Technology and Society

Technological failure

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Delft University of Technology
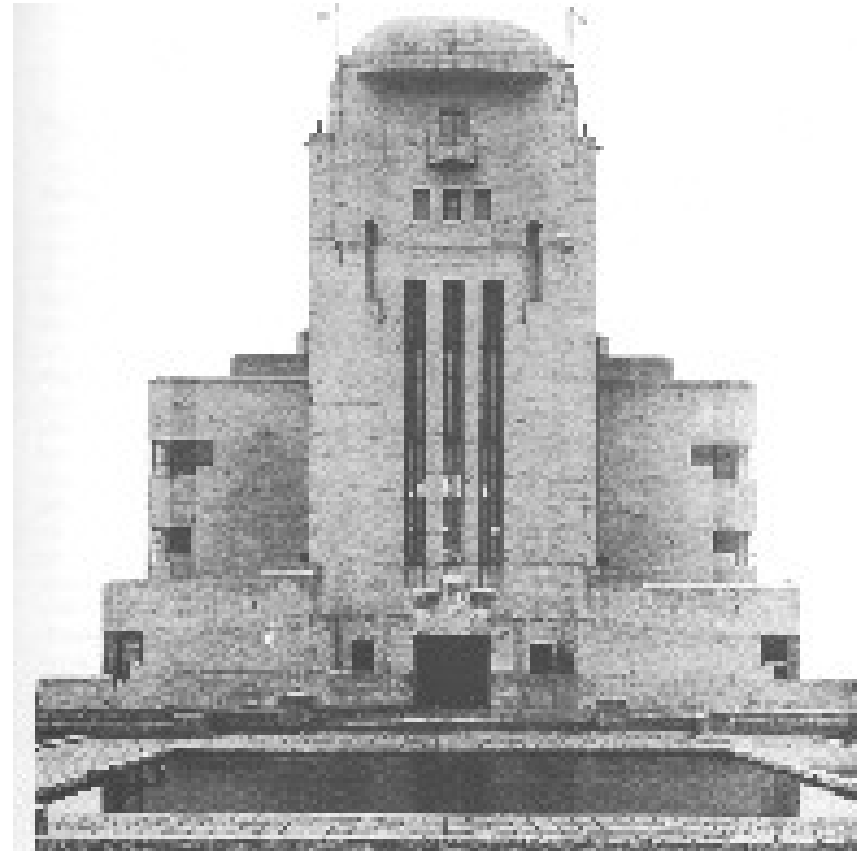
Technology and Society
Radio

Long wave radio
   (Radio Kootwijk)

Became unnecessary since
short wave radio seemed
to function better

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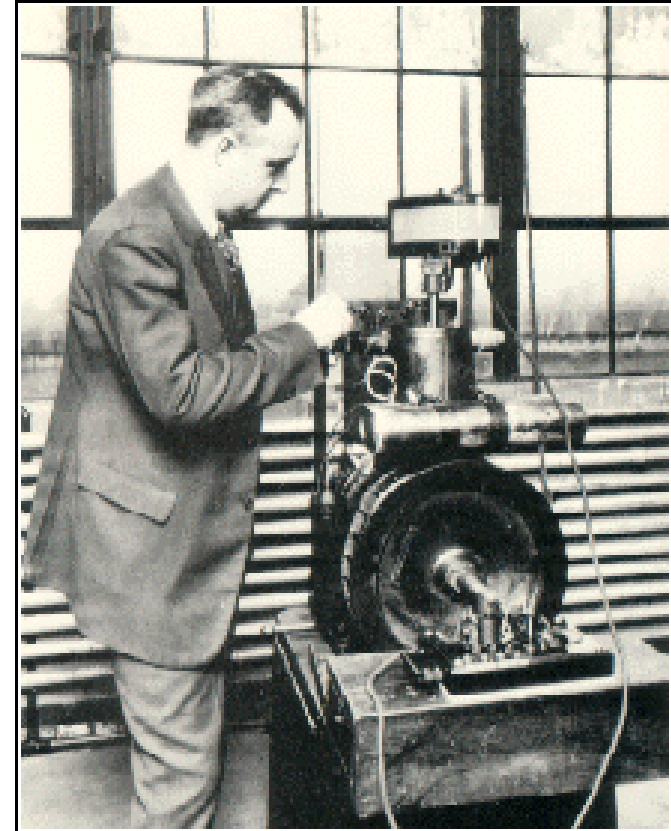# Technology and Society
CFC's

Thomas Midgley jr.

Developed tetra-ethyl lead (TEL) as an additive to gasoline and chlorofluorocarbons (CFCs)

Due to environmental effects:

In 1973 the first measures were taken in the US to phase out leaded gasoline

Since 1999 CFC's are no longer being produced

http://www.dartmouth.edu/~toxmetal/images/Midgley.gif

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DDT

Paul Hermann Muller

> Invented DDT in 1939 (insecticide useful to control insect borne diseases)

Won the 1948 Nobel Prize in Medicine

Silent Spring, 1963, Rachel Carson

> Dealt with the effects of chemicals such as DDT in the environment.

> This lead to the banning of DDT in the 70's and 80's in western countries

http://sandwalk.blogspot.com/2007/03/nobel-laureate-paul-hermann-mller.html

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Havilland Comet

First commercial jet airliner
first flight in 1952

2 comets crashed in 1954
due to fuselage fatigue

Aircraft was withdrawn and
had to be redesigned

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Wadden area, Netherlands

Canal in Wadden-area

Was never constructed due to political and environmental reasons

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Bridges

Erasmusbridge, Rotterdam

Bridge 'swings'

Wind induced resonance in cables

http://en.wikipedia.org/wiki/Image:Erasmusbrug.jpg

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Bridges

Millenium Bridge,
London

Horizontal resonance

Caused by
pedestrians

www.morgenthal.org

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Where do things go wrong?
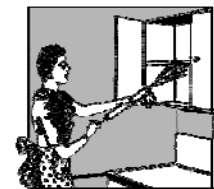
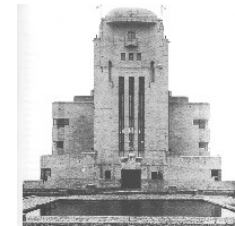Technology 'did not work' as was expected

    Failed completely:

    Long wave radio in Kootwijk

    Didn't fully 'work':

    Bridges, Havilland comet

    Did other things as well:

    CFC's and DDT

http://www.mind
fully.org/Pesticide

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Technology and Society
Where do things go wrong?

Social demands for a product are not assessed correctly, or change

Usually all relevant requirements are discovered in practice:

Rachel Carson's Silent Spring

http://en.wikipedia.org/wiki/Rachel_carson

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What is Technology Assessment?
1950's

Technological optimism

    Nuclear energy would be 'too cheap to meter'

    Natural gas would be exhausted

    Flying cars

Technology is a positive sum game

http://www.retrofuture.com/flyingcar.html

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What is Technology Assessment?
1960's

Charles Lindberg

loved both technology and nature

pioneered in looking for a balance between technological achievements and nature

→ technological assessment

http://archives.delaware.gov/100/airlandandsea/A%20Meeting%20of%20Innovators.shtml

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What is Technology Assessment?
Late 1960's

Technology and its consequences are decisive for the environment

Society (governments) should be able to make found judgments

Technology assessment as a neutral, factual analysis of technological effects as an input in the decision-making process.

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What is Technology Assessment?

Early 1970's

1972, USA, Office of Technology Assessment

Technology Assessment is intended to be a neutral, factual input into the decision-making process.

To provide members of congress with an objective and authoritative analysis of complex scientific and technical issues

Europe did not follow immediately due to other political traditions

http://en.wikipedia.org/wiki/Image:OTA_seal.png

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What is Technology Assessment?

Technology Assessment Defined

Technology Assessment is:

the **systematic** identification, **analysis** and **evaluation** of the **potential secondary consequences** (whether beneficial or detrimental) of

technology in terms of its **impacts** on **social, cultural, political, economic** and **environmental** systems and processes.

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What is Technology Assessment?

Technology Assessment Defined

Technology Assessment is an attempt to:

    establish an **early warning system** to detect, control, and
    direct technological changes and developments so as to
    maximize the **public good** while **minimizing** the **public risk**

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What is Technology Assessment?
1980's

In the 80's Europe followed with several
institutes for Technology Assessment:

Rathenau
TAB
STOA
POST
IPTS

http://www.jrc.es/
http://www.europarl.europa.eu/stoa/default_en.htm

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What is Technology Assessment?
Criticism

Marcuse/Wynne:

TA is not democratising technology but 'repressive tolerance'

Inpredictability of effects of technological change

Assessment is arrestment

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What is Technology Assessment?

Second order effects

Behavior is changed by the introduction of new technologies:

- new highways and bridges attract traffic
- change of family life by television

Third and higher order effects:
- birth control pil – sexual behavior - diseases

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What is Technology Assessment?
Problems with classical Technology Assessment

Classical technology assessment:

Is deterministic

Objective claims can not be proven

'After the fact'- problems are identified when they are already there

It is not productive to correct on hindsight

Does not contribute to neutral, factual decision-making for technological or scientific issues.

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What is Technology Assessment?

Strategic Technology Assessment

A process to analyze technological developments and discuss the consequences

The goal of technology analysis is to provide those involved with information to formulate strategic policy, and to define areas of further study.

But:

    This is not neutral

    Goal is to implement results

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What is Technology Assessment?

Constructive Technology Assessment

Presuming that:

   Technology can be directed

Improve interaction between technology developers and those
implementing technology

Interactive technology assessment, public debate

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What is Technology Assessment?

Classical vs. Modern Technology Assessment

Differences between classical and modern Technology Assessment are exaggerated

Public and political formulation of opinions is now most important but:

> Political lobby and 'media coverage' were already relevant for the Office of Technology Assessment back in 1972

Public debate must be based on facts. This creates the need for classical technology assessment, that today is less pretentious

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