University College Maastricht
Course HUM2046
2017/2018

LIVING IN A TECHNOLOGICAL CULTURE
Introduction in Science and Technology Studies




CONTENTS

1. COURSE INFORMATION

COURSE CONTENT

"We can't solve problems by using the same kind of thinking we used when we created them."

These words of Albert Einstein are more than ever, valid today. The complexities of today's societies and the relations among them are multiple and not easy to deal with. Einstein's plea to look at them in a different way is exactly what this course is about. It aims to transform your perspective on the world so that you notice that the 'stuff of the world' can be reflected on in new ways, which offer opportunities for interventions and passageways for improvement. After all, making a difference requires more than the power to act: it requires to think in new ways, to think out of the box. And that is exactly what we want to teach you in this course.

This course offers an introduction to Science and Technology Studies (STS). It will introduce you to the multiple ways in which science and technology, individuals and institutions mutually shape one another to the benefit and sometimes detriment of society. In this course, we take a "critical" approach to science and engineering. By this, we don't mean being negative about science nor technology. But similar to the balanced viewpoints we expect from good movie critics, we will focus on developing your ability to judge the good and bad aspects of science and technology.

While modern culture relies heavily on sophisticated instruments, techniques, and systems, most people think that the actual making of science and technology is the exclusive domain of scientists, inventors, engineers, and technicians, people who are fascinated by "how things work" and "making things work". Those not directly involved in the design or development of science and technology ("users" or "consumers") are thought to have little interest in the facts, materials, principles, or procedures found in the world of scientists and technicians. The only thing they seem to care about is the use of the scientific output and technology. However, people who do not spend much thought on the making of science and technology commonly do not merit its use serious reflection either. Once things have been made or discovered, our interaction with them is understood to be a straightforward matter. We pick up our mobile phone, make some funny pictures with it, listen to music, twitter some details about what we do and where we are and chat with our friends. We board an airplane, fly from point A to point B, and then we get off the airplane. Although we are surrounded by the results of scientific endeavour and technologies of various kinds, they have become almost invisible and we take them for granted.

In this course we challenge "common sense" views of the relationship between science and technology, and society. Science and technology shape culture. The shaping influence of science, for example, ranges from its inspiration for 20th century avant-garde movements to its impact on our dominant values and metaphors (our brain as our internal 'memory stick'). Technology and science shape society, from the shaping of mobility patterns and gender and sexual identities, to the standardisation of practices in health care. Mobile phones have changed what it means 'to be alone'; organ transplantation has redefined our understanding of life; 'scientific planning' has reshaped our policy-making practices. Technologies do not merely assist us in our everyday lives;

they are also powerful forces acting to reshape our activities and their meanings. The introduction of a robot in an industrial workplace not only increases productivity, but, often, radically changes the process of production, redefining what "work" means in that setting. When a sophisticated new technique or instrument is adopted in medical practice, it transforms not only what doctors do, but also the way people think about health, illness and medical care.

There is, *vice versa*, a *cultural influence* on science and technology too. Thus we can only hope to understand science and technology when we acknowledge their socio-cultural base. Historical and comparative studies have shown how different socio-cultural circumstances yield very different forms and contents of science and technology. This applies at the highest level of aggregation, when we compare, for example, Chinese with western science and technology. It also applies at the level of scientific statements, technological systems, and artefacts. Facts and artefacts are, for example, gendered like all other phenomena. And the conception of causality in quantum theory has been shown to mirror the cultural atmosphere in Weimar Germany, while the high-wheeled bicycle was shaped by the macho culture of 'young men of means and nerve.'
Science and technology are, finally, also *cultures themselves*. Recent work in the history and sociology of science and technology has shown how fruitful it can be to look at scientific experimentation, fieldwork, technical workshops, laboratories, and international scientific cooperation as cultural phenomena. The analysis of dominant norms and values, of main and secondary goals, of practices, and of tacit knowledge has yielded insight into characteristics of both the content and the production process of scientific knowledge and technical artefacts.

Besides different ways to reflect on the relationship between society, science and technology, this course will also provide you with some applications of STS-reasoning in different domains: human enhancement, our digital environment, developments studies, and risk studies as well as some examples of STS-methodology (SCOT and Actor Network Theory).

COURSE OBJECTIVES

After completion of this course students are able:

- to explain different perspectives on the relationship between society, science and technology
- to explain the differences between technological determinism and the Science and Technology Studies (STS) approach
- to explain the methodological approaches in STS such as SCOT and Actor-Network Theory
- to recognize, explain and apply the basic principles of STS-reasoning to today's societal concerns such as genetic engineering, human enhancement, and vulnerable infrastructures.

INSTRUCTIONAL FORMAT

The course aims to introduce you to central conceptualizations of the relationship between society, technology and science. To achieve these aims the core teaching of the course is done in three types of activities: perspective lectures, reflective sessions and student presentations:

***Lectures*:** The lectures provide essential background information on the topics discussed during the seminars. You are encouraged to participate actively by asking questions. Important: lectures are considered as an essential part of the course and therefore attendance is required.

Seminars: During the seminars (tutorial meetings) we will discuss the key questions as formulated in the course book and related to the compulsory readings of the seminar. Besides the compulsory readings, the course book also provides additional readings that can be helpful for further research into the topic. All seminars will be chaired by the tutor.

Student presentations: You will carry out a small-scale research projects as part of a seminar (7) and exam (midterm) in which a number of key themes are covered. These presentations are prepared and presented as a team. The results of these projects are discussed in a seminar.

READINGS

Beware: Most readings can be found in the **E-reader**. But some of the readings (marked with **Study Hall (= Study-landscape in the university library)**) are positioned in the Arts and Culture Study Hall of the inner city library. Others can be found on the **Student Portal** in the folder: '**readings',** or in the **E-journal** section of the library or are available as **E-book.**

PRACTICAL INFORMATION

Course coordinator and tutor

Dr. ir. Annelies Jacobs
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2. EXAMINATION

GRADING POLICY

This course will be evaluated on basis of three parts:

1. Participation in tutorials: 30% of your final grade
2. Midterm- exam: 20% of your final grade
3. Final exam: 50% of your final grade.

Beware: in order to pass you have to pass your final exam.

CLASS PARTICIPATION AND ATTENDANCE

Social knowledge differs from technical knowledge in that it requires active engagement and participation. Class participation is an important component of your grade. Attendance in class does not constitute class participation. Emphasis will be placed on your individual contribution to the quality of class discussion in plenary and section, and your contributions to other aspects of the course.

Rules considering participation in this course:

You are expected to be well prepared (meaning: read all the compulsory readings and prepare all assignments) and contribute actively to the discussions in the seminar in a relevant way. If your participation is above or below this standard it will be clearly reflected in the grading. The tutor will mark your participation after every seminar. After the midterm exam you will be informed about your overall participation.

Rules considering attendance in this course

As a matter of policy, attendance is required in all seminars and lectures. UCM has a compulsory attendance requirement for all courses, skills and projects. The minimum attendance requirement is 85%. Meaning you can miss two meetings without any consequences. For each additional meeting you miss, you have to submit an additional assignment. Missing five meetings results in a fail.

Therefore, the tutor has to register your attendance in tutorial groups. **Beware: in this course there is also an attendance requirement for lectures.**

Exams have a 100% attendance requirement. If you do not show up for your midterm exam without notifying the course coordinator and the Examination Committee beforehand, you will automatically fail the course.

It is essential that you do not disturb the seminars and lectures by coming in late. This course will strictly adhere to the attendance requirement. If you misses more than 30% of the group meetings, you will automatically fails the course.

Additional assignment
If you do not meet the attendance requirement, but have not missed more than 30% of the meetings, you will be given a provisional overall grade, but will not receive credits for the course until you have successfully completed an additional assignment.
To qualify for an additional assignment you may not have missed more than 30% of the meetings and must submit a completed request form 'additional assignment because of insufficient attendance' to the Office of Student Affairs, within 10 working days after completion of the course. After collecting and checking all the forms, the Office of Student Affairs will send the request forms to the coordinator of this course. The coordinator of the course will decide on the validity of the reason(s) given. It is up to the coordinator to decide if any absence is justified by the reason given. If the coordinator decides that you had a valid reason for not complying with the attendance requirement, you will be given an additional assignment.

The nature and volume of the additional assignment will be proportional to the number of meetings missed. You must complete and submit the assignment within 20 working days. If you receive a pass for the additional assignment it will be regarded as having met the attendance requirement and your provisional final grade will be declared valid. If the coordinator decides that the reasons for absence were not valid, and/or if additional meetings have been missed, no additional assignment will be given and the provisional grade given for the course will be annulled, which will result in a fail for the course. The coordinator will inform the Examination Committee about your successful completion of the extra assignment or your failure to successfully complete the extra assignment.

Sickness or Absence:
According to the UCM rules you are required to inform the Office of Student Affairs via e-mail in cases of sickness or absence lasting longer than 8 consecutive days. See for details: UCM Student Handbook.

MIDTERM EXAM (October 3, 2016)
You will act as a team and present a thorough analysis of one of the episodes (safe the first) of *Black Mirror,* a British television anthology series that shows the dark side of life and technology. The series taps into our contemporary unease about our modern world", with the stories having a "techno-paranoia" feel. Each episode has a different cast, a different setting, even a different reality. But they're all about the way we live now – and the way we might be living in 10 minutes' time if we're clumsy.

Use the episode to reflect on, for example, a particular issue, a particular debate or ideology, a particular shaping process on society, science and technology. Use your own experience, interests, knowledge and creativity to come up with an interesting reflection on the episode while using an STS perspective. As a group you should be able to explain and link your topic to a number of STS theoretical concepts, approaches or principles. The presentation involves 20 minutes. This is not that much time to make your point, so serious preparation is advised, as time management will be a part of the grading. Use of

PowerPoint is recommended, but not mandatory. Each presentation will be followed by a 10 minutes discussion. Before the presentation you deliver a hand out to the examiner. The hard copy should include a list of references.

Evaluation criteria:

- interesting angle & view on the topic
- clear relation between theoretical concepts and topic
- good representation of the literature
- relevancy of the topic in relation to the theme
- attractive presentation
- structured
- clear messages and conclusions
- time management
- good (Powerpoint) slides, if used
- hand out available before presentation

FINAL EXAM (Deadline October 20, 2017 5PM)

You have to submit a paper of 3000 words (excluding literature list and footnotes; line spacing 1,5, APA referencing style). You are free to choose a topic yourself. This topic should be clearly related to the issues that are discussed in class and firmly intertwined with the theoretical concepts that are dealt with in the literature/lectures.

Guidelines for writing the paper

Your paper should at least include the following information:

1. An introduction.
2. Your main argument.
3. Conclusions
4. List of references

The essay will be assessed on basis of the following criteria:

- Demonstration of your understanding of the themes and theories discussed in the course.
- Evidence of critical reflection.
- Your ability to structure and present your thoughts clearly.
- Your ability to integrate texts and issues, which are discussed during the course with your topic.
- Your ability to explain your argument.
- Use of academic papers

GRADING

The assessment is reflected in the following grading

10-8.0 Excellent: An outstanding answer. The paper is well written, logical and clear. It contains evidence of a wide knowledge of the subject matter. It combines a good understanding of theoretical issues and empirical applications, with some originality of

approach. The paper presents ideas that are logically developed and carefully formulated. Its arguments are clear and accurate. The use of concepts, theories or research findings is precise and accurate. The paper builds from current theory and empirical work to reflect originality and insight in the student's thinking and analysis.

7.9-7.0 Good: A reasonably comprehensive and well-organized answer. The argument presented is clear and logical, with evidence of having understood the issues and an ability to think about them effectively. The paper states ideas and develops its topic clearly, logically and adequately. Its ideas are supported with arguments that are clear and accurate. Its use of concepts, theories or research findings is largely precise, although there may be a few minor factual errors or inaccuracies.

6.9-6.0 Satisfactory: This mark reflects a paper that is adequately organized and a full answer to the question. It is mostly accurate, but limited in scope and does not express any real development of argument. The paper is a satisfactory response to the assignment. Its central ideas are expressed and developed clearly enough to be understood by the reader. Although the paper may seem correct, it lacks the originality and clarity of thought that would entitle it to an above average grade. The use of concepts, theories or research findings may reflect more than minor inaccuracies, such as basic factual errors or errors of omission. It shows some grasp of theory and its relation to empirical data, but with little insight or grasp of wider issues.

5.9-5.5 Pass: This paper shows evidence of course reading, but it is deficient in organization and scope. The information it contains is insufficient. The paper indicates below average achievement in the development of its ideas, which may be unclear or supported illogically or inconsistently. Its use of concepts, theories or research may contain errors, omissions and irrelevancies. It shows no grasp of theory and its relation to empirical data, and it has little insight or grasp of wider issues.

5.4-0.0 Fail: This paper shows little evidence of course reading, it is deficient in organization and scope. Its ideas are poorly developed and are not sufficiently supported. It may also contain numerous errors, omissions and irrelevancies.

Submission:
You are required to turn your paper in as a soft copy via Safe Assignment on the Student Portal (Safe Assignment checks for plagiarism). Additionally you have to hand in a hard copy as well. You can turn your paper in at the Office of Student Affairs mailbox located in the green area.

Deadline: 5PM
Beware: an electronic deadline will be set in Safe Assignment in the Student Portal. This prevents you from handing in your work later than the set deadline. (However, it does not prevent you from handing in the work earlier!)

Re-sit
If the paper is marked with an insufficient grade (lower than 5.5), you have a second opportunity in the re-examination period.

In order to be eligible for a re-sit examination, you must have met the attendance requirement for this course or be allowed to make up for it by means of an additional assignment. You must also have made a fair attempt to do all the parts of the assessment

for the course, unless there are pressing reasons that prevented you from doing so and you have notified the course coordinator and Examination beforehand.

If you fail the midterm, you have no possibility to re-present your project. In other words, there is no re-sit for the midterm. If you fail the final exam, you have to revise your paper and resubmit it within the allowed timeframe.

If you pass the course you are not allowed to take a re-sit in order to improve your grade.

Plagiarism
The UCM Student Handbook provides detailed rules on plagiarism. Plagiarism is defined as fraud (Article 5.7 of chapter 4.1). Article 11 provides a Directive on Fraud (contained in chapter 4.2 of the UCM Student Handbook). In case it is suspected that you have committed plagiarism, the course coordinator will inform the Examination Committee. It is up to the Examination Committee to decide whether you have indeed plagiarized, in which case there will be consequences for you (See Academic Rules and Regulations, Chapter 4.2, Section 5 of the UCM Student Handbook). See for further details: the Student Handbook on plagiarism.

3. COURSE SCHEDULE

COURSE STRUCTURE

Seminar 1: White Heat: Picture Perfect
Seminar 2: Utopian and Dystopian Visions of the Future
Seminar 3: Science and Technology Shaping Society?
Seminar 4: Interrelations between Science, Technology and Society
Seminar 5: The Gene Revolution
Seminar 6: The Politics of Artifacts
Seminar 7: Human Enhancement
Seminar 8: Actor Network Theory
Seminar 9: The Vulnerability of Technological Culture
Seminar 10: Peer review

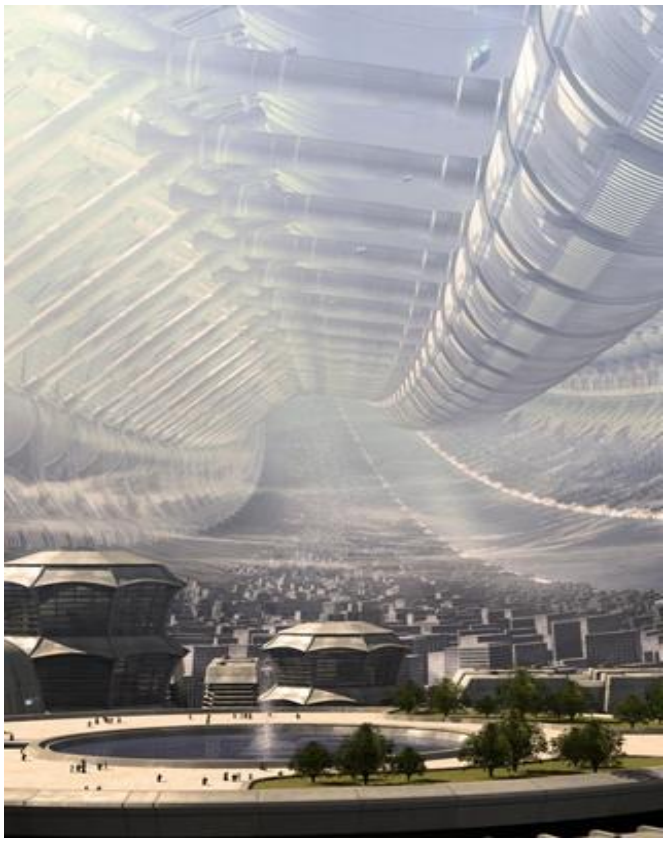
Lecture: Introduction to the course – Dr. Annelies Jacobs
Lecture: Basic principles of Science and Technology Studies – Dr. Jessica Mesman
Lecture: STS and the Global South – Dr. Ragna Zeiss
Lecture: NEST ethics – Prof. Tjalling Swierstra
Lecture: Actor Network Theory – Dr. Darryl Cressman

Week	Type of meeting	Topic / objective	Assignments
Week 1 Sept. 5 - 8	Lecture 1 2 tutor group meetings	- Introduction to the course - 'White Heat' - Utopian and dystopian visions of the future	A. Jacobs Seminar 1 Seminar 2
Week 2 Sept. 12 - 15	Lecture 2 2 tutor group meetings	- The basic principles of Science and Technology Studies - Science and technology shaping society? - Science and Technology Studies	J. Mesman Seminar 3 Seminar 4
Week 3 Sept. 19 - 22	Lecture 3 2 tutor group meetings	- STS and the Global South - The gene revolution - The politics of artefacts	R. Zeiss Seminar 5 Seminar 6

Week 4 Sept. 26 - 29	Lecture 4 1 tutor group meeting	- NEST ethics - Human enhancement	T. Swierstra Seminar 7
Week 5 Oct. 3 - 6	Student presentations 1 tutor group meeting	- Presentations - Actor Network Theory	Midterm Seminar 8
Week 6 Oct. 10-13	Lecture 5 2 tutor group meetings	- Actor Network Theory - Vulnerability of technological culture - Peer review	D. Cressman Seminar 9 Seminar 10
Week 7 Oct.17-20	No meetings	- Preparation exam	Exam
Week 8	Reflection week		

4. SEMINAR DESCRIPTION

SEMINAR 1: WHITE HEAT: PICTURE PERFECT



A Coca-Cola bottle, a Samurai sword, a Rolls-Royce, and a prehistoric stone tool are linked not only because they are projects of technology, but also because each is a symbol invested with meaning," writes historian Carroll Pursell. His adventurous and timely book takes the reader on a tour through history and around the lives, showing what machines can tell us about the world we want to have. *White Heat,* a documentary, explores a range of themes: technology's effect on our perceptions of time and space; its role in mass production theories that turn workers into interchangeable parts; its sanitizing of warfare with "smart" weapons that kill more people more quickly; and the psychological and social implications of the "information age." Pursell demonstrates these themes with absorbing anecdotes and provocative questions. How was the nineteenth-century boom in soap manufacturing related to standards of social morality? How does voice-mail encode certain cultural assumptions about gender and class? In revealing the ways that technological developments embody myth, ritual, and fantasies, Pursell shows that technology is as culturally specific, and as culturally illuminating, as art, literature, or any other work of the human imagination. Accessible and lively, with tales of quirks and mishaps, *White Heat,* is for anyone caught up in our beeping, roaring, technologized world.

This video presents several themes regarding the relationship between science, technology and society, the idea of progress, utopia, dystopia, and several visions of the future. However, the video was made in the 90s. Since then the world has changed dramatically (or not?). **Try to link the presented themes to today's world and today's technologies. We will discuss them in class.**

SEMINAR 2

UTOPIAN AND DYSTOPIAN VISIONS OF THE FUTURE

H.G. Wells

In H.G. Wells' novel *Men like Gods* (1923) a few Englishmen are accidentally transported to the parallel world of Utopia. Utopia is like an advanced Earth, although it had been quite similar to Earth in the past in a period known to Utopians as the "Days of Confusion." Utopia is a utopian world: it has a utopian socialist world government, advanced science, and even germs have been eliminated and predators are almost tamed.

Utopias are set in the future, when it is believed that advanced science and technology will allow utopian living standards; for example, the absence of death and suffering; changes in human nature and the human condition. These utopian societies tend to change what "human" is all about. Technology has affected the way humans have lived to such an extent that normal functions, like sleep, eating or even reproduction, has been replaced by an artificial means. Other kinds of this utopia envisioned, include a society where humans have struck a balance with technology and it is merely used to enhance the human living condition (e.g. Star Trek).

Aldous Huxley

Wells' optimistic vision of the future gave Aldous Huxley the idea to begin writing a parody of the novel, which became *Brave New World*. *Brave New World* (1932) anticipates developments in reproductive technology, biological engineering, and sleep-learning that combine to change society. Contrary to the most popular optimist utopian novels of the time, Huxley sought to provide a frightening vision of the future. Huxley referred to *Brave New World* as a "negative utopia". The world the novel describes is a dystopia, presented satirically: humanity lives in a carefree, healthy, and technologically advanced society; however, art, science, religion, and all other forms of human expression have been sacrificed to create this "Brave New World". Warfare and poverty have been eliminated and everyone is permanently happy due to government-provided conditioning and drugs. The irony is that all of these things have been achieved by eliminating many things that humans consider to be central to their identity - family, culture, art, literature, science, religion and philosophy. As a critique of technological society, the book sketches a dystopian perspective on science and technology. A dystopian society is a state in

which the conditions of life are extremely bad, characterized by human misery, poverty, oppression, violence, disease, and/or pollution.

Jacque Ellul
Besides novelists, also philosophers of technology, like the French philosopher Jacque Ellul, present dystopian ideas of technology. In his book *The Technological Society* (1964) Ellul argues it is the technological society that modern-day humans generally hold sacred. Ellul defined technique as "the totality of methods rationally arrived at, and having absolute efficiency (for a given stage of development) in every field of human activity". Thus, it is not the society of machines as such, but the society of "efficient techniques" which is the focus of Ellul's sociological analysis: Modern technology has become a total phenomenon for civilization, the defining force of a new social order in which efficiency is no longer an option but a necessity imposed on all human activity.

The Unabomber
The general theme of dystopian society was also addressed, but in an aggressive way, by Theodore Kaczynski, also known as the Unabomber ("UNiversity and Airline BOMber). From 1978 to 1995, he sent bombs to targets including universities and airlines, killing three people and wounding 23. In 1995, Kaczynski sent a letter to *The New York Times*, promising "to desist from terrorism" if *The New York Times* would publish his manifesto '*Industrial Society and its Future*'. In this Manifesto he argued that his actions were an extreme but necessary tactic to attract attention to the erosion of human freedom necessitated by modern technologies requiring large-scale organization. He claims that scientific research is a surrogate activity for scientists, and that for this reason "science marches on blindly, without regard to the real welfare of the human race or to any other standard, obedient only to the psychological needs of the scientists and of the government officials and corporation executives who provide the funds for research." The Unabomber was the target of one of the most expensive investigations in the FBI's history. Despite the FBI's efforts, he was not caught as a result of this investigation. Instead, his brother recognized the manifesto and turned him in.

Whereas Wells presents a positive perspective on science and technology, Huxley, Ellul and Kaczynski are examples of those who foreground the negative impacts of it. In this seminar we will discuss these two perspectives on science and technology. As a preparation for the seminar you have to watch a video at home and prepare the following questions:

Assignment

1. **Before you read the readings,** give a short description of your personal ideas about A) what 'science' is; B) what 'progress' means; C) the role of science and technology in our society in general. D) Describe what the societal consequences have been of the development of for example social media.
2. Watch two Ted Talk by Ray Kurzweil 'the acceleration power of technology' from February 2005 in which he explains his project: http://www.ted.com/talks/ray_kurzweil_on_how_technology_will_transform_us Also watch a more recent Ted Talk of Kurzweil (2014): 'Get ready for hybrid thinking'
3. http://www.ted.com/talks/ray_kurzweil_get_ready_for_hybrid_thinking

4. Read the Executive Summary and Chapter 4 of the Rathenau report '*Future Man – No Future Man*: connecting the technological, cultural and political dots of human enhancement.
5. Summarize the position of Kurzweil and the postion of the Rathenau report. In what way are they different and/or similar?
6. Explain and reflect on progress and its ethics by using the videos of Kurzweil and the report of the *Rathenau Institute.*
7. Try to position yourself in this discussion. Which one do you prefer and give a substantial list of arguments for your choice? These arguments should be related to the literature you read as preparation for this seminar.

Reading:

Est, R. van, Klaassen, P., Schuijff, M., and Smit, M.
(2008) Executive Summary. In: *Future Man – No Future Man: connecting the technological, cultural and political dots of human enhancement.* The Hague, Rathenau Institute. Pp 4-5.
https://www.rathenau.nl/en/publication/future-man-no-future-man

Est, R. van, Klaassen, P., Schuijff, M., and Smit, M.
(2008) Four small stories. In: *Future Man – No Future Man: connecting the technological, cultural and political dots of human enhancement*. The Hague, Rathenau Institute. Pp 24-42.
https://www.rathenau.nl/en/publication/future-man-no-future-man

Additional videos:
Ted Talk: 'A university to the coming singularity' by Ray Kurzweil in2009
http://www.ted.com/talks/ray_kurzweil_announces_singularity_university#t-41213

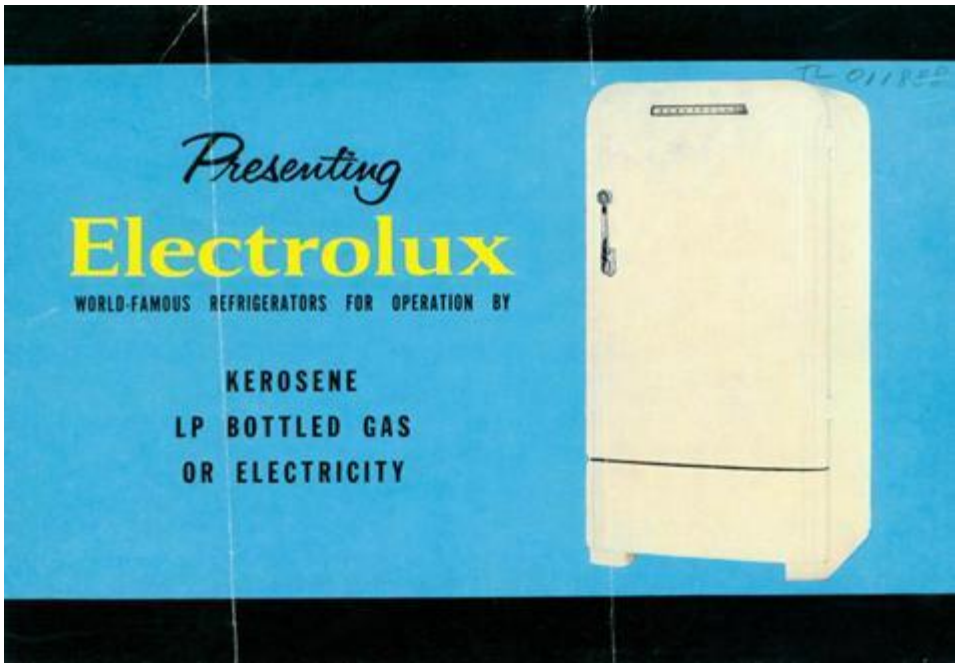
The Websites of Ray Kurzweil:
http://www.kurzweiltech.com/ktihome.html
http://www.kurzweilai.net/google-io-2014

Additional reading:
Dusek, V.
(2006). Autonomous Technology. In *Philosophy of Technology: an introduction*. (pp. 105-111). Blackwell Publishing. (Study hall)
Eckersley, Richard
(2006) Techno-Utopia and Human Values. *The Futurist*, 40(2): 48. (e-reader)
Est, R. van, with assistance of V. Rerimassie, I . van Keulen & G. Dorren
(2014) *Intimate technology: The battle for our body and behaviour*. The Hague, Rathenau Institute.
Est van, R. et al.,
(2014) *From Bio to NBIC convergence – From Medical Practice to Daily Life*. Report written for the Council of Europe, Committee on Bioethics, The Hague, Rathenau Instituut
Grossman, Terry
(2006) Ray Kurzweil's plan for Cheating Death. *The Futurist*, 40(2): 41. (e-reader)
Joy, B.
(2006). Why the Future does not need us. In, A. Teich (Ed.), *Technology and the Future* (pp. 115-136). New York: St. Martin's Press 10th ed. (e-reader)

Kurzweil, R.
(2001) Promise and Peril: a response to Bill Joy's Wired article Why the Future Doesn't Need Us.. Published on KurzweilAI.net April 9, 2001. (e-reader)
Kurzweil, R
(2001) Promise and Peril. In: KurzweilAI.net, April 9, 2001
http://www.kurzweilai.net/promise-and-peril
Kurzweil, R.
(2006). Promise and Peril. In A. Teich (Ed.), *Technology and the Future* (pp. 144-165). New York: St. Martin's Press, 10th ed. (e-reader)
Kurzweil, Ray
(2006) Reinventing Humanity: the future of machine-human intelligence. *The Futurist*, 40(2): 39-46. (e-reader)
Marx, L.
(2000). Does improved technology means progress? In, A. Teich (Ed.), *Technology and the Future* (pp. 3-12). New York: St. Martin's Press. (Library depot)
Pearson, Ian & Neild, Ian
(2006) A Timeline for Technology: to the year 2030 and beyond. Ray Kurzweil's plan for Cheating Death. *The Futurist*, 40(2): 31-36. (e-reader)
Seely Brown, J., & Duguid, P.
(2006). A response to Bill Joy and the Doom-and-Gloom Technofuturists. In A. Teich (Ed.), *Technology and the Future* (pp. 138-143). New York: St. Martin's Press, 10th ed. (e-reader)

SEMINAR 3

SCIENCE AND TECHNOLOGY SHAPING SOCIETY?



> 'A sense of technology's power as a crucial agent of change has a prominent place in the culture of modernity. It belongs to the body of widely shared tacit knowledge that is more likely to be acquired by direct experience than by the transmittal of explicit ideas. Anyone who has witnessed the advent of the computer, for example, knows a great deal about how new technology can alter the very texture of daily life, and has gained this understanding as more than a bystander. Even those who do not use computers have had to accommodate their ways to some of its requirements in supermarkets, post offices, banks, libraries, schools, airlines etc. But of course the computer is only one of the radically new science-based technologies - along with television, jet aircraft, nuclear weaponry, antibiotics, the contraceptive pill, organ transplants, and biogenetic engineering – whose transformative power has been experienced by millions alive today.' (Source: Smith & Marx, 1994, ix-x)

In this seminar we will discuss the notion of 'technological determinism'. Some people consider technological development a process animated by an inherent force. It seems to feed on it self, growing ever larger and gathering increasing momentum. Moreover, that growth and impetus seem unstoppable and irreversible. Others, however, reject this notion of technology. They see the process of technological change as proceeding along a path chosen consciously and more or less rationally by human beings. This approach presents technology as neutral. Therefore it provides a different explanation of technological development.

The aim of this seminar is to introduce ideas about the way in which science and technology shape society. Therefore we investigate the notion of technological determinism and how it is criticized.

Assignment

1. What is the central idea of the perspective of technological determinism?

2. A) On what grounds is technological determinism criticized? B) List and explain the different shaping forces as described by Mackenzie and Wajcman.

3. Explain these different points of critique by using the case study of the refrigerator and the introductory essay of MacKenzie and Wajcman.

Readings

Mackenzie, Donald & Judie Wajcman (eds.)
(1999). Introductory Essay: The social shaping of technology. In: *The Social Shaping of Technology*. Mackenzie, Donald & Judie Wajcman (eds.) Open Univ. Press, 2nd ed., pp. 3-**16.** (Student Portal) (**Be aware**: you are allowed, but not obliged to read the whole chapter)

Schwartz Cowan, Ruth
(1985). How the refrigerator got its hum. In: *The Social Shaping of Technology . How the refrigerator got its hum*. Mackenzie, Donald & Judie Wajcman (eds.) Open Univ. Press, **1st** ed., pp. 202-219. (Student Portal)

SEMINAR 4

INTERRELATIONS BETWEEN SCIENCE, TECHNOLOGY AND SOCIETY

The technological determinist image of technology and science was replaced by another form of determinism: "social determinism", in which technological innovation is seen as socially determined, shaped by political, economical, and cultural values.
Emerging as a critique of the technological deterministic approach, such views have often gone too far: science and technology appeared as mere social products, simply neutral tools subject to manipulation and control by social actors.

In this sense, both approaches are reductionist in their own way. Nowadays, research in the field of science and technology has moved towards a different interpretation of the science-technology-society relationship. This third *perspective "Interrelations between Science, Technology and Society"* can be considered the result of the search for a new, more adequate image of the science-technology-society relationship. It asserts that science and technology are socio-technical processes. It is not the impact of science and technology on society, nor the impact of society on science and technology that is underlined, but the rich linkages and interrelations between them.

In 2014 the Rathenau Institute presented a detailed report on Nanotechnology, Biotechnology, Information technology and Cognitive technology (NBIC). The report discusses how the new wave of technologies may transform a variety of socio-technical practices, causing humans and technology to become increasingly entangled. As a result, the human condition is more and more becoming a techno-human condition. This implies that biological and biomedical technologies are increasingly applied in multiple ways outside the practices of professional health research and health care. This does not only raises the question whether the fora for ethical reflection and debate that are institutionally linked to the practices of professional health research and health care will be able to take up the challenge to explore the ethical issues raised by the developments outside the medical domain. The report is also a demonstration of how society and science and technology are interrelated.

Assignment
The NBIC report acts as a case study in order to understand and discuss this interrelationship between science, technology and society. Therefore you need to read chapter 3, 7, and 8 and choose one of the case studies chapter 4 (neuro perspective) or 5 (nano perspective) or 6 (info- perspective).
Try to apply the ideas of Kleinman and Wyatt (see Readings) to the case study chapter that you have selected, in order to gain an understanding of how science and technology is related to society and the different ways to think about this relationship.

Additional suggestions

1. Check out the website of Kevin Kelly (http://www.kk.org) and his ideas about 'What Technology Wants'. This offers material for discussing technological determinism (is he one of them?) and whether it makes sense to think of technology as an evolutionary force with a will of its own. Perhaps we can

actively shape this 'evolutionary force', but ultimately we only might be the mere means for its manifestation. Check out his TED talk: https://www.ted.com/talks/kevin_kelly_on_how_technology_evolves?language=en

2. Also check out "Press Pause Play", a nice documentary about the relation of technology and culture. It features long interviews from "serious" artists and it gives interesting points of view, be it from the music industry side or the artistic one. http://gizmodo.com/5875802/when-art-and-technology-and-moby-collide
3. This a link about a vision of how augmented reality might be implemented in our lives at some point. We might wonder if this improves our life: http://player.vimeo.com/video/46304267

Readings

van Est, R. et al.,
(2014) From Bio to NBIC convergence – From Medical Practice to Daily Life. Report written for the Council of Europe, Committee on Bioethics, The Hague, Rathenau Instituut
https://www.rathenau.nl/nl/publicatie/bio-nbic-convergence-medical-practice-daily-life

Kleinman, D. L.
(2005). Science is political/ technology is social: concerns, concepts and questions. In: *Science and Technology in Society: From Biotechnology to the Internet* . Oxford. Blackwell Publishing. (pp 1- 14)

Wyatt, Sally
(1998). Technology and Society- a false dichotomy. In: *Technology's Arrow: Developing Information Networks for Public Administration in Britain and the United States*. Maastricht: UPM. pp 9-24. (e-reader)

Additional readings

Bijker, Wiebe
(2001) Understanding Technological Culture through a Constructivist View of Science, Technology, and Society. In: Cutcliffe, Stephen and Carl Mitcham, eds. *Visions of STS; Counterpoints in Science, Technology and Society Studies.* SUNY Series in Science, Technology and Society. Albany: State University of New York Press. Chapter 2, pp. 19-34. (e-reader)

Johnson, D. & J.M. Wetmore
(2009) Introduction. In: *Technology and Society: Building our sociotechnical future.* Cambridge (MA): The MIT Press. pp. xi-xv.

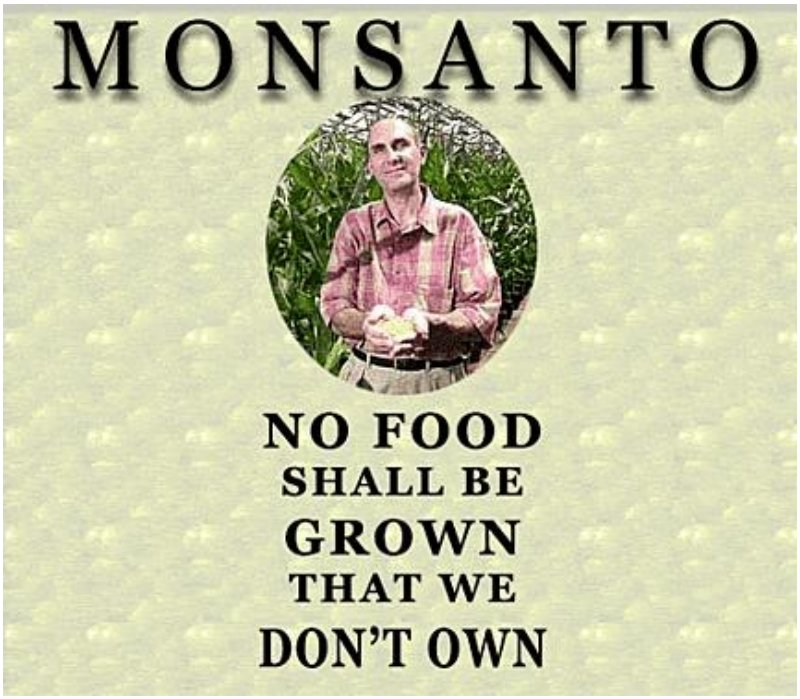
Johnson, D. & J.M. Wetmore
(2009) The relation between technology and society. In: *Technology and Society: Building our sociotechnical future.* Cambridge (MA): The MIT Press. pp. 93-95.

Michael, Mike
2006) Between technoscience and everyday life. In: *Technoscience and everyday life.* Maidenhead: Open University Press. Pp.1-15 (e-reader)

Wyatt, Sally
(1998). Technology and Society - a false dichotomy. In: *Technology's Arrow: Developing Information Networks for Public Administration in Britain and the United States*. Maastricht: UPM. pp 4-24. (e-reader)

SEMINAR 5

THE GENE REVOLUTION



The science and the technology development gap between developed and developing countries. Political independence has not meant technological independence for states in Africa, Asia and Latin America. Although some countries have made remarkable progress in certain respects (Singapore, South Africa, Cuba), most find themselves in an ever-growing technological dependence on rich countries in the North. Africa only counts for a fraction of one percentage of patents, and in Africa just two countries dominate the scene. Agricultural technology development is in crisis in many countries, leading to real and potential food insecurity. Biotechnology is almost exclusively concentrated in the North, even though ingredients of new biotechnologies may have been taken from the South. Adaptation of such technologies to the conditions of poor cultivators has hardly occurred. Yet there are cases that indicate how countries in the South can play their part in technological development.

Assignment

Watch the documentary 'The world according to Monsanto' http://topdocumentaryfilms.com/the-world-according-to-monsanto/

1. STS claims that science is not developing outside society, but within. Explain this claim by using the case of Monsanto and describe how it is related to the sphere of economics, politics, the law, the social etc.

2. Kleinman indicates different ways in which Western science practices act as a form of colonialism. Describe these ways on basis of Kleinman and the Monsanto video.
3. Explain how cultural histories and mindset influence the development of biotechnology.
4. Kleinman refers to the problem of biopiracy. A) Explain what it is. B) Which role is there for local universities, research institutes and public interest groups? C) What can multilateral donors (like the World Bank), bilateral donors (like individual rich countries in the North) or non-governmental organisations (like universities) do to assist in solving this problem the divide? D) How can the technological policy dialogue among different stakeholders best be organised?
5. Read Herring and Glover & Stone and position yourself (with arguments).

Readings

Kleinman, Daniel Lee.,

(2005) Ceding Debat: Biotechnology and Agriculture. In: *Science and Technology in Society: From Biotechnology to the Internet*. Oxford. Blackwell Publishing. Pp 15-33. (Study Hall/ reading room)

Kleinman, Daniel Lee.,

(2005) Technoscience in the Third World: the Politics of indigenous resources. In: *Science and Technology in Society: From Biotechnology to the Internet*. Oxford. Blackwell Publishing. pp69-83. (Study Hall)

Glover, D. and G. D. Stone,

(2011). "Genetically Modified Crops and the Food Crisis: Discourse and Material Impacts." Development in Practice 21(4-5): 509-516. (Student Portal)

Herring, R. J.,

(2008). "Science and society - Opposition to transgenic technologies: ideology, interests and collective action frames." Nature Reviews Genetics 9(6): 458-463. (Student Portal)

Web-based resources

Monsanto

http://www.monsanto.com/whoweare/pages/default.aspx

'The Lock'

(2013) Debunking the Anti-Monsanto/Anti-GMO claims. In the SoapBox. http://thesoapboxrantings.blogspot.nl/2013/05/debunking-anti-monsantoanti-gmo-claims.html

SEMINAR 6

THE POLITICS OF ARTIFACTS

This seminar aims to introduce you to the political dimensions of contemporary science and technology. Until recently, science and technology used to be perceived as neutral instruments of cultural, social and economic progress. The development of science and technology was a political aim in its own right, around which some kind of ideological consensus prevailed. Much effort in science and technology studies has been spent on debunking this myth of science and technology as the apolitical benefactor of mankind. Scholars in this area now seem to agree that knowledge-claims and artifacts 'have politics', in the sense that they shape and are shaped by selective and context-bounded practices, values and interests.

The North American philosopher Langdon Winner has been one of the first scholars who argued that "artifacts having politics". He used -- among other cases -- the Long Island Bridge in New York to illustrate how modern technologies have helped maintaining social power relations. His notion of 'politics' does not refer to political institutions like governments, but to power relations. This kind of politics is about inclusion and exclusion, about being more or less entitled, about having more or less rights. Winner shows how particular technologies bring along their more or less democratic or hierarchical orderings.

This seminar takes Winner's chapter on the politics of artifacts as a starting point to discuss the intricate connection between technology and politics. His conceptual distinctions and vivid examples will make us aware of the various, and often most subtle forms in which the politics of artifacts works.

Assignments

1. A) Explain the two forms in which, according to Winner, technology can be political. B) Add examples of your own (meaning: not mentioned in the text).

2. Read the first part (1-46) of the Master thesis of Kaj van Arkel about public spaces and explain what *kind* of politics the artefacts in public space have? Also explain how they *acquire* and *enact* these political qualities?

Readings

Arkel van, Kaj

(2013) *Discomfort Zones: The Technologies and Politics of Public Space*. UM Master thesis ESST 2013-2014. (Student Portal)

Winner, Langdon.

(2000, 2nd ed.). Do Artifacts have Politics? In A. Teich (Ed.), *Technology and the Future* (pp. 150-168). New York: St. Martin's Press. (E-reader)

Additional readings

Brand, R.

(2005). Urban Infrastructures and Sustainable Social Practices. *Journal of Urban Technology*, 12/2, pp. 1-25 (e-journal)

Joerges, B.

(1999). Do Politics Have Artifacts? *Social Studies of Science* 29/2, pp. 411– 431.(e-journal)

Kleinman, Daniel Lee.,

(2005) Rethinking Information Technology: Caught in the World Wide Web. In: *Science and Technology in Society: From Biotechnology to the Internet*. Oxford. Blackwell Publishing. (Study Hall/ reading room)

Woolgar, S. & Cooper, G.

(1999) Do artifacts have ambivalence? Moses' Bridges, Winner's Bridges and Other Urban Legends in S&TS. *Social Studies of Science*, 29 433-449. (E-journal)

Zadek, S.

(2001). *An independent commentary on the Digital Divide*, BT's Hot Topic, www.btplc.com / (Student Portal)

SEMINAR 7

HUMAN ENHANCEMENT

In the seventies Colonel Steve Austin is the primary protagonist of Martin Caidin's *Cyborg* series of novels and the television series spinoff of these books, *The Six Million Dollar Man*. After a near fatal military plane crash, Steve Austin became the world's first bionic man. Steve lost an eye, an arm, and both legs in the crash. All of which were replaced with bionics. Steve's legs allow him to run over 60 mph, swim at 40 mph and jump over 40 feet high. Steve's legs are also very strong and can kick any door down; he can even lift/push a car with his legs, when he kicks an object it usually is seen flying away. His legs give him amazing agility, allowing him to leap well over 30 feet horizontally. His legs are also extremely durable. Steve's arms and legs give him amazing acrobatic abilities.

Now 30 years later a bionic man is not just an SF-fantasy anymore. Australian researchers trying to re-grow damaged spinal cords with tiny bionic implants are seeing for the first time what's happening at the nano-scale. Meanwhile, philosophers working alongside the researchers say it's time to find out more about how the public feels about such bionic research, which in some cases is being used to enhance human memory, physical abilities and perception.

Researchers are also working towards repairing damaged tissue by extending bionic ear technology. The bionics program at *the ARC Centre of Excellence for Electromaterials Science* is developing flexible conducting polymers that can be implanted in the body and interact directly with living cells. The polymers can deliver electrical, mechanical or chemical messages to cells, such as nerve and muscle cells, and receive signals back. Dr Michael Higgins and colleagues are packing the polymers with cell growth factors and using them to encourage nerve cells to grow in the lab. When an electrical stimulus is applied to the polymers they pulsate and slowly release the chemicals. Both the mechanical movement

itself and the chemicals it releases can help cells to grow but it's not yet clear how exactly this works. To explore this, Higgins has been using an atomic force microscope to take a nanoscale look at what's happening. This means he can look in unprecedented detail at the real-time interaction between the polymer and the proteins and receptors on the surface of nerve cell to understand how best to make them communicate with each other. Higgins says the polymers could be used as a generic interface for a range of bionic applications.

Human enhancement research is not only related to health care, but also to university practices (especially during exam periods), sports and warfare. In *the Atlantic* (February 16, 2012), Patrick Lin worries about our ability to "upgrade" the bodies of soldiers through drugs, implants, and exoskeletons may be upending the ethical norms of war as we've understood them.

> If we can engineer a soldier who can resist torture, would it still be wrong to torture this person with the usual methods? Starvation and sleep deprivation won't affect a super-soldier who doesn't need to sleep or eat. Beatings and electric shocks won't break someone who can't feel pain or fear like we do. This isn't a comic-book story, but plausible scenarios based on actual military projects today. In the next generation, our warfighters may be able to eat grass, communicate telepathically, resist stress, climb walls like a lizard to and much more. Impossible? We only need to look at nature for proofs of concept. For instance, dolphins don't sleep (or they'd drown); Alaskan sled-dogs can run for days without rest or food; bats navigate with echolocation; and goats will eat pretty much anything. Find out how they work, and maybe we can replicate that in humans.'
> (source: http://www.theatlantic.com/technology/archive/2012/02/more-than-human-the-ethics-of-biologically-enhancing-soldiers/253217/

However, according to a recent study by researchers at North Carolina State University, educating the public about nanotechnology and other complex but emerging technologies causes people to become more "worried and cautious" about the new technologies' prospective benefits. These concerns require actions on different levels: public dialogue over the development of new emerging technologies and making scientists and engineers aware of their social role.

Assignment:
In this seminar we will discuss the issues of human enhancement. Read the two chapters of Mark Coeckbergh's book: *Human Being @ Risk*.

1. What is the traditional view about human being (the anthropological issue)
2. How is the traditional view about how to cope with human vulnerability, questioned? (the vulnerability issue)
3. Explain the positions in the controversy between trans-humanists and conservatives (bio- as well as info-conservatives)
4. Explain the tension between those who accept vulnerability and those who want to overcome it.
5. Explain the way that Mark Coeckelbergh responds to the anthropological issue and vulnerability issue (chapter 2)

Readings:

Coeckelbergh, Mark

(2013) Introduction. In *Human Being @ Risk: Enhancement, Technology, and the Evaluation of Vulnerability Transformations*. Dordrecht: Springer. pp.1-10. (Study Hall)

Coeckelbergh, Mark

(2013) The Transhuman Challenge. *In Human Being @ Risk: Enhancement, Technology, and the Evaluation of Vulnerability Transformations*. Dordrecht: Springer. pp.19-35

Additional readings:

A.A.

(2007) Nanotechnology: what's that? *PSYSorg.com*, 4 sept. (Student Portal)

A.A.

(2008) Study shows increased education on nanotech, human enhancement increases public concerns. *PHYSorg.com*. 16 Jul 2008. (Student Portal)

Bucchi, M.

(2004) Can genetics help us to rethink communication? Public communication of science as a 'double helix", *New Genetics and Society*, 23: 3, 269 — 283 (Student Portal)

Jaeger, J.F., Marcin, M.P. & Root-Wolfe, P.

(2008) Social implications of nanomedicine: considering both the risks and benefits of nanomedicine. *Chemistry Today*, 26, 1, 38-40. (Student Portal)

Roco, M.C. & Bainbridge, W.S.

(2002) Conversing Technologies for improving human performance: integrating from te nanoscale. *Journal of Nanoparticle Research*, 4: 281-295. (E-journal)

Swierstra, T, Boenink, M., Walhout, B. & van Est, R.

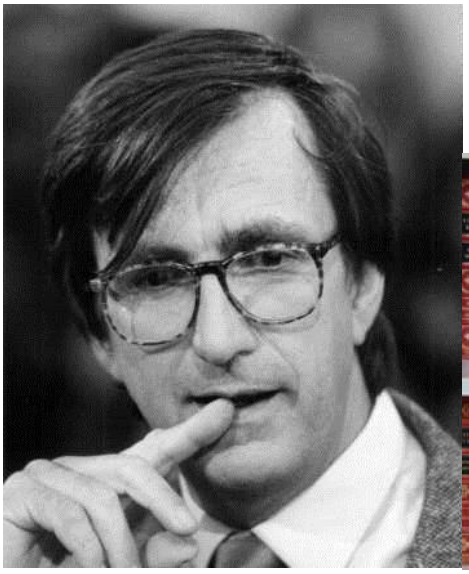
(2009) Converging technologies, shifting boundaries. *Nanoethics*, 3: 213-216. (Student Portal)

Swierstra, T. & Waelbers, K.

(2010) Designing the Good Life: a matrix for technological mediation of morality. *Engineering Ethics*. (Student Portal)

SEMINAR 8

ACTOR NETWORK THEORY



Bruno Latour

Michel Callon

About *Science in Action.*

"[S]urprisingly few people have penetrated from the outside the inner workings of science and technology, and then got out of it to explain to the outsider how it all works." (15) Through engaging examples and carefully built arguments Latour advances the theory of science as a group of networks tied together by those facts that are accepted as true by the network-- the "black boxes" which are, in effect, nodes of the network. Scientists in action compete for truth, money and prestige, won through alliances made by scientists, literature, labs, machines, communities and cities.

Latour begins with the time pressures and rival competitors faced by Jim Watson and Francis Crick as they researched the DNA structure, and the Eagle/Eclipse team as they tried to build a computer using new the new PAL chip. As he traces the history of these events, Latour introduces a character, the double-headed Roman god Janus, who speaks throughout the work to the iterative process that characterizes Latour's understanding of science: "Once the model works, people will be convinced" / "The model works when all the relevant people are convinced." (10) Latour also puts the point this way: "Facts and machines in the making are always under-determined. Some little thing is always missing to close the black box once and for all." (13) Latour chooses moments when facts and processes, such as DNA and computers, were not so firmly "packed," and shows through various methods, how they become closed, irrefutable. Governing and directing his work is the explication of rules of methods and principles. Rules of method are the "a priori decisions [which] should be made in order to consider all of the empirical facts provided by the specialized disciplines as being part of the

domain of science, technology and society.'" Principles are his own understanding of the facts at hand. (17) How, then, does a fact pass into a crystalline state?

Ideas and their proponents need a web of scientists to use them, cite them, build second and third generation articles on them. The more technical the literature is, the more social -- the more embedded in the reputations of reputable scientists -- and the harder it is for dissenters to make headway against ideas. Not only must ideas be cited in articles of reputable journals, and cited again, they must also acquire laboratories to support them. Nature is not so much tested in the laboratory as decided upon in the laboratory. So a dense web of literature and laboratory resources grows up as a hedge around an idea. "Everything else being equal, the winner is the one with the bigger laboratory or the better article." (103)

In chapters three and four Latour offers two central concepts in his work: translation, and the black box. An idea is established through socialization. How, then, do inventors and innovators control the participation of others? They translate the needs of others into resources that advance their own interests. For instance, an investor who wants the best possible factory flooring might be asked to invest in wood laminate in order to create new possibilities for materials that might answer her wishes. Latour lists a host of translation strategies and tactics to form alliances. A black box, then, is a series of alliances and chain of associations that has become an automated.
(Source: http://www.lehigh.edu/~cmp8/worksinprogress/summary/latour.html)

Assignment

1. Explain the notion of 'agency' in relation to objects as explained by Bruno Latour. List three examples on basis of your own experience how artifacts have agency
2. Read the last part (47-62) of the Master thesis of Kaj van Arkel about public spaces and explain in what way artefacts in public space acquire agency and can become effective means in achieving political ends.

Readings

Arkel van, Kaj

(2013) *Discomfort Zones: The Technologies and Politics of Public Space*. UM Master thesis ESST 2013-2014. (Student Portal)

Latour, Bruno

(2005) Third Source of Uncertainty: Objects too have agency. In: *Re-assembling the Social: an introduction to Actor-Network Theory*. Oxford: Oxford University Press. Pp.63-86. (E-book)

Law, J.

(1992). Notes on the Theory of the Actor-Network: Ordering, Strategy, and Heterogeneity. *Systems Practice, 5*, 379-393. (E-reader)

Additional readings

ANT Resources: http://www.lancs.ac.uk/fass/centres/css/ant/ant-a.htm & http://latourbugblog.blogspot.nl/2009/01/actor-network-theory-terms-and-concepts.html

Callon, M.
(1986) Some elements of a sociology of translation: domestication of the scallops and the fishermen of St Brieuc Bay. In: J. Law, *Power, action and belief: a new sociology of knowledge?* London: Routledge, pp.196-223. (e-reader)

Callon, M.
(1987). Society in the making: The study of technology as a tool for sociological analysis. In W.E. Bijker, T.P. Hughes & T. Pinch, *The Social Construction of Technological Systems. New Directions in the Sociology and History of Technology* (pp. 83-103). Cambridge MA.: MIT Press. (Study Hall)

Jasanoff, Sheila (ed.)
(2004) The Idiom of Co-production. In: *States of Knowledge: the co-production of science and social order*. London: Routledge. Pp.22-25.

Latour, B.
(1992) Where are the missing masses? The sociology of a few mundane artifacts. In: *Shaping technology/Building society. Studies in sociotechnical change* Cambridge, MA: The MIT Press. Pp.225-258.

Latour, B.
On Actor Network Theory: A few clarifications.
http://www.nettime.org/Lists-Archives/nettime-l-9801/msg00019.html

Latour, B.
(1987). Introduction. In: *Science in action: how to follow engineers and scientists through society*. Cambridge: Cambridge University Press. (pp. 1-17) (Study Hall)

Latour, B.
(1987). Machines. In:. *Science in action: how to follow engineers and scientists through society*. Cambridge: Cambridge University Press. (pp. 103-144) (Study Hall)

Latour, Bruno
(2005) *Re-assembling the Social: an introduction to Actor-Network Theory*. Oxford: Oxford University Press. (Study Hall)

Law, J.
Traduction/Trahison: notes on ANT. Published by the Centre for Science Studies, Lancaster University at
http:/www.comp.lancs.ac.uk/sociology/papers/Law–Traduction–Trahison.pdf

Law, J.
(2009). Actor Network Theory and Material Semiotics, In B. S. Turner, B. S. (ed.) *The New Blackwell Companion to Social Theory* , pp. 141-158.

Sismondo, S.
(2010). Actor-Network Theory. In *An Introduction in Science and Technology Studies.* 2nd revised edition, Oxford: Wiley-Blackwell Publishing, pp. 81-92.

SEMINAR 9

THE VULNERABILITY OF TECHNOLOGICAL CULTURE

One of the main problems we will focus on in this assignment is the vulnerability of technological cultures. During the 1980s, the Challenger space shuttle explosion, the Chernobyl nuclear accident, the Bhopal chemical disaster, and the Exxon Valdez oil spill reminded us that large-scale systems are vulnerable to human errors and technical malfunctions with far-reaching consequences. Risks to health, safety, freedom of choice, privacy and our environment are bound in the world. There are many examples to think of big technology-related accidents in our society. Like:
TWA 800 case: a major accident with a passenger aircraft. Was it downed by a terrorist attack or by a US nuclear missile? Or resulted the accident from system internal vulnerabilities?
Y2K problem, the millennium bug: Is this an example of "latent failure"? What is the role of human behaviour in the dangers that can result from the failure of computer systems?
The SARS-outbreak: This is only one of a series of epidemics affecting humans or livestock and that can only be contained at great costs. How does the structure of airline networks influence the characteristics of the disease (as epidemic)?

Or more recently:

The Japan earthquake and tsunami: The 8.9 earthquake was followed by a tsunami and nuclear disaster in Japan Spring 2011.

Cholera in Haiti: 24 November 2010 - As of 20 November 2010, the Haitian Ministry of Public Health and Population (MSPP) reported 60 240 cumulative cholera cases including 1 415 deaths at the national level. The case fatality rate in hospitals at the national level is 2.3%, with 67% of the deaths occurring at health services level and 33% at community level. In Port-au-prince and metropolitan area (Carrefour, Cite Soleil, Delmas, Kenscoff, Petion Ville, Tabarre and Croix des Bouquets), 5 778 cases, including 95 deaths have been reported.

Floods in Pakistan: About 14 million people, 6 million of which are kids, have been affected directly or indirectly by the floods in Pakistan, which are the worst in nearly a century, UN officials have stated. The Pakistan Disaster Authority has confirmed the death of 1 313 people. However, officials have said that the number could reach 1500, CNN has reported.

The BP Oil Spill in the Mexican Gulf: Evidence of BP oil spill health risks confirm Gulf coast public fears of Corexit toxic cloud. Russian Scientists have conducted studies on BP's chemical disbursant. Their conclusion; "Corexit 9500 which is being pumped directly into the leak of this wellhead over a mile under the Gulf of Mexico waters is designed to keep hidden from the American public the full, and tragic, extent of this leak." They further report, "When combined with the heating Gulf of Mexico waters, its molecules will be able to "phase transition" from their present liquid to a gaseous state allowing them to be absorbed into clouds and allowing their release as "toxic rain" upon all of Eastern North America."

These examples show very clearly the vulnerability of today's society and their causes and consequences.

Assignment

Choose one of the aforementioned examples or one of the docu-drama's from the BBC serie 'Surviving Disasters', or another one, and relate it systematically to the arguments of Bijker and Martin on vulnerability of technological culture. This implies that you explain what happened on basis of the four levels of Bijker (functional integrity; system; organization; society).

Reading

Bijker, W.E.

(2006) The Vulnerability of Technological Culture. In: *Cultures of Technology and the Quest for Innovation.* (H. Nowotny (ed.) Berghahn Books New York. Pp 52-69.(E-reader)

Additional Reading

Bijker, W., Hommels, A., and Mesman, J.

(2014) Studying Vulnerability in Technological Cultures. In: Hommels, A., Mesman, J. and Bijker, W. (Eds.) Vulnerability in Technological Cultures. Cambridge MA: The MIT Press pp.1-26 (Study Hall).

Martin, B.

(2006). Technological Vulnerability In: A. Teich (Ed.) *Technology and the Future; chapter 16* (10th ed.), New York pp. 174-185. (E-reader)

Video's / DVD's (available in the library).
Challenger: go for launch:
Hill, Bernard / BBC / 2000
Chernobyl nuclear disaster
Hill, Bernard / BBC / 2006
Surviving disasters
Lanning, Greg / BBC / 2006
San Francisco earthquake
Hill, Bernard / BBC / 2006
The sinking of the Estonia
Hill, Bernard / BBC / 2006

SEMINAR 10

PEER REVIEW

Each of you will prepare a research outline for your exam paper. The outline will be commented on by two reviewers (fellow students). You will concentrate on some of the most important aspects of academic writing, that is:

1. identify a (doable) topic
2. explain the relevance of the topic in relation to the course
3. formulate a research question
4. formulate 3 sub-questions
5. create a preliminary outline of your argument

Make sure to send your page to your peers so that each of you can prepare comments of each other's page before the meeting! The comments should be directed to the issue of topic, research question and sub questions, and claim. You will discuss each other's work in the meeting in your own group, and report back to the rest of the group.

For those of you who just entered the UCM programme: read the chapters of Booth & Williams (chapter 3, 4, and 7) as this text will help you to write a research paper. Beware: this is a 200-level course and as such no additional help will be provided by the tutor.

Readings:

Booth, W., Colomb, G., & Williams, J.
(2008).The craft of research (3rd ed.). Chicago: The University of Chicago Press. Chapters 3 & 4 (pp. 35-67) + 7 (pp. 108-119) (E-book)

Additional literature

Rawlins, J. (2002). *The writer's way*. (5th edition). Boston/New York: Houghton Mifflin. (Study Hall)