

Desire
for Future,

Change,

and
How to Admit
Failure

A transdisciplinary symposium
of the Münchner Kreis,
Ludwig Maximilian University
and Technical University Munich
at the Festival Ars Electronica

A project in the
overtures-ZeitRäume series
by artcircolo and pilotraum01.

Linz, Austria
September 4 and 5, 2010



overtures – ZeitRäume

www.overtures.de/zeitraeume

Event Outline

This first ZeitRäume event at the festival Ars Electronica, September 4/5 2010, is a transdisciplinary discourse intertwining speeches, statements, discussions, dialogues and art projects. It is a fusion of science, arts, economy, business, and design.

We intended to show that people are going to change, taking responsibility for a sustainable future and to create more happiness. The participants of the event shared experiences, opinions and actively attended the process of change.



Supporting organisations

Ars Electronica Linz, Austria, www.aec.at
artcircolo Kunstprojekt, www.artcircolo.de,
www.overtures.de

Münchner Kreis e.V., www.muenchner-kreis.de

Technical University Munich, www.tum.de

Ludwig Maximilian University Munich www.lmu.de

Network Economy Group, www.network-economy.com

pilotraum 01 e.V., www.pilotraum01.org



CONTENT

overtures – ZeitRäume

Program - Symposium

Projects

Presentations

Prof. Arnold Picot

Dr. G. Brann/S. Doeblin

Prof. Han Brezet

Prof. B. Brügge

Prof. G. Heinsohn

Prof. D. Innerarity

Prof. E. Pöppel

Dr. W. v. Reden

Dr. M. Richartz

Dr. V. Winschel

Catalogue (excerpt)

Ars Electronica 2010 (summary)





overtures – ZeitRäume

www.overtures.de/zeitraeume

overtures - ZeitRäume sees itself as a transdisciplinary sequence of project events in which experts in art, technology, design, ethics, science, politics and economics join in creating an experience of our future. The concept is flexible and can be included as such in different contexts with local-specific issues.

overtures – ZeitRäume wants to create and to experience reflection and change through art processes and art methodologies. Our target is to motivate the attendees to take responsibility for our planet and our future.

The first event started with the symposium: “Desire for Future, Change and how to admit Failure” including art and design projects at Ars Electronica Festival Linz, Austria, the 4/5th September 2010.

Curators:

Dr. Serafine Lindemann

Dr. Christian Schoen

Organisation:

artcircolo Kunstprojekt and pilotraum 01 e.V.

In collaboration with Dr. C. Schoen

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Desire
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Change,

PROGRAM - Symposium

and
How to Admit
Failure



HOME



overtures – ZeitRäume

www.overtures.de/zeitraeume

Saturday (September 4th), 6pm

Location: Sky Loft, 3rd floor, Ars Electronica Center

Welcome

Prof. Arnold Picot (Münchner Kreis)

Dr. Christian Schoen (overtures-ZeitRäume)

Gerfried Stocker (Ars Electronica)

Lectures

Prof. Ernst Pöppel, psychologist and neuroscientist,
LMU Munich

Evolutionary Heritage: Decision processes,
self repair of systems in uncertain environments,
aspects of brain research

Prof. Daniel Innerarity, Professor of political and social
philosophy at the University of the Basque Country,
San Sebastian

The Ignorance Society

Conversation Dinner

Each table will receive a subject concerning sustainability,
admitting failure and change in our society and
is asked to propose an implementation scenario. The
results will be summarized and discussed next day.

Saturday (September 4th), 6pm

Location: Sky Loft, 3rd floor, Ars Electronica Center

Conversation Dinner – Questions

Manufacturing

Manual work has been replaced since by automation and assembly line work in huge plants. There is a clear trend for luxury products back to handicraft and highest quality. How to implement a similar change for commodity products to increase sustainability and working ethics in your business environment?

Failure as a source of creativity?

Failure (mistakes) in reproducing DNA is the source of evolution. Can we use this as a system design principle and where can we use it? (E.g. in software, business, architecture, pharmacology?)

Personal mobility

Personal mobility is currently linked to cars, carbon oriented fuel and dislocation between life, work and goods. The advertisement campaign of the automotive industry is focused on consumption, sexual power, and fictive freedom of life. How to change an automotive corporation to be more sustainability and environmental oriented and how to implement and to speed up the development of sustainable solutions that are safe and compatible with human beings?

Democracy 2.0?

In times where industrial lobbies (e.g. pharmaceutical industry) gain more power and influence people perceive the state as an adversary third body. How can we repair our democratic system? Do lobbies prevent certain developments (such as Asiatic medical systems or electric cars)?

What we eat

The increasing manipulation of eatables to grow the amount of available food causes severe issues as poisoning by insecticides, gene manipulated food, bad quality, environmental issues and others. How and when can we come back to a healthy and sustainable food chain by avoiding huge monocultures, excessive transportation effort and risky experiments with food, animals and plants?



overtures – ZeitRäume

www.overtures.de/zeitraeume



Sunday (September 5th), 10:30am

Location: Tabakfabrik,

10:30am Welcome

Gerfried Stocker (Ars Electronica)

Dr. Christian Schoen (overtures-ZeitRäume)

Prof. Arnold Picot (Münchner Kreis)



10:45am

Prof. Dr. Gunnar Heinsohn, sociologist and economist,
University of Bremen: Central Banks as Pushers of
the Financial Crisis



11:30am

Dr. Viktor Winschel, Universität Mannheim, VWL Institut
für Internationale Wirtschaftsbeziehungen
Towards a Language for the economics of Economy



12:00

Prof. Ernst Pöppel, psychologist and neuroscientist,
LMU Munich

12:30

Prof. Dr. Bernd Brügge, computer scientist, TUM
Software Engineering: How to deal with failure



overtures – ZeitRäume

www.overtures.de/zeitraeume

Sunday (September 5th), 10:30am

Location: Tabakfabrik,

1:00pm Guided tour to the projects: Engagement to our Future

Combine transdisciplinary experiences and
art processes to gain knowledge. –

Courage for active change and future through artists

Dr. Serafine Lindemann and Dr. Christian Schoen,
curators, Germany

3:00pm

Stefan Doeblin, Network Economy AG,
Metro Crowd Financing for SMEs in underdeveloped
metropolitan areas

3:20pm

Prof. Dr. Han Brezet, Technical University Delft
Sustainable Design Program:
Applications: How to Admit Failure!

