer of scientific rhetoric into literary or other contexts, and the rhetorical impact of popular representations of science. While there is no need to join NCA in order to give a panel or paper, favorable hotel rates and airfares may make membership desirable for participants. Program proposals should include a rationale for the program, abstracts of papers to be featured, and the names, addresses and telephone numbers of participants. Submissions must be postmarked February 15, 1999 and should be sent to Alan G. Gross, Department of Rhetoric, University of Minnesota, St. Paul, MN 55108. While email or fax submissions are not acceptable, for inquiries you make contact Alan Gross at grossalang@aol.com.

Technical University of Gdansk announces the preliminary call for papers for an international conference on *Preservation of the Engineering Heritage-Gdansk Outlook 2000*. The conference will be held September 7-10, 1999. The main objective of the International Conference PEH-DO 2000 is to gather the relevant specialists in order to achieve an interdisciplinary overview of current research and to explore the benefits of conserving the engineering heritage for the benefit of present and future generations. All activities will be conducted in English. Participants wishing to present a paper are invited to submit an abstract in English of no more than 500 words. Three camera ready copies of this abstract and the relevant diskette, prepared in accordance with instructions, should be submitted by March 30, 1999 (extended from Dec 31). Detailed information about registration will be given in the final invitation. More information can be found at http://www.pg.gda.pl/~pehgo2000/ or from Waldemar Affelt at affew@pg.gda.pl

The *European Regional Science Association Congress* is in **Dublin** from 23rd-27th August 1999. Further details at http://www.ucd.ie/~economic/rsa/index.html

The *Society for Indian Philosophy & Religion* will hold an International Interdisciplinary Conference in **Calcutta** 1-4 August, 2000. The Conference theme is Language, Thought and Reality: Science, Religion and Philosophy. The theme can be addressed critically, reflectively and creatively by the philosophical, religious and scientific traditions of the World's great civilizations. The program will include plenary addresses, volunteered papers, invited papers and panel discussions. Registered participants who are members of professional associations or societies are encouraged to submit proposals for holding meetings in the conference on behalf of their associations or societies. The organizers are committed to upholding the highest academic standards with emphasis on the exchange of ideas and face to face dialogues among thinkers drawn from a wide range of the world's cultural traditions and movements. Some suggested topics: Knowledge and Reality, Appearance and Reality, Alternative Logics, Relativity and Relativism, Relativism and Absolutism, Moral Relativism, Ontological Relativism, Epistemological Relativism, Cultural Relativism, Deconstructionism, Existential Phenomenology, Culture and Meaning, Emptiness, Theories of Truth, Theories of Meaning, Theories of Consciousness, Eternal Sound, Realism and Idealism, Materialism and Spiritualism, Artificial Intelligence, Cognitive Science, Transcendence and Immanence, Skepticism, Agnosticism, Mysticism, Esotericism, Sociology of Religion, Science and Religion, Science and Philosophy. We welcome your participation and suggestion. If you would like to contribute a paper to this event please send an abstract of about 150 words to: Dr. Chandana Chakrabarti, Elon College Campus Box 2336, Elon College, N.C. 27244, USA. E-mail chakraba@numen.elon.edu. Phone (336) 538-2705, Fax (336) 538-2627. Deadline for proposals is April l, l999.

A *European Meeting on Applied Evolutionary Economics* will be held on 7 - 9 June 1999 in **Grenoble, France**. Evolutionary economics has became as one of the major frameworks for the understanding of modern knowledge-based economies. Issues of technological development, industrial dynamics, networking and firm behaviour are increasingly analysed as evolutionary processes. At the same time, evolutionary economics provide us with new models promoting regional development and innovation policies. At this moment, a major challenge is to develop systematic methodologies to enhance empirical studies in evolutionary economics. The objective of this first European Meetingon Applied Evolutionary Economics is to bring together researchers and PhD-students with an interest in the empirical application of evolutionary economics. By means of intensive discussion, we aim at a fruitful exchange of the latest method and tools in evolutionary approaches to economic change. Themes include the Dynamics of technological change (Diffusion, lock-in, variety, product life-cycle thesis, product and process innovation, technological trajectories); Industrial Organisation (Innovation and market structure, oligopolies and strategic interaction, networking, (SME's, finance, welfare economics); Knowledge and learning (Competence approaches, heuristic learning, learning-by-doing, tacit and codified knowledge, appropriability and patenting, spill-overs); and Technology policy models (Regional development, systems of innovation, sustainable technology development, university-industry-government relations). The meeting aims at an exchange of a wide variety of methodologies. Among these are econometrics, calibrated simulation, artificial economies, laboratory experiments and case studies research. The meeting will be hosted by the CNRS- Institute for Energy Policy and Economics (IEPE) and the INRA-Unit of Sociology and Economics of Research & Development (SERD), both located at the Grenoble. The Co-ordinator is Pier Paolo SAVIOTTI (INRA-SERD). Send papers to : IEPE, BP 47 38040 Grenoble Cedex 09, Fax : (33) 4 76 51 45 27, phone : (33) 4 76 51 42 40 , e-mail : iepe@upmf-grenoble.fr. See Call for Papers at : http://www.upmf-grenoble.fr/iepe/

The *3rd International Conference on Organizational Learning* will be held on 6-8th June 1999, **Lancaster University, UK**. The conference follows from two previous events

held respectively at Lancaster in September 1996 and at George Washington University in March 1998. The aim is to consider recent advances in research and theory building in the fields of organizational learning and the learning organization. Papers are invited primarily within the following themes:organizational learning and strategy; knowledge management and organizational learning; international and cross-cultural aspects of organizational learning; learning through inter-organizational cooperation; organizational learning and communities of practice; the politics and ethics of organizational learning; evaluations of learning organization interventions; the links between organizational learning and the learning organization; measuring, charting or diagnosing organizational learning. Please send any e-mail communications to Jill Roberts, J.Roberts@Lancaster.ac.uk.

Technology & Identity, a conference at **Cornell University**, will be held April 16-18, 1999. As a theoretical term, identity is being increasingly invoked by analysts in science and technology studies (S&TS) and other fields to order and explain actors' values, interests, practices, and more generally, world-views. As social constructs, heterogeneous assemblages can form, maintain, fragment, and completely transform the identities of collectivities and actors. The graduate students of the Science & Technology Studies Department at Cornell University announce a conference to explore the boundaries of identity, to be held April 16-18, 1999. How are identities constructed and defined? What work do actors achieve by drawing on identity as a resource? In our analyses, what work do we accomplish by using the term "identity" as compared to other theoretical resources? By focusing on the constructed boundaries of identity, including those between other identities, we hope to investigate core questions in S&TS such as how some identities are maintained or how a particular sociotechnical system can support multiple identities. Ken Gergen, Professor of Psychology at Swarthmore College, will deliver the keynote address. Although conference participants may study these questions at multiple levels, such as the nation-state or the laboratory, and with diverse empirical concerns, we expect papers to engage with theoretical questions raised by the intersection of technology and identity. Conference information is posted as available at http://www.sts.cornell.edu, or contact:Dan Plafcan, Abstract Coordinator, Science & Technology Studies, 726 University Ave., 2nd floor, Cornell University, Ithaca, NY 14850, USA, E-mail: djp2@cornell.edu.

The *Third Summer Symposium on the Philosophy of Chemistry and Biochemistry*, sponsored by the International Society for the Philosophy of Chemistry, will be held at the **University of South Carolina**, July 28, 1999 - August 1, 1999. The philosophy of chemistry has come into its own in the past decade. The journal, Foundations of Chemistry [http://www.cco.caltech.edu/~scerri/] will launch at the beginning of 1999. Synthese, volume 111, issue 3 was devoted entirely to the philosophy of chemistry. There have been numerous and conferences all over the world-London, Boston, New Orleans, Rome, San Francisco, Athens, Marburg, Bradford, Konstanz, Mexico City-in the past decade devoted to the philosophy of chemistry. A listserv [philchem@vm.sc.edu] now has more than 250 subscribers. Clearly a new discipline bringing together chemistry and the philosophy of science has been born. This conference will address the variety of directions that this new discipline might take. Inquiries and abstracts (by March 1, 1999): Davis Baird [bairdd@garnet.cla.sc.edu], Department of Philosophy, University of South Carolina, Columbia, SC 29208, USA.

The *International Society for History, Philosophy, and Social Studies of Biology* will hold its 1999 Meeting on July 7 - July 11 in **Oaxaca, Mexico**. The ISHPSSB program committee welcomes proposals for individual papers and sessions on topics related to all facets of the history, philosophy, and social studies of biology. Forms for submitting proposals are available at www.phil.vt.edu/ishpssb/submissions/program.html. The submission deadline is January 15, 1999. The International Society for History, Philosophy, and Social Studies of Biology (ISHPSSB) brings together scholars from diverse disciplines, including the life sciences as well as history, philosophy,mand social studies of science. ISHPSSB summer meetings are known for innovative, transdisciplinary sessions, and for fostering informal, co-operative exchanges and on-going collaborations. For further information consult the ISHPSSB web site or contact Michael Dietrich, Department of Biology, Dartmouth College, Hanover, NH 03755, USA, tel (603) 646-1171, FAX (603) 646-1347, Michael.Dietrich@Dartmouth.edu

The *Fifth International Conference of Advances in the Sociological and Economic Analysis of Technology* on 'Demand. Markets, Users and Innovation: Sociological and Economic Approaches' will be held in **Manchester, England** from 14-16 September, 1999. Over the last thirty years, the economics of technological change has discussed the relative importance of 'demand-pull' and 'discovery-push' as prime-movers of innovation; historians of science have modified internalist accounts of the development of scientific theories to bring in external social, economic and political influences; and in the sociology of science, technology and innovation, theories of social shaping or social construction have challenged technological determinism. More recently, various approaches have proposed 'hybrid' theories that allow demand pull and discovery push, or social, economic, political and technical forces, to interact, or, in the case of actor-network theory, have attempted to cut across the debate by following human and non-human actors and privileging neither. If an innovation is something that is both technologically novel and has either been the object of a commercial transaction or in some other way has become incorporated into the social fabric, then (by definition) it will not be successful if there is no demand for it - if users do not want it. Understanding user needs is now seen as one of the important factors in the success of innovation and it is one of the raisons d'Ítre of market research. But while we know how important demand, or understanding user needs, are in innovation, that does not tell us much about how they are actually detected or 'constructed' by innovators, if indeed this is a precursor to their being incorporated into innovations. Some firms only find out what users want (or do not want) when their innovation fails. Some innovations are commercialised by entrepreneurs who 'just know' what the market needs, or make assumptions about what customers want (often on the basis that the market is made up of people like themselves). Sometimes they are astonishingly successful - sometimes they get it completely wrong. In some cases elaborate exercises in market research and/or user trials are put in place. Where innovations are radical, firms probably will not be able to forecast the likely demand for them with any accuracy, and users may not know in advance that they have needs which the innovation might satisfy. In such cases an iterative process involving lead users and early adopters may take place, in which technology and markets are simultaneously constructed, in interaction with each other. Enquiries about this conference may be made to: Rod Coombs (+44)161.200.3435 Rod.Coombs@umist.ac.uk,Ken Green (+44).161.200.3432 Ken.Green@UMIST.ac.uk, Vivien Walsh (+44) 161.200.3434 Vivien.Walsh@UMIST.ac.uk. or Albert Richards (+44)161.200.3403. Albert.Richards@UMIST.ac.uk Details about the previous ASEAT Conferences, and the subsequent publications, can be found on the Conference page at the CROMTEC Web Site at http://www.umist.ac.uk/UMIST_Cromtec/

Cities in the Global Information Society: An International Perspective, An International Workshop Sponsored by BT and the Economic and Social Research Council (ESRC), and Organized by the Centre for Urban Technology (CUT) and the Centre for Urban and Regional Development Studies (CURDS) **University of Newcastle, U.K.** will be held 22nd - 24th November 1999, Durham, U.K. As we are about to enter the new millennium cities continue to dominate the global information society. Themes include 1. Mapping Cities in the Information Age. It will examine the role of cities in the development of new IT, media and telecommunication networks. We need to develop an understanding of how telecommunication providers construct the notion of cities as places to serve and invest in, within globalising contexts of regulation and infrastructure development. What type of cities are most valued and which are being by-passed by internationalising telecommunications investment strategies? How are decisions made about the roll-out of networks within and between cities? Where is most investment in urban telecommunications networks directed? How can we simultaneously understand the emerging geographies of IT and telecommunications use and investment within cities, and the emerging infrastructural linkages that tie cities into urban networks and hierarchies at increasingly international and even global scales? 2. Understanding Telecommunications-City Relations. The second

theme will examine how new telecommunications networks are involved in the changing economic, social, cultural, physical and environmental development of cities. How do electronic connections co-evolve with traditional face-to-face ones based on physical movement? How are the economic, social and cultural assets of cities being combined with electronic potential to link and relate with far-off places? In what ways are the urban landscapes and development processes of contemporary cities being reconfigured by burgeoning telecommunications-based interactions, near and far? How are patterns and processes of social division reflected and sustained by uneven access to electronic networks? How can we understand the relations between intra and inter-urban electronically-mediated relationships? How do experiences of IT-mediated urban change vary across different types of cities in different parts of the world? And can we build a comparative understanding of such diversity? 3. Integrating telecommunications into urban policy and planning strategies. The final theme of the Conference will examine the capacity for urban governance and policy agencies to creatively shape the development of their telecommunications assets, to help achieve positive developmental solutions for their cities. What regulatory and informal structures do urban governance agencies have for shaping investment priorities of telecommunications providers? How can they work with media, IT and telecommunications providers? How can the creative potential of IT-based innovation in cities best be harnessed to social, cultural and economic development and planning agendas? Can urban policy makers position their cities' telecommunications assets to help capture comparative advantage in a globalising world? How are cities being marketed as 'cyber', 'smart' or 'tele'-rich places? And how can policymakers integrate telecommunications within their landuse planning, economi dcevelopment and environmental strategies and plans? In order to stimulate the maximum spread of coverage of this wide research agenda, we are seeking abstracts from researchers and policy makers who are actively researching or developing initiatives in cities from the following typology of eight broad types of cities: 1. Old-Industrial Cities (e.g. Newcastle, Pittsburgh, Essen; 2. 'Global' Cities (e.g. London, New York, Tokyo, Singapore); 3. '2nd Tier' Regional and National Capitals (Amsterdam, Dublin, Milan, Taipei, Toronto, Sydney; 3. Newly-Industrialising Cities (Pearl River Delta etc); 4. Former Communist Cities (eg. Moscow, Warsaw, Budapest); 5. Globally Marginalised Cities (e.g. Soweto, Sub-Saharan African cities); 6. Information-Processing Cities (e.g. Sunderland, Bangalore, Kingston, Jamaica); 7. Resort and Tourism Cities (Palma, Orlando etc); 8. Logistics Cities (e.g. Kingston, North Carolina, Rotterdam); and 9. New Planned Cities and Urban Spaces). Can ambitious urban corridors and projects like Malaysia's Multimedia Super Corridor and Japan's technopoles succeed in implanting globally innovative and sustainable IT-based industries ? What are the implications for such strategies for urban planning, social divisions, and local-global relations? The Deadline for Submission of abstracts is December 31st 1998. Send a 200 word abstract to: Elizabeth Storey, Centre for Urban Technology, Department of Town and Country Plaanning, Newcastle University, Newcastle upon Tyne, UK, E-mail: elizabeth.storey ncl.ac.uk

The 26th Symposium of the *International Committee for the History of Technology* (ICOHTEC) will be held August 16-21, 1999, in **Belfort, France**. The general theme of the ICOHTEC Symposium is technological choice, and, as always, a variety of social activities are being planned in conjunction with the meeting, including an evening with ICOHTEC's own jazz group "The Email Special." The ICOHTEC Symposium will be held at the University of Technology of Belfort-Montbeliard (UTBM), in the eastern part of France (France-Comte) close to South-Alsace (Mulhouse). Switzerland (Basel) and southwest Germany (Baden-Wurtemberg). The closest international airport is Basel, with a shuttle to Belfort. Local contact: Michel Cotte, Universite de Technologie de Belfort-Montbeliard, Rue du Chateau, SEVENANS, F-90010 BELFORT, France, fax: (33) 03 84 58 31 78. email: Michel.Cotte@utbm.fr

The 1999 Annual Conference of the *Social Policy Association* will take place at **Roehampton Institute London** from July 20-22. The conference is being organised by a team from the School of Sociology and Social Policy at Roehampton Institute (Judith Glover, Hazel May and Lorraine Radford) together with Ros Edwards (South Bank University). The theme is 'Social Insecurity and Social Policy'.

Contributions are solicited on the following topics: violence and safety; welfare, risk and social capital; identity; stratification and difference; comparisons: geographical and historical; New Labour; technology; globalization. First Call for Papers: Deadline March 19, 1999. Enquiries to +44(0)181 392 3604.The SPA Conference Secretariat, School of Sociology and Social Policy, Roehampton Institute London, 80 Roehampton Lane, London SW15 5SL UK

The IVth Conference of the European Sociological Association (ESA) will have as its theme: Will Europe Work? The Conference will be held 18-21 August 1999, Amsterdam, the Netherlands.

Call for papers:

We are organizing two (90 minutes) sessions on research and development activities in Europe. We invite you to participate in this stream of sessions and present papers.

Worldwide, research and development (R&D) in universities, public labs and in the private sector is undergoing change. New descriptive concepts such as the "Mode 2 production of knowledge", the "Triple Helix of university-government-industry relations" and "post-academic science"
have been introduced to illustrate the institutional, organizational and procedural aspects of change. These concepts emphasize the evolutionary and global character of the transformation process. However, as their theoretical value and empirical evidence are limited, the respective analyses have tended to underestimate or neglect agency and control on the one hand and the role of national, regional and local factors of the process on the other. Both groups of factors have prevented R&D from converging at a uniform pattern of doing research. The ways they have shaped R&D will be specified and traced in the proposed string of sessions focusing exclusively on Europe.

The European knowledge industry provides a multifarious picture of institutional and organizational forms of R&D. These forms have developed as a result of a coincidence and interaction of pervasive internal dynamics of change, such as the shift towards Mode 2, with impacts from national policies, European integration and the break-down of the iron curtain.

The sessions will deal with the following issues:

- new forms of R&D and teaching at the universities
- basic research in different organizational settings ("public"/"private")
- dynamics and patterns of collaboration in R&D
- links and boundaries between R&D and practice
- new provisions of resources and career opportunities in R&D
- government intervention (regulation) and autonomy in R&D processes
- national and European potentials to innovate and compete in R&D.

Papers referring to any of these subjects from a theoretical and/or comparative perspective and in the view of national case studies are invited.

According to the rules of the European Sociological Association (ESA), title and abstracts (350 words) of the proposed paper must be sent to the session organizers (preferably by email) until February 1, 1999. The notification by the organizers will be made by April 1, 1999. Papers should be made for circulation by July 31, 1999.

Organizers of the panels are:
Raymund Werle (Max Planck Institute for the Study of Societies, Paulstr. 3, 50676 Köln, Deutschland, Tel. +49 221 2767224; Fax +49 221 2767555; E-mail: werle@mpi-fg-koeln.mpg.de);
Marja Alestalo (University of Helsinki, Department of Sociology, P.O. Box 18 (Unioninkatu 35), 00014 Helsinki, Finland, tel. + 358-9-191 23964; fax. + 358-9-191 23967; E-mail: marja.alestalo@helsinki.fi);
Maarten Mentzel (School of Systems Engineering and Policy Analysis (SEPA), Delft University of Technology, POBox 5015, 2600 GA Delft, The Netherlands, tel. +31 (15) 278 8458; fax +31 (15) 278 3429; E-mail: mentzel@sepa.tudelft.nl).

For general information on the conference please visit the ESA web site: http://www.qub.ac.uk/esa/conf99.htm

The Network of European Centres in Science and Technology Studies announces a conference on *Regional innovation systems in Europe*. Venue is Donostia-San Sebastian, Spain, the conference will be held 30 September - 2 October 1999

In recent years there has been an increasing recognition of the importance of the regional level for the definition and implementation of

innovation strategies in Europe. Regional governments are the decision level closest to economic and research actors and in many cases they have acquired competences in innovation policy. The aim of this conference is to analyze and explain regional experiences of technological innovation in Europe, from the point of view of the generation of innovation capacities, science and technology policies, cultural aspects, and learning processes.

PROGRAMME COMMITTEE

Ash Amin (Durham), Bjorn Asheim (Oslo), Katalin Balazs (London), Miquel Barcelo (Barcelona), Kate Barker (Manchester), Joan Bellavista (Barcelona), Lucio Biggiero (Rome), Joe Cogan (Dublin), Philip Cooke (Cardiff), Susana Borras (Roskilde), David Charles (Newcastle), Charles Edquist (Linkoping), Wendy Faulkner (Edinburgh), Ulrike Felt (Vienna), Artemios Kourtessis (Brussels), Georg Krucken (Bielefeld), Loet Leydesdorff (Amsterdam), Mikel Gomez-Uranga (Bilbao), Martin Heidenreich (Bielefeld), Tom Higgins (Dublin), Mikel Landabaso (Brussels), Peter Maskell (Copenhagen), Robin Miege (Brussels), Manuel Mira Godinho (Lisbon), Alfonso Molina (Edinburgh), Matjaz Mulej (Maribor), Emilio Munoz (Madrid), Philippe Mustar (Paris), Mikel Olazaran (Bilbao), Miguel A. Quintanilla (Salamanca), Slavo Radosevic (Sussex), Arie Rip (Twente), Carlos Roman (Sevilla), Luis Sanz (Madrid), Josephine Stein (London), Rolf Sternberg (Koeln), Joice Tait (Edinburgh), Franz Toedtling (Vienna), Xavier Vence (Santiago), Ger Wackers (Maastricht).

ORGANIZING COMMITTEE

Manu Ahedo (Bilbao), Xabier Arrazola (Donostia), Begona Asua (Donostia), Anton Borja (Bilbao), Ana Dudkiewicz (Vitoria), Maite Espi (Donostia), Alberto Fernandez (Bilbao), Inaki Heras (Donostia), Izaskun Igeregi (Bilbao), Jesus M. Larrazabal (Donostia), Cristina Lavia (Bilbao), Monica Moso (Bilbao), Mikel Olazaran (Bilbao, Secretary), Fernando Sierra (Bilbao), Katrin Simon (Pamplona), Maria J. Triguero (Vitoria), Javier Urrutia (Vitoria), Arantza Zubiaurre (Donostia).

INVITED SPEAKERS

There will be about 11 invited speakers. Speakers invited so far include Philip Cooke (Cardiff), Charles Edquist (Linkoping), Mikel Landabaso (Brussels), Loet Leydesdorff (Amsterdam), Slavo Radosevic (Sussex), Arie Rip (Twente) and Michael Storper (Los Angeles and Paris).

CONTRIBUTED PAPERS

The deadline for submission of 3-4 page abstracts of contributed papers (in English) is June 10, 1999. Each abstract will be sent to at least two referees from the Programme Committee. Notification of acceptance: by July 30, 1999. Abstracts submitted by e-mail will not be accepted. Please send 3 copies of your abstract to this address:

NECSTS'99
ILCLI, UPV-EHU
Villa Asuncion
Avda. Jose Elosegi 275
20015 San Sebastian, Spain.

Authors must include their complete address (including their e-mail address).

REGISTRATION

Registration fees before September 2, 1999: 16,000 pesetas (students and accompanying persons 8,000 pesetas). After Sept. 2: 20,000 pesetas (students and accompanying persons 10,000 pesetas).

PROCEEDINGS

The Proceedings of the Conference (invited papers and a selection of contributed papers) will be published as a book by an international publisher.

TRAVEL

The city airport is Hondarribia which is about 18 kms from San Sebastian. Participants arriving to Bilbao airport should take a taxi from the airport to the central coach station (downtown), and then take a coach (by motorway) to San Sebastian.

FURTHER INFORMATION

For further information please contact Mikel Olazaran, e-mail:
cipolrom@lg.ehu.es
fax: +34.94.464 8299 http://www.ehu.es/TOI/

Net News

A Bio-bibliographical Directory to Writers on the Theory, History, and Culture of Science and the Humanities can be accessed at http://www.uni-bremen.de/~kr538/directory.html. It offers bibliographical information for about 730 authors and can be downloaded (about 288 KB) and searched off-line. It is particularly rich in German-language authors that may be difficult to trace outside Germany. Also offered is the only machine-readable version of Francis Bacon's Advancement of Learning (1605) along with Immanuel Kant's Lectures on Pedagogics (1803) and three short pieces by Immanuel Kant and Auguste Comte. The page is maintained by Dr. Hartmut Krech of Bremen, Germany, kr538@uni-bremen.de

Arts & Letters Daily is a new web site on the arts, philosophy, the social sciences and humanities. See http://www.cybereditions.com/aldaily

A new electronic journal of philosophy, SYMPOSIA is devoted to providing a forum for the presentation and discussion of new thought. It's at www.trincoll.edu/~phil/symposia/symposia.html As the millennium approaches, philosophical discourse in this country appears to be in danger of giving itself over, in large measure, to the repetition of the positions and arguments of canonical figures (old and new). And what passes for "contemporary" thought, in this context, often amounts to little more than polemicizing. Our contention, on the contrary, is that philosophy is alive and well-and we mean to back this up with evidence of the most concrete kind. What we recognize in this situation, however, is the need for a special kind of forum-one that makes room for new and different kinds of thinking by refiguring the manner in which we have become accustomed to "doing philosophy." Accordingly, each issue of SYMPOSIA will cite a key paragraph as its "topic text." This text will serve as the focal point for criticism, commentary, intervention, debate, invention. And as the "academic voice" of present philosophical discourse drops away, the stage is set for original thought.

Public Perspectives on Human Cloning, a new report, from the Wellcome Trust's Medicine in Society programme, presents findings from an innovative research study looking at public views on human cloning and its uses. The research shows that the public can quickly get to grips with detailed scientific concepts and, whatever their background or personal circumstances, were overwhelmingly against cloning. Most were strongly against the idea of using cloning for reproductive purposes, stemming from concerns for the children and society as much as from fears about 'unnatural' science. The potential for cloning techniques to benefit medical treatments was recognised but there was concern about what types of research and their uses would be acceptable. The study also identified a distrust among participants of scientists' motives and regulatory frameworks. Using reconvened focus groups and depth interviews this qualitative research demonstrated that the public can think deeply and speak cogently about the social implications of science. On the subject of human cloning they have more fears than hopes. To download or order a hard copy of this new report, visit the Wellcome Trust's web site http://www.wellcome.ac.uk/publications

A web site dedicated to the *science wars controversy* is at http://www.members.tripod.com/~ScienceWars/index.html. It offers an archive, a forum, a chat room, a guest book, and a periodically updated poll on "Science Wars" questions. Also, a science-wars list has been established for those interested in joining the "Science Wars" Monitor working group. Those interested may subscribe by sending mail to science-wars-subscribe@egroups.com.
Newly added to the science wars site are Steve Fuller Articles, The Sokal-Weinberg Theory of Reading by Gabriel Stolzenberg, What the Sokal Hoax Ought to Teach Us by Paul A. Boghossian, and Sokal's Hoax by Steven Weinberg.

Cultural Studies, the journal, is available on-line at http://www.routledge.com/routledge/journal/cs.html by subscription.

The new *Center for Women and Information Technology*, run out of the University of Maryland, Baltimore County (UMBC), may be found at http://www.umbc.edu/cwit/. It provides information about the Center and offers a variety of resources related to women and IT: web sites focusing on women and technology, e-mail lists with a similar focus, news coverage of women and IT, announcements of conferences and calls for papers, a collection of more than 500 web-based syllabi for women- and gender-related courses (syllabi making substantial use of the Internet are marked), and more.

The APA Monitor Online, published by the American Psychological Association, is at http://www.apa.org/monitor/ The American Psychological Association (APA), in Washington, DC, is the largest scientific and professional organization representing psychology in the United States and is the world's largest association of psychologists. If you wish to send feedback, letters to the editor, and other correspondence, you may contact the Monitor office at letters.monitor@apa.org

There is a new email forum and web site on Object Relations in Psychoanalysis at object-relations@human-nature.net. It would be a pity to predetermine the scope and emphases of this forum, but its inspiration is an interest in Klein, Bion, Post-Kleinians, Winnicott, Fairbairn, Guntrip and other and more recent writers in the object relations tradition within psychoanalysis. There is an existing list on Bion and there is an object relations web site, but there is no forum or web site specifically dedicated to this particular stratum of theory. This forum and its associated web site are designed to fill this void.
To subscribe, send an email To:
majordomo@human-nature.net
Body of message: subscribe object-relations
After you join, messages for the forum should be sent to object-relations@human-nature.net
Form Moderator: Robert M. Young. Co-moderator: Michael Szollosy, egp97ms@sheffield.ac.uk, University of Sheffield.

The Eindhoven Centre for Innovation Studies (ECIS) is proud to announce the start of a working papers series in the field of innovation studies, innovation management and innovation policy. ECIS is a newly created research institute at the Faculty of Technology Management of the Eindhoven University of Technology in the Netherlands. The research of ECIS focuses on the sources and consequences of innovation both within organisations and in networks, sectors and national economies. The Eindhoven Centre for Innovation Studies presently consists of a group of 25 researchers from various disciplines, including economics, management sciences, engineering sciences, sociology, legal sciences and history. The ECIS working paper series is set up to disseminate preliminary research results of ECIS research to other persons and institutions with related interests, all over the world. ECIS working papers will be made available through the ECIS internet site: http://www.tue.nl/tm/ecis/

A Web site for cognitive science, http://cogprints.soton.ac.uk, is an electronic archive for papers in any area of Psychology, Neuroscience, and Linguistics, and many areas of Computer Science (e.g., artificial intelligence, robotics, vison, learning, speech, neural networks), Philosophy (e.g., mind, language, knowledge, science, logic), Biology (e.g., ethology, behavioral ecology, sociobiology, behaviour genetics, evolutionary theory), Medicine (e.g., Psychiatry, Neurology, human genetics, Imaging), Anthropology (e.g., primatology, cognitive ethnology, archeology, paleontology), as well as any other portions of the physical, social and mathematical sciences that are pertinent to the study of cognition. CogPrints is a service to two consituencies. For authors, it provides a way to make their pre-refereeing preprints and their refereed, published reprints available to the world scholarly and scientific community on a scale that is impossible in paper. For readers, it provides free worldwide access to the primary scholarly and scientific research literature on a scale that is likewise impossible in paper.

Opportunities Available

The **Winterthur Museum, Garden, and Library** invites applications for its 1999-2000 *residential fellowship program*. NEH fellowships also are available to scholars pursuing advanced research for four to twelve months, with stipends up to $30,000, as are McNeil dissertation research fellowships: available for full year or semester; $6500 per semester. Winterthur research fellowships: available to academic, museum, and independent scholars, and to support dissertation research for one to six months; stipends of $1500 per month. Winterthur's rich and varied library collections include half a million imprints, manuscripts, visual materials, and printed ephemera that support research in the seventeenth through the early twentieth centuries. The museum collection includes 89,000 domestic artifacts and art objects made or used in America to 1860. Research topics might include: history of the family, domestic life, childhood, consumerism, Shaker history, decorative arts, garden history, pre-industrial crafts, business history, the history of travel and leisure, popular memory, and many other topics in American art history, social and cultural history, and material culture. Application deadline for all fellowships is January 15, 1999. For an application packet, please write to: Gretchen Buggeln, Director, Research Fellowship Program, Office of Advanced Studies, Winterthur Museum, Winterthur, DE 19735, (302) 888-4649, email:pelliott@winterthur.org

University of North Carolina at Chapel Hill, Department of Anthropology, intends to hire a sociocultural or historical anthropologist specializing in research on science, technology, and society. The position is tenure track, with expectation of hiring at the Assistant Professor level starting Fall semester 1999. Please send a narrative statement of teaching and research interests, a curriculum vitae, and the names of four referees by 11 December 1998 to Chair, STS Search Committee, Department of Anthropology, CB #3115, UNC, Chapel Hill, NC 27599-3115. Women and minorities are encouraged to apply. EOE/AAE.

History of Technology and/or Science, Europe or U.S. Since 1800. **Iowa State University**. Assistant professor, tenure track. Teaching introductory and graduate courses. Requirements include Ph.D. by time of appointment and demonstrated commitment to scholarly research and publication. Strong preference given to someone who specializes in the history of chemistry, medicine and/or technology, studies continental Europe, especially Germany or France, and takes an intellectual history approach. Evidence of successful classroom teaching also preferred. Deadline December 11, 1998, or until the position is filled. Salary commensurate with qualifications. Women, minorities, and members of other protected groups are encouraged to apply. Iowa State University is an EO/AA employer. Send letter of application and credentials, including three letters of recommendation, to Professor Alan I Marcus, Department of History, Iowa State University, Ames, Iowa 50011-1202, USA.

Internationales Forschungszentrum Kulturwissenschaften (IFK) has announced a research program on the *The History of Kulturwissenschaften and Cultural Studies*, and calls for applications. The current praxis and self-image of Kulturwissenschaften are those of a young branch of scholarship. Nonetheless, the field has historical antecedents, an awareness of which is vital to its continued development. These origins, which might almost be described and explored as a hidden or lost history since they antedate what is commonly known as Kulturwissenschaften today, are little known and conceptually diffuse. Yet the vast expansion of Kulturwissenschaften would now appear to have created a particularly urgent need for historical self-analysis, as an impetus to (self-)critical examination and a counterweight to the increasing impoverishment of this research paradigm. The German word Kulturwissenschaften is used with a double meaning: firstly to denote the specific contents and traditions of cultural analysis and cultural theory in the German-speaking world, and secondly to refer to comparable schools of thought in other academic cultures and traditions. Kulturwissenschaften are not to be

confused with cultural studies in the Anglo-American context. The names associated with the history of Kulturwissenschaften go back to a great diversity of national academic cultures and traditions. Such disparate figures as Sigmund Freud, Georg Simmel, Aby Warburg, Thorstein Veblen, Emile Durkheim, Maurice Halbwachs and Raymond Williams - we refer here of the period between 1890 and the 1950s - were all initially at home in the traditional academic disciplines. However, they did not exclusively identify themselves with these, but were distinguished by an often unreflected tendency to surmount academic boundaries and take interdisciplinary approaches. Common to all is the fact that they were rooted in a given discipline which they took as their starting point, to which in a sense they remained true, and to which they generally returned in order to consolidate the insights gained from exposure to, and exchanges with other disciplines. Yet at the same time, to some extent unintentionally, they created new methodologies and paradigms which, in the course of time, became established as authentic elements of Kulturwissenschaften. The research paradigms that became associated with the history of Kulturwissenschaften before the discipline referred to itself or was known as such are highly heterogeneous and were at first largely unconnected. They range from the philosophy of symbolic forms (Ernst Cassirer), the theory of socio-economic transformation (Karl Polanyi), the sociology of collective memory (Maurice Halbwachs), the annales school of historiography (Marc Bloch, Lucien Febvre), and questions relating to pictorial memory (Aby Warburg) through to media theory (Walter Benjamin, Siegfried Kracauer and Marshall McLuhan), historical human geography (Vidal de la Blaches and Ferdinand Braudel), and Cultural Studies (Raymond Williams and Richard Hoggart). It goes without saying that these are highly disparate valeurs, yet from today's perspective all form part of the canon of the history of Kulturwissenschaften. The paradigms generated by Kulturwissenschaften have always been bound up with a programmatic commitment to the transcending of disciplinary boundaries. The object of this new research program is to undertake a systematic historical reconstruction of such conceptual frameworks. The Internationales Forschungszentrum Kulturwissenschaften (IFK) believes that this will contribute to a better understanding of contemporary Kulturwissenschaften. This calls for a clear demarcation of the discipline in relation to others an urgent necessity in view of the bifurcation of historical, philological and hermeneutic positions, on the one hand, and sociological, culturalist and ethnographic approaches on the other. While the formative stages of Kulturwissenschaften owed much to intellectual projects rooted in the German-speaking world, its historical reconstruction cannot be confined to these developments. Equally central and innovative approaches were developed in the French and English speaking contexts, and the history of the emigration of the proponents of German Kulturwissenschaften led to the emergence of new paradigms associated with other cultures and disciplines. The questions raised could include: What new impulses could be given by the perspectives and visions of Kulturwissenschaften? What, in this connection, are the roles played by internal factors within a discipline (specific culture and traditions, degree of professionalization, peer groups, etc.) and by exogenous factors (politics, zeitgeist, social developments, the social roles of intellectuals, and interactions with ideological currents)? Which figures exercised a determining, long-term influence on the "world view" of Kulturwissenschaften, and from which cultural, geographical and institutional settings did they emerge? Which theoretical and empirical syntheses are particularly characteristic of them? In what manner and for what reasons did "culture" become the signifier for new approaches in various disciplines ("culture" as the prefix for specialisms as varied as cultural sociology, cultural psychology, cultural history or cultural anthropology)? How have the conceptual frameworks of Kulturwissenschaften related to the traditional dichotomy between culture and nature, and to what extent has the relationship between culture and power been dealt with? What are the characteristics of the history of the discourse of Kulturwissenschaften in the German-speaking world and that of the Anglo-American school of Cultural Studies, and what are the differences and common ground between these two discursive formations? Which national and international exchanges and migrations led to the emergence of new projects and paradigms in Kulturwissenschaften? What gains in terms of innovative thought and synthesis, and what losses and weaknesses have these cross-currents resulted in? What influences have Kulturwissenschaften exercised on the cross-fertilization of disciplinary and extra-disciplinary research? What forms of expression

(academic, essayistic, literary or journalistic) and patterns of reception have played a part in the dissemination and acceptance of the projects and paradigms of Kulturwissenschaften? Call for research proposals. The IFK will implement this research program by undertaking the following types of projects:
1) Workshops with a limited number of participants, a maximum of six speakers and a duration of between one-and-a-half and two days, dealing with the history of Kulturwissenschaften from the above perspectives and making an innovative contribution to the archaeology of these academic disciplines.
2) Fellowships, i.e. stipends to enable visiting academics to undertake research projects at the IFK concerned with the historical genesis of Kulturwissenschaften in the light of the biographies of the "founding fathers" of the discipline and of given complexes of issues.
Applications for projects forming part of the new research program must be made in writing, and must reach the IFK not later than:
Junior fellowships: April 1999; Research, visiting fellowships and workshops: 15 June 1999. Application forms are available.
Information: Dr. Lutz Musner, IFK Internationales Forschungszentrum, Kulturwissenschaften, Danhausergasse 1, A-1040 Vienna / Austria, Tel. +43-1-504 11 31, Fax. +43-1-5041132, email: musner@ifk.ac.at

The **Max Planck Institute for the History of Science in Berlin** offers a three-year position, beginning 1 September 1999, as a *research fellow* (assistant/associate professor level, depending on qualifications) in connection with an interdisciplinary, international research group on "The Moral Authority of Nature" organized by Lorraine Daston. Remuneration is according to the German academic pay-scale (BAT II), between 2500 and 3500 DM per month (net income, depending on age and marital status), with customary benefits. Applications from outstanding scholars in all specialties within the history of science (as well as other relevant disciplines, such as art history and anthropology) and of all nationalities are welcome. The colloquium language is English. Women candidates are particularly encouraged to apply. Qualification being equal, precedence will be given to candidates with disabilities. Please send a vita, publication list, brief project description (maximum 1000 words), and three letters of recommendation by1 March 1999 to: Max Planck Institute for the History of Science, Abt. Personal, Wilhelmstrabe 44, 10117 Berlin.

The School of Science & Technology Studies, **University of New South Wales** wishes to appoint a *Lecturer/Senior Lecturer* to assist in the development of its teaching and research in the history and philosophy of science or of technology. It is essential that the appointee holds a PhD in the relevant field, has university teaching experience and a record of research publication in a relevant area, as well as the ability to implement equity and diversity policies and programs. It is desirable that the appointee be able to teach and conduct research in ways that bridge historical, philosophical and contemporary concerns in Science and Technology Studies. The salary range for Lecturer is AUD48,678 - 57,806 (USD30,670-36,420) and for Senior Lecturer AUD59,629 - 68,757 (USD37,570-43,320) depending on qualifications and experience. The appointment will be full time (continuing) subject to review after a probationary period. The appointee should be available to commence duties in July 1999. Candidates are advised to seek information from the School about its current teaching activities and subject listings and to take these into account in preparing their application. Candidates should include in their application a sample of their published or unpublished written work (approximately 20 pages). Membership of a University approved superannuation scheme is a condition of employment. Enquiries may be directed to Dr David Miller, Head of School on telephone (61-2) 9385 2356, email: dp.miller@unsw.edu.au or facsimile (61-2)9313 7984. Applications close 12 February 1999. Please quote Ref.: 599SHUH

The Center for History of Recent Science, in the Department of History at **The George Washington University, Washington, D.C.**, is offering *two two-year postdoctoral fellowships* to begin August 1999. "Recent science" comprises lines of research in physical or biological sciences that have been carried out for the most part by scientists who are still living. In effect, that means research done since the second world war. Work in history of recent science poses novel historiographical problems, notably the use of interviews and their integration with the more traditional materials of

the historian. Inquiries and letters of application should be sent by March 1, 1999 to Horace Freeland Judson, Director of the Center for History of Recent Science and Research Professor of History, The George Washington University, Washington, DC 20052, USA. Application instructions are also available at: http://www.gwu.edu/~recsci/

Each year the **New York Academy of Medicine** offers the Paul Klemperer Fellowship and the Audrey and William H. Helfand Fellowship to support work in history and the humanities as they relate to medicine, the biomedical sciences, and health. The Klemperer Fellowship supports research using the Academy Library as an historical resource. It is intended specifically for a scholar in residence in the collections of the Academy Library.

The Helfand Fellowship more broadly supports work in the humanities, including both creative projects dealing with health and the medical enterprise, and scholarly research in a humanistic discipline as applied to medicine and health. Although residence is not obligatory, preference in the selection process will be given applicants whose projects require use of the resources of the Academy Library and who plan to spend time at the Academy. The Academy maintains one of the largest medical libraries in the United States with a collection of more than 700,000 volumes, 275,000 portraits and illustrations and 183,000 pamphlets. The Historical Collections Department contains 50,000 volumes in the history of medicine, science and other health-related disciplines. Of these, rare materials dating from 1700 B.C. to the twentieth century number approximately 32,000 volumes. Especially well represented are medical Americana and classic works in the history of Western European medicine and public health. Primary source materials include more than 2,000 manuscripts, most notably the Edwin Smith Surgical Papyrus, along with photographs and medical artifacts. Secondary sources include an extensive history of medicine reference collection and 95 current journal subscriptions in the history of the health sciences. Besides the Academy's own archives, the collection also houses the archives of many health-related institutions and organizations, which serve as a primary resource for the history of health administration, public health, medical education, and medical practice in New York. The general collections of the Library include one of the world's largest collections of literature on clinical medicine for the nineteenth and first half of the twentieth century The New York Academy of Medicine is a not-for-profit educational institution established in 1847 to enhance the health of the public.

The Helfand Fellowship and the Klemperer Fellowship each provide stipendsof up to $5,000 to support travel, lodging and incidental expenses for a flexible period between June 1, 1999 and December 31, 1999. Besides completing research or a creative project, each Fellow will be expected to make a presentation at the Academy and submit a final report on the project. We invite applications from anyone - regardless of citizenship, academic discipline, or academic status - who wishes to use the Academy's collections for historical research or for a scholarly or creative project in the medical humanities. Preference will be given to (1) those who show the need to use resources that are uniquely available at the Academy, and (2) scholars or creative artists in the early stages of their careers. Applicants may compete for either the Klemperer or the Helfand Fellowship, but not both. These fellowships are awarded directly to the individual applicant and not to the institution where he or she may normally be employed. None of the fellowship money is to be used for institutional overhead. Applications must be received by the Academy by February 1, 1999; candidates will be informed of the results by May 15, 1999. Requests for application forms or further information should be addressed to: Office of the Associate Librarian for Historical Collections and Programs, New York Academy of Medicine, 1216 Fifth Avenue, New York, NY 10029. Email: history@nyam.org. Telephone: 212-822-7314.

The Centre for Medical History and the **University of Exeter** Foundation offer *two scholarships in medical history*: one for two years and one for three years, with supervision and University fees paid and with an allowance for subsistence at rates similar to those offered by the British Academy and the Economic and Social Research Council. The successful applicants may take up their scholarship at any point in the academic year 1998-99. Proposals for research in any area of medical history will be considered, though preference may be given to candidates wishing to work in areas where the Centre staff have an expertise. For further details about the Centre and the areas in which supervision may be offered please write, preferably by email, to the director, Joseph Melling, Centre for Medical History, University of Exeter, Exeter EX4 4RJ, UK, Phone: 01392 263297 or 263289 (ansaphone) or 263304 (messages), Fax: 01392 263297 or 263305, Email: J.L.Melling@ex.ac.uk.

The Department of Urban Affairs and Planning (UAP) at **Virginia Tech** seeks to fill up to three tenure-track positions in August 1999 at the assistant or associate professor levels. Candidates should have a Ph.D. in planning, public policy, or related fields and demonstrate achievement or potential for excellence. The department welcomes expertise in one or more of four areas: (1) environmental planning and policy, (2) international development, (3) collaborative processes (partnership building, participatory planning and policy-making), and (4) information technologies as they relate to urban planning and public policy. Professional experience is highly desirable. Application review will begin December 1, 1998 and continue until the positions are filled. Direct an application letter that specifies area of interest and expertise, including a vitae and a list of four references, to: John Randolph, Head, Urban Affairs and Planning (0113), 201 Architecture Annex, Virginia Tech Blacksburg, VA 24061, USA Tel: 1-540-231-6971; fax 1- 540- 2313367 energy@vt.edu. For information on Virginia Tech and the Department's five degree programs, see http://www.vt.edu and http://www.arch.vt.edu/CAUS/UA/

The **John Templeton Foundation** is pleased to announce a competition for six $100,000 awards to support sabbatical research and writing on the constructive interface between science and religion in the 21st century. Applications are encouraged from talented, research-focused, writers representing any and all religious traditions, as well as non-religious thinkers. Successful applicants will have demonstrated skills in research and writing, exemplifying engaged, well-informed discourse, balanced inquiry, and a humble approach to learning. This awards competition seeks to stimulate outstanding research, writing, and publishing in the broad field of science and religion. For further information, go to <http://www.templeton.org/book-rfp> or send email to <book-rfp@templeton.org>. Letters of Inquiry should be sent to: Book RFP, John Templeton Foundation, 100 Matsonford Rd., Suite 100, Radnor, PA 19087, USA.

Applicants from all areas of philosophy are encouraged to apply for the lectureship in the Department of Philosophy at Monash University, Australia. Competence in metaphysics, epistemology and environmental ethics will be an advantage. The Appointee will be required to teach using a resource-based teaching program and by flexible delivery mode. Appointees may be required to teach from time to time at various campuses other than the Clayton Campus where the Philosophy Department is situated. Enquiries to Professor John Bigelow (Phone: 9905 3201, Fax: 9905 3206 email: John.Bigelow@arts.monash.edu.au).

The Program in History and Philosophy of Science and the Division of Mechanics and Computation of the Stanford School of Engineering announces the Timoshenko Fellowship. The Timoshenko Fellowship is a graduate student fellowship for a student interested in pursuing a dissertation in the history of engineering in biomedicine, particularly areas related to engineering mechanics in medicine and biology, medical device design, physiologic modeling, disease research, modern developments in medical imaging, computers in biomedicine, and medical simulation and treatment planning. Students should have a strong background in science and engineering. Candidates having a BS in mechanical engineering or computer science are especially encouraged to apply. The course of graduate study will be designed in consultation with faculty from Engineering, Medicine, and the History of Science and Technology, and will include a spectrum of courses in the history of technology, in science and technology studies, and further work in science and engineering fields appropriate to the dissertation topic and background of the student. The Timoshenko Fellow will work closely with faculty in both the History of Science and Engineering. Persons interested in applying should write to Gertrud Pacheco, Department of History, Lane History Building, Stanford University, Stanford, CA 94305-2024 by February 5, 1999.