3:50pm

Dr. Martin Richartz, computer scientist, Vodafone R&D
Germany, Dr. Serafine Lindemann, curator, artcircolo:
Manufactured Demand: What it means to grow a
multi-billion Dollar industry around bottled water



overtures – ZeitRäume

www.overtures.de/zeitraeume

Sunday (September 5th), 10:30am

Location: Tabakfabrik,

4:10pm

Panel Desire for Future, Change
and how to admit Failure

Benjamin Bergmann, Finnbogi Petursson, Gerfried
Stocker, Prof. Dr. Arnold Picot, Dr. Bernd Wiemann,
Dr. Christian Schoen

Video Including presentation of the results of
the conversation dinner

4:50pm

Dr. Wolf von Reden, Fraunhofer Gesellschaft HHI
Science without error bars.





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PROJECTS



Finnbogi Pétursson (IS)

Earth, 2010
Installation



Benjamin Bergmann (DE)

Never Ever, 2010
Installation





Symphony for broken speakers, 2010
Klang-Installation

Wherever you go I'll be already there.
Small sounds, 2010
Klang-Installation

Kalle Laar (DE)





quelle 01



Prof. Han Brezet TU Delft (NL)



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Presentations

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Prof. Arnold Picot

Introduction

We live in a fast changing world. Thus, the future is less predictable than ever. We know of a lot of drivers that speed up the change. And we have to be aware that unexpected developments and surprises will continue to appear as well, yet at unknown points in time and with unknown content. How can we gain an attractive future under such dynamic and turbulent conditions? The recent economic and financial crisis has once more demonstrated that a sheer extrapolation of past experiences is not the right way to ameliorate the conditions. It seems that fundamental learning and taking a fresh look at our world have to play a more crucial role in gaining a better future. However, that's easier said than done. Humans develop their perceptions and evaluations of events based on previous experience and cultural imprint. Our interpretation and understanding of the world, "laws" that are taken for granted and that seem to govern economic and societal life are constructs of human minds and subject to potential revisions. When deep crises or great surprises appear it is time to question traditional certainties about our world and to craft a changed view also involving the acknowledgement of previous failures whose underlying behaviour have not been understood as mistaken to date. Interdisciplinary dialogue and confronting with artistic expressions are ways to open the often hardened understanding and to start experimenting with new paths of thinking. It poses a real challenge to find out whether a deviation from a pursued path may be regarded as a curable error, a random event as part of unavoidable noise, or whether it indicates a fundamental shift and the necessity to change the understanding and thinking about some realm of our world. The symposium at Ars Electronica 2010 - prepared by a consortium of Münchner Kreis, artcircolo, Ludwig Maximilians Universität München and Technische Universität München - helps to intensify the transdisciplinary dialogue as well as the exchange with arts in order to open our minds towards improved conceptions and new thinking for a better understanding of the course of events and for a better future.

Arnold Picot

Chairman Münchner Kreis and Ludwig Maximilians Universität München



Dr. Georg Brann / Stefan Doeblin



Metro Crowd Financing or How to Admit Financial Failure

Dr Georg Brann, Stefan Doeblin

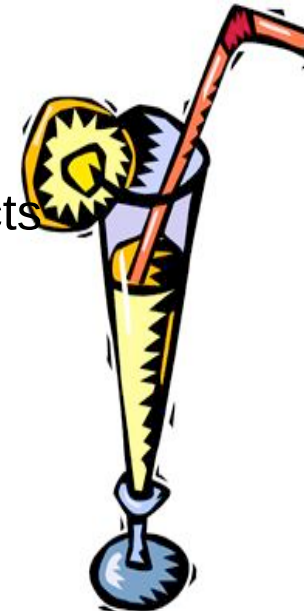
Linz, September 5th, 2010

Metro Crowd Financing (MCF) what is that Cocktail for ?

To Finance Small Enterprises (SE) in Suburbs of Mega Cities in Developing Countries like Mumbai, Lagos, Sao Paolo,...

How is MCF working?

- From members to members
- By local networking economy exchanging stakes
- With equity only – no loans in the first instance
- Supporting local, sustainable, social, ecological projects
- Advising and promoting each other and by experts

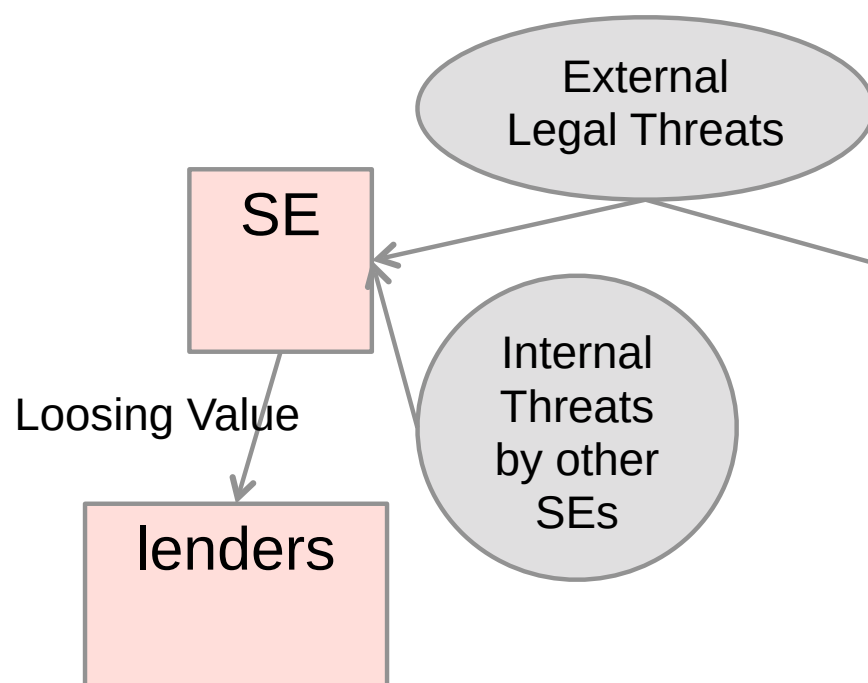


- Business and assets are often based on “custom and practice” and not based on legally registered property
- Peru (Philippines), the value of held but not legally owned rural and urban real estate amounts to some US\$ 74bn (133bn), Hernando de Soto, The Mystery of Capital
- “Property rights transform goods and resources into money priced commodities and assets”, Prof Gunnar Heinsohn
- “Huge value potential to transform the informal economy into a formal one and capitalizing it into registered assets/property’, Hernando de Soto

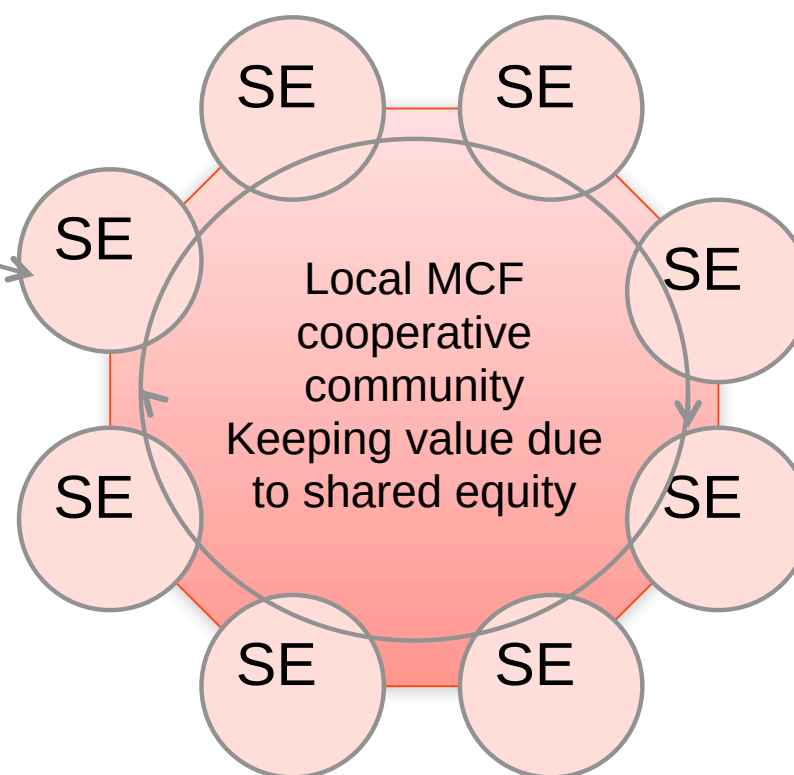
A Cooperative Cocktail

Interest rates and loans penalise Small Enterprises (SEs) in the informal economy environment

Full risk



Shared risk



What is in the MCF Cocktail?

- Responsibility of all members by owning stakes
- Close Relationship- members know each other and control each other
- External advisory by experienced experts
- Wisdom of the Crowd – members decide and create local demand and supply

How does it taste?

- Metropolitan colourful, vibrant and intense taste
- Sustainable and ecological by local funding, local products & services and personal interest of members



Causes of (Financial) Failures

- Cause # 1: Lack of Discipline
Members using the same process and services
- Cause # 2: Inadequate Protection Against Unexpected Events
Members insure each other
- Cause # 3: Lack of Desire as a consequence of a Poor Attitude to developing Wealth
Members create wealth and an environment of common interest
- Cause # 4: Lack of Knowledge
Member advisory services
- Cause # 5: Lack of Foresight
Coordinated local demand and supply
- Cause # 6: Failure to construct Plans
Joint process, procedures and knowledge

Why to drink such a cocktail ?

To Create legally registered property out of possessions to generate sustainable business!

- By creating a cooperative community to support each other
- By implementing property/asset registration to transform the informal economy to a formal one
- By equity versus interest rates



Prof. Han Brezet



Design for Sustainability in Delft - a reflective practice approach

Prof. Dr. Ir. Han Brezet
Research Director
Faculty of Industrial Design Engineering - TU Delft NL

Ars Electronica 2010 - Desire for Future

Reflective Practice

Research by Design

Learning from Failures (and Successes)

Glaubensunwilligkeit

Standortsgebundenheit

2

Example 1
“Confession”

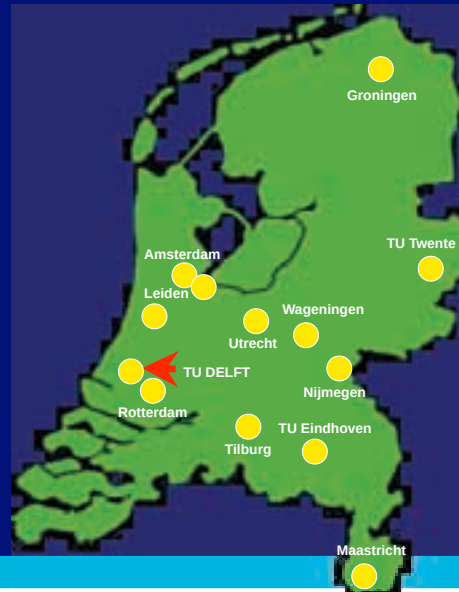


Example 2

“Standortsgebundenheit”

4

Universiteiten in NL



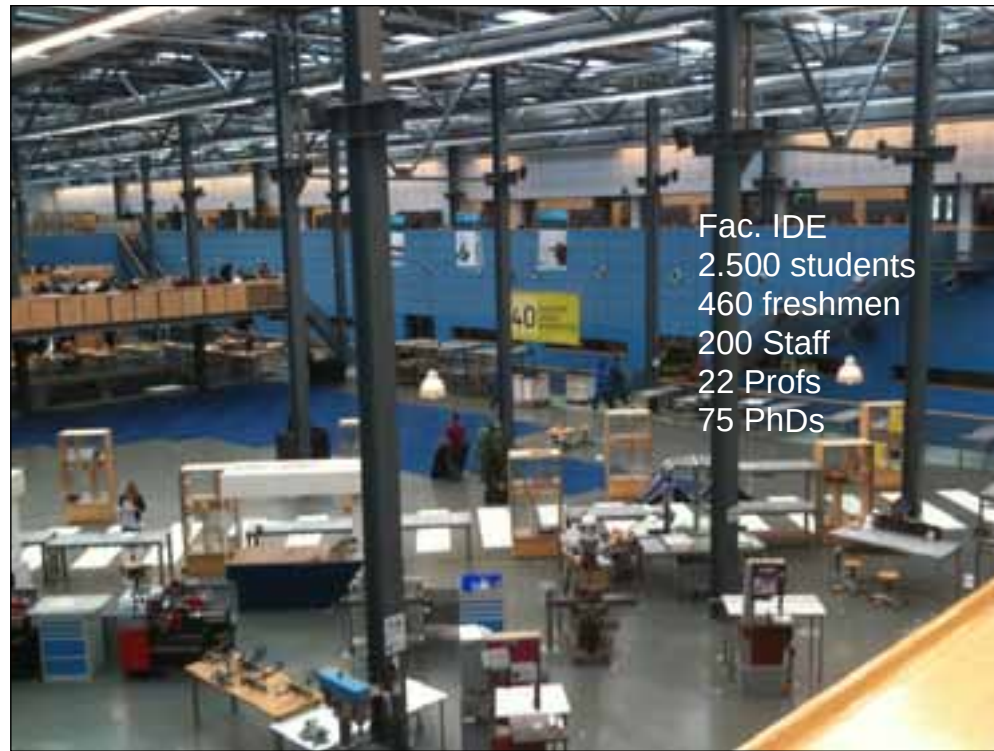




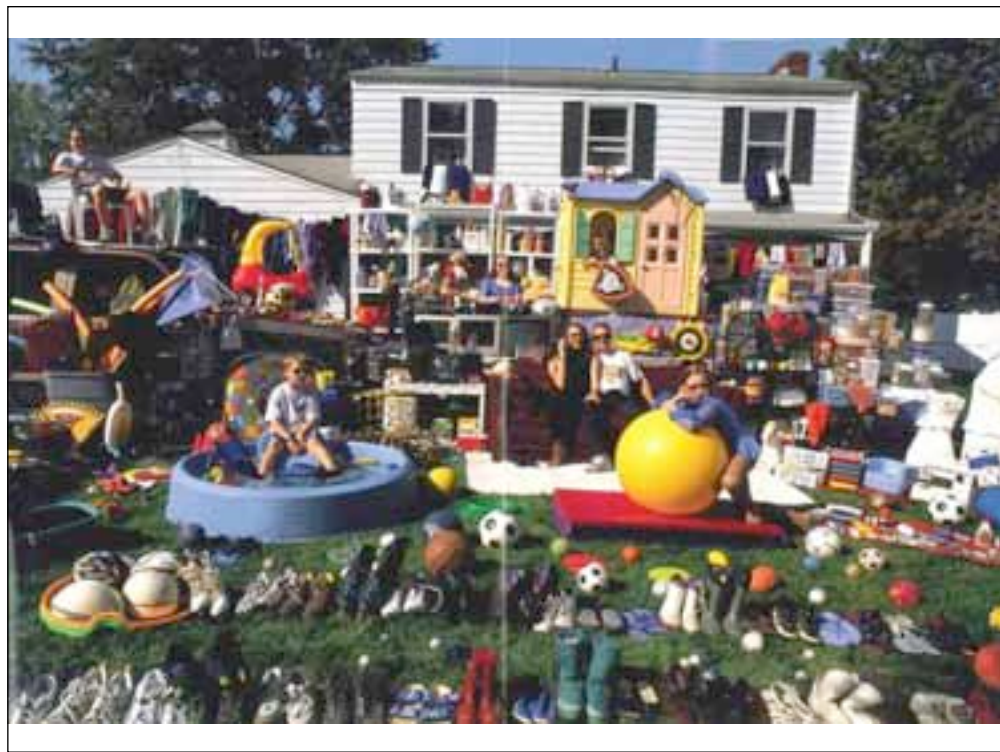








Fac. IDE
2.500 students
460 freshmen
200 Staff
22 Profs
75 PhDs





Recent 50 year

world population + 50%

material flows + 1000%

90% of raw materials for products are waste within 3 months

throw-away society: reuse & recycling

mobile telephone: 500 - 4.000 year for natural biodegradation

energy - climate

United Nations University/DfS TU Delft
et al

WEEE 1/3 E waste treated correctly

NRC 11th november 2009



EU WEEE website

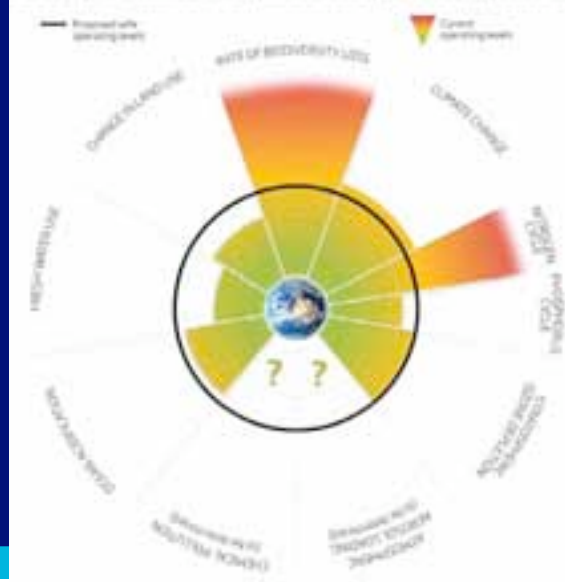


15

Beyond the boundaries

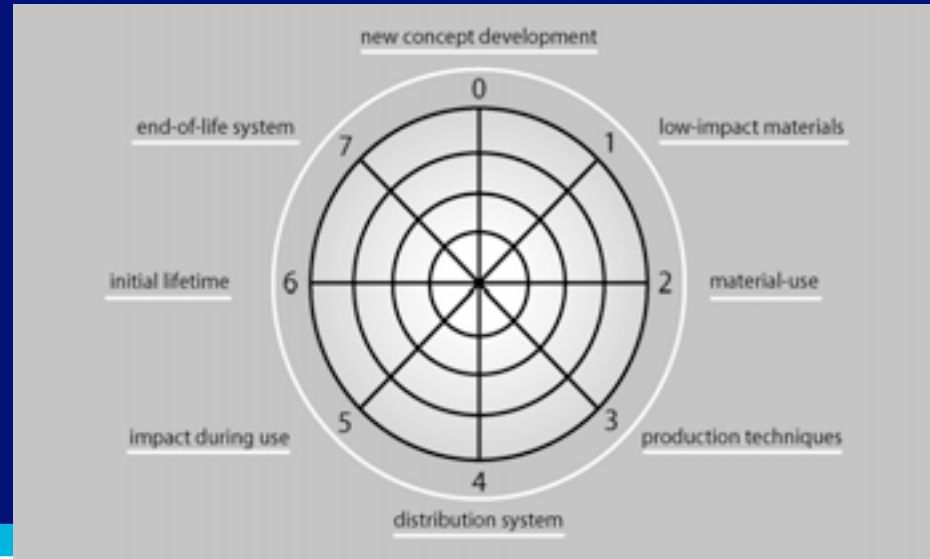
© Wiersma et al.

We have already exceeded three of nine planetary boundaries and are at great risk of transgressing several others



16

Life Cycle Design Strategies









Adventures in EcoDesign of Electronic Products
1993-2007

A.S. Stevens



We started with the end in mind when developing this TV. In a continuous search for sustainable solution lowering our environmental impact, we came up with this balanced combination of eco and design. **Ready for a sustainable future.**

ECO

DESIGN

Co-operation with Product Companies

Awarded Green Flagship
DVDR 980 2002



	Weight	Power	Cost
Energy Factor Rating	100	122	104
Energy Consumption	100	122	104
Product Weight	100	122	104
Package Weight	100	122	104
Recyclability	100	122	104

Philips Consumer Electronics
www.philips.com

Let's make things better PHILIPS

Green Flagship 2005
HiFi system



Green Flagship 2005

PHILIPS

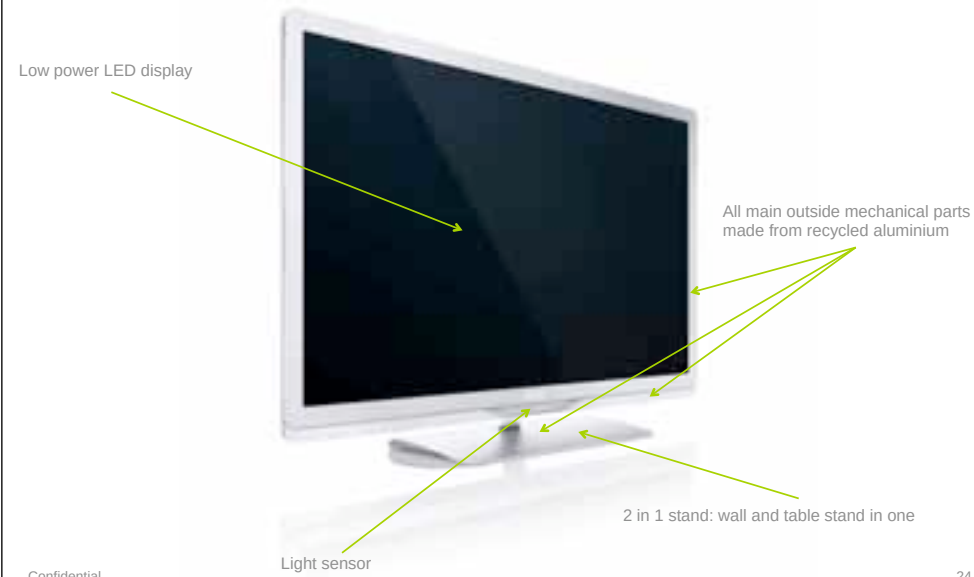
Green Flagship 2006
32" LED widescreen flat TV
Digital Crystal Clear



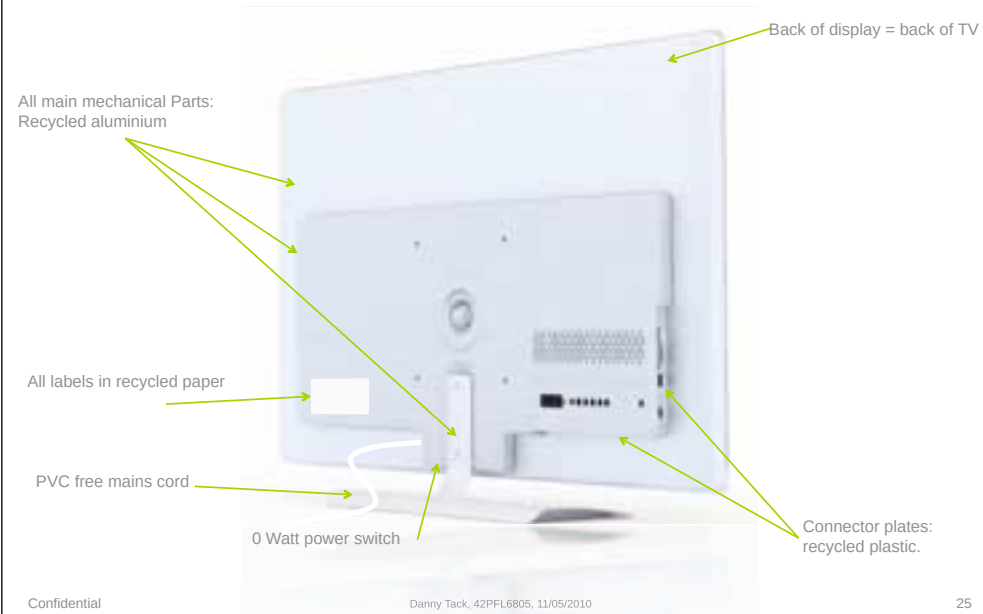
Green Flagship 2006

PHILIPS

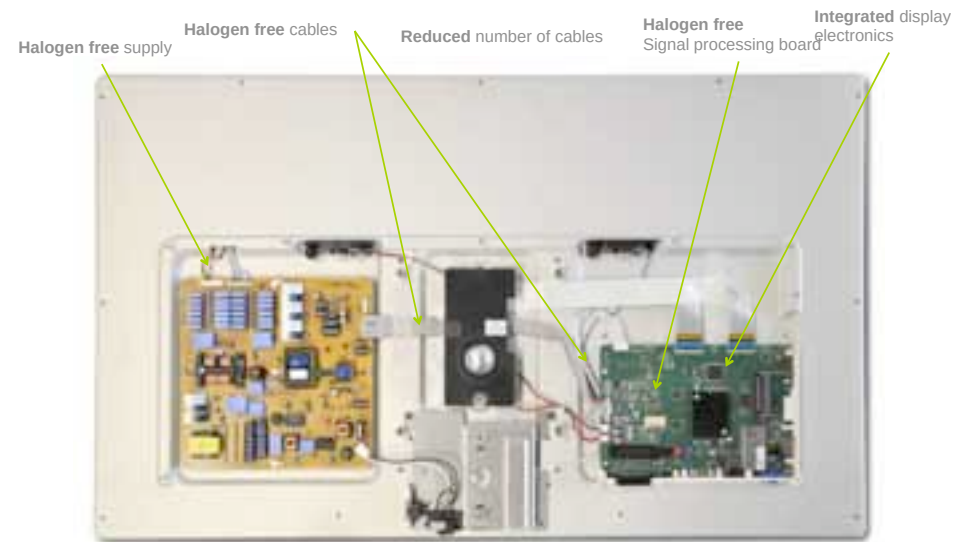
PROUD TO PRESENT 42PFL6805 / *OVERVIEW*



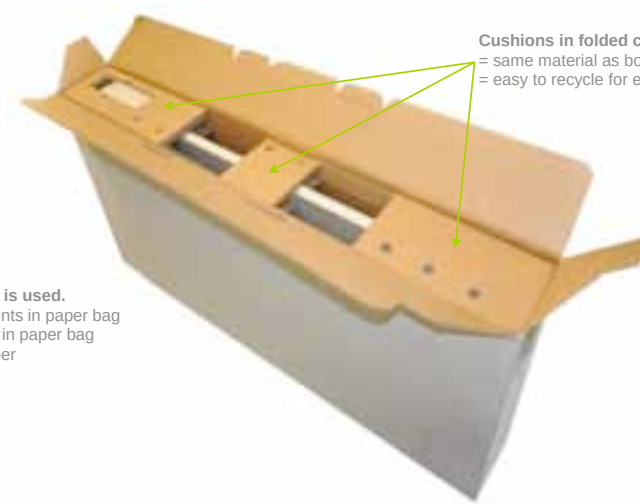
PROUD TO PRESENT 42PFL6805 / *OVERVIEW*



PROUD TO PRESENT 42PFL6805 / *OVERVIEW*



PROUD TO PRESENT 42PFL6805 / *OVERVIEW*



Cushions in folded cardboard
= same material as box
= easy to recycle for end customer

No more plastic is used.

- Stand components in paper bag
- Remote control in paper bag
- Dust bag in paper

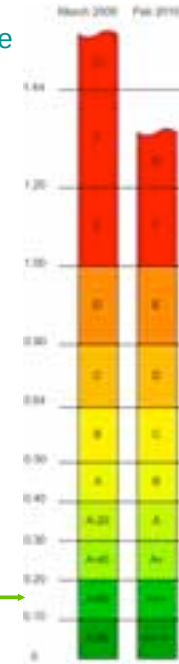
ENERGY

- **Mains switch (0W)**
A switch is added to the set to remove the set from the mains input and reduce the power consumption in standby to 0W. This is the ideal situation for covering longer periods of absence such as a vacation period.
- **Light sensor**
The internal ambient light sensor tunes the light output of the set to allow enjoyment of the immersive viewing experience at its best while at the same time substantially reducing the power consumption in normal and dark viewing environments.
- **EU Eco-label compliant**
The EU eco-label certification recognizes televisions that have a range of sustainable features, including low energy consumption and low standby power.
- **Energy Efficiency Index (EEI) < 0.20**
 - EEI will define the EU Energy Label
 - Will Result in an A++ Energy Label definition

An energy efficiency index of 0.20 measured according IEC62087 ed.2, using the dynamic video footage, is unprecedented for a Philips TV. This lower power consumption is obtained through the use of a high efficiency side LED backlight display, high efficiency supplies and state of the art dynamic dimming video algorithms which calculate the needed drive of the backlight for the video content, thus enhancing the picture performance as well as optimizing the power consumption.

42PFL6805	
0W switch	Yes
Standby	<0.075 W
On mode	46W (42") *
EEI	0.20
* 41.7W converted to 40"	

EEI-scale



42PFL6805



EXTRAS / SOLAR REMOTE

- **Powered by light.** The remote is charged by the solar cell, even for indoor light conditions. For those users who keep the remote in very low light conditions, the battery has capacity to keep it working for a number of months. If there is a persistent shortage of light, an indication on the TV is given when the remote's battery is running low.
- **No battery replacement.** The remote has one rechargeable battery (Lithium Ferrite battery) in which the light energy is stored. This battery lasts the whole product life.
- **Energy efficient power management.** The optimized energy consumption of the electronics results in a low energy need and thus maximum usability of the remote.
- **Materials.** The top plate is made from recycled aluminium. No additional finishing has been added to the plastic housing.

Solar Cell



TomTom for Sustainability

Valuation and improvements of the sustainability of TomTom

© 2009 Gabriëlle Muhring and TomTom International BV Amsterdam

Gabriëlle Muhring
Faculty Industrial Design Engineering
Delft University of Technology
Master: Strategic Product Design

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Supervisory team
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Mw.dr.ir.S.C. Mooy

TomTom International BV
T. Lillette



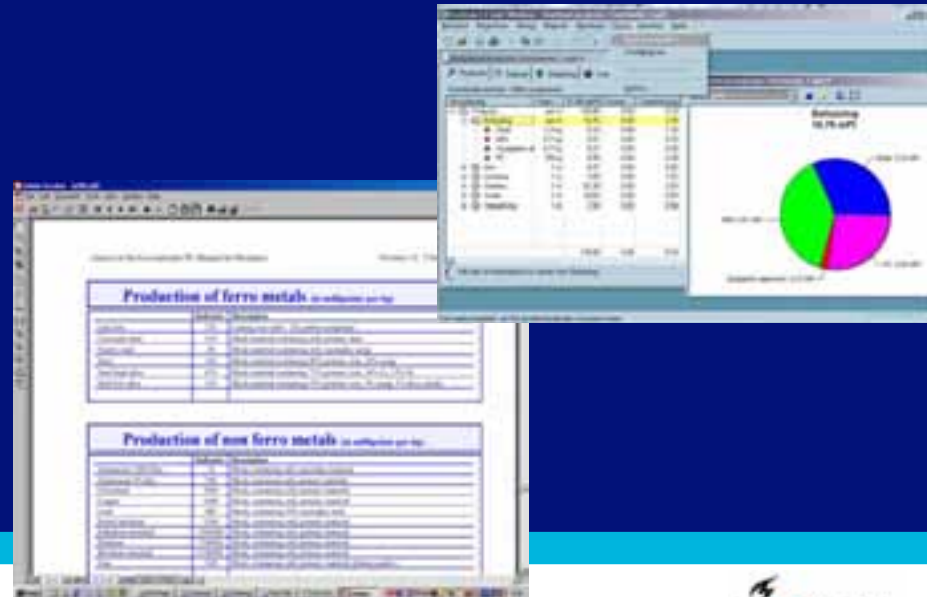
Car navigator benchmark - Gabrielle Muhring



Figure 3.31: Benchmark results

31

LCA: Eco-Indicatoren



Example 3

“Too optimistic”

2000: Beyond Applied Ecodesign - Manzini, Ryan etc.

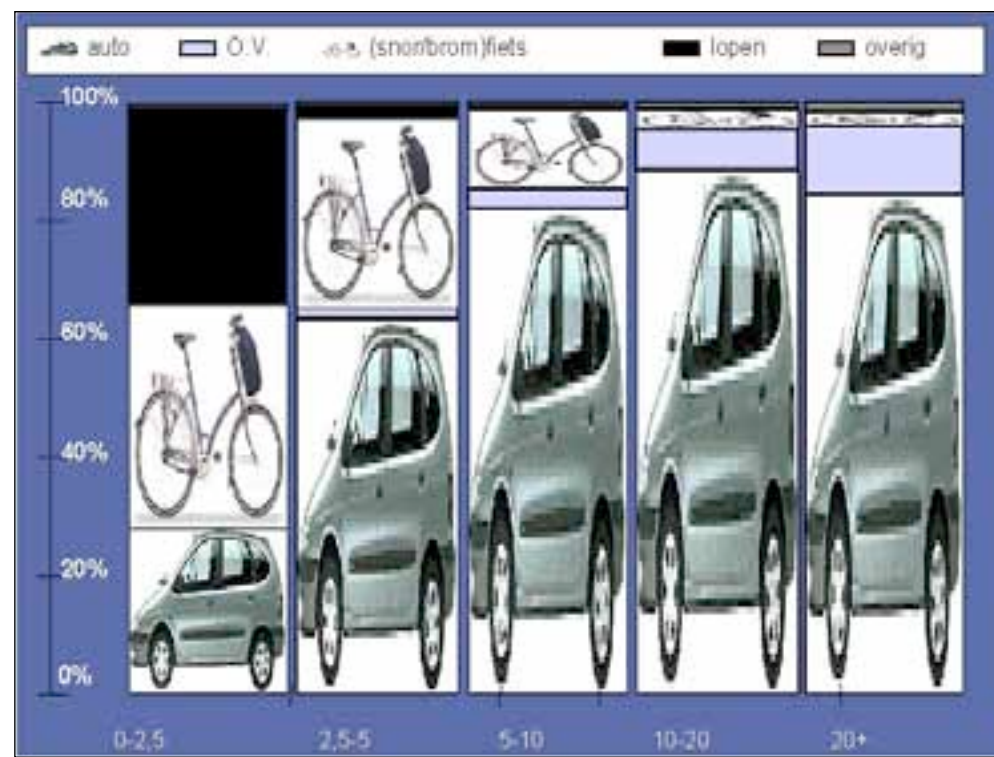


DfS vision 2000

- Need for radical changes - transitions
- Completely new PSS concepts

Example 4

“Green over-ambition”



Coalition Development

- Actors from business organizations to research institutes
- Design inspired by Nike employees



Service Development

- Not only an artifact.....Product/Service System (PSS)





The Prince and I: two test drivers!



Three lessons

- Q: can multinationals contribute to sustainable transition?
- Priority for young green designers and new ventures
- Multi-level model



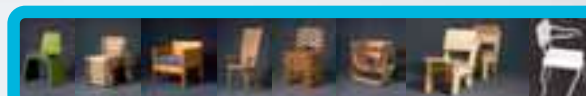
Multi level transition model Peter Joore, 2010

Example 5

“Promoting Young MSc’s and PhD’s in green design and business”

ANA MESTRE

PABLO VD LUGT



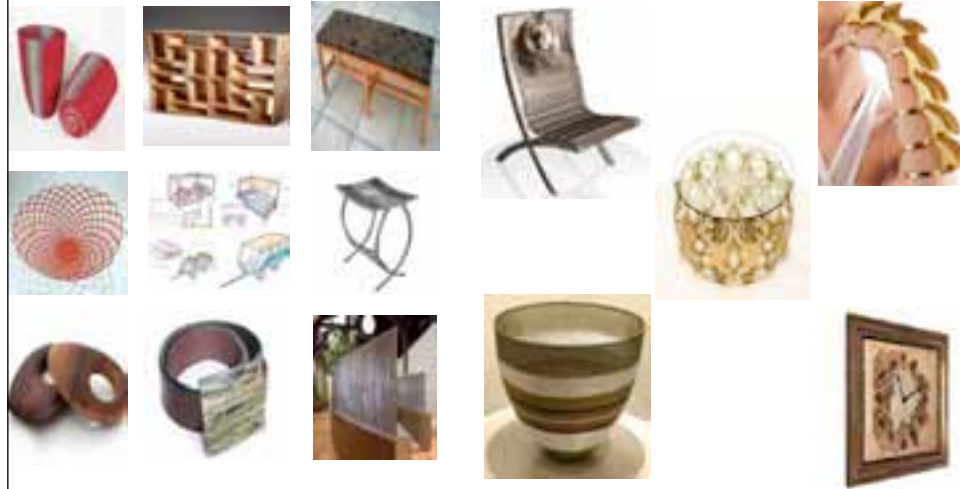
Value addition through Sustainable Design

A case for Indigenous bamboo Products in Botswana



Paulson LETSHOLO

Sample of Value added Botswana Indigenous Products



Multifunctional Duo Bike Carrier - Onno Sminia



48

Cleaning-module

The collage displays the 'vracht fiets' cleaning module from multiple perspectives and includes technical specifications:

- Side View:** Shows the vehicle's profile with a length of 200 cm and a height of 125 cm.
- Front View:** Shows the front of the vehicle with a width of 52.5 cm.
- Rear View:** Shows the rear of the vehicle with a width of 72.0 cm.
- Technical Drawings:** Two line drawings provide detailed views of the vehicle's structure and dimensions.
- Branding:** The text 'vracht fiets' is visible on the side of the vehicle.

vracht fiets
 Model: vracht fiets
 Year: 2010
 Price: 1.200,-



Conclusions

Tourists

- Tourists have a need for an alternative to transport their family and their luggage.
- Vrachtfiets is able to provide this service together with local actors, lucratively.
- Tourists are inspired by Vrachtfiets and 70% (questionnaire) is interested in using it instead of their car.

Holiday park

- The strategy for implementation of the whole system on the holiday park should carefully be considered.

Vrachtfiets

- The Vrachtfiets methodology has provided the project with adequate guidance.





ALL FRISIAN WOOD BIKE



PhD Arno Scheepens

PhD Satish
Beella

Concept

LINK



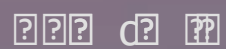
PSS-course # Design for Sustainability # Delft University of Technology

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???cA?????dA???



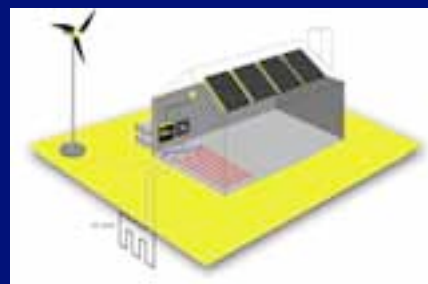
Small text or logo in the bottom right corner.

[illegible]

Charging Modes



Energy Reductie via Smart Grids - PhD Daphne Geelen



Home energy sharing networks

i.e. hohm & powermeter



Microsoft®
hohm

Bringing people together to save energy and money

Track and Plan

Save and Share

TU Delft

58

Google or Microsoft power meter

PhD Sonja van Dam

HEMs - Home Energy Management Systems



Manodo Sbox



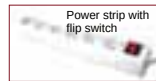
Building Dashboard®



Watson



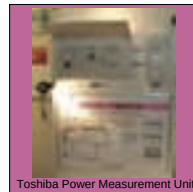
Tendril TREE™



Power strip with flip switch



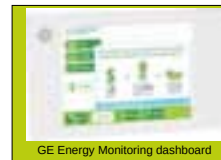
ONZO



Toshiba Power Measurement Unit



Ewgeco



GE Energy Monitoring dashboard



Delft
University of
Technology

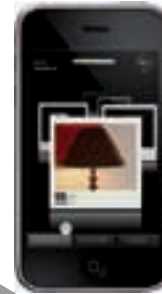
Challenge the future

Boosting Energy Awareness with mobile interfaces and real-time feedback



Smart technology and enlightened people

- a great combination for saving energy in the home

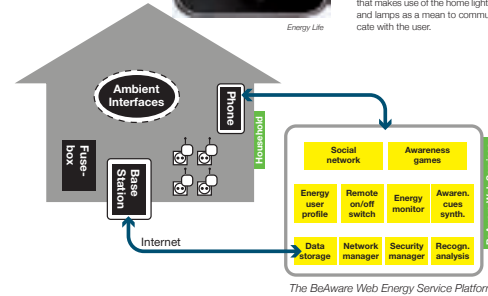


Energy Life

BeAware will develop ubiquitous, mobile, and ambient and web interfaces to provide cues to residents. The detailed and next-to-real time consumption information is collected through pervasive wireless sensing.

Cognitive capabilities and social practices are covered by game-like applications. *Energy Life* has been designed by BeAware to be an engaging and informational aid to the user. Users are encouraged to take actions in electricity conservation by making the consequences visible of their electric device usage with intuitive, real-time feedback. The application is a web-based solution for mobile phones. *Energy Life* includes an ambient interface that makes use of the home lighting and lamps as a mean to communicate with the user.

Source: BeAware EU



**Texel Island: adopt a LED outdoor
light**



Frisian solar challenge

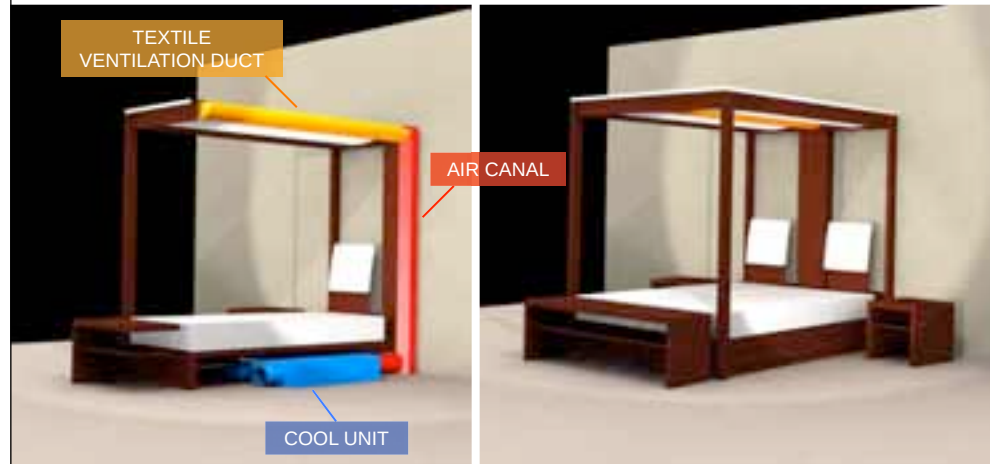
Study team



Solar power for electronics

You can work all the time





- NATURAL VENTILATION DURING THE DAY
- A COMFORTABLE AND COOL AIRCOTED DURING THE NIGHT
- ENERGY USE REDUCTION OF MORE THAN 60 PERCENT *!

*PER ROOM PER NIGHT



Sponsors: Creditz & RCI - Rotterdam Climate Initiative



FluxFloor

Sustainable Dance Club & Floor



© adrian deen

Trash into Treasure



*Turning waste into
sustainable and enjoyable applications
for Dierenpark Emmen next 'users'*

Graduation project of Lisanne Dölle









Design brief



Design an affordable lighting solution, of high quality, for the rural population of Cambodia.

Why?

- Only 12% connected to the power grid*
- People use a kerosene lamp*
- 55 % use car batteries*

Final design: Moonlight (Ampoul Preahchan in Khmer)

Features (see prototype)

- 6 wide angle LEDs, 40 lumen outcome
- Equivalent of 3-4 kerosene lamps
- Solar powered by 0.5 Wp solar panel
- Which can be fixed to bamboo pole 'anti theft'
- 2,5 hours of full lighting, 4 hours dimmed
- Feedback light for charging



Final conclusion

“Design, failures, successes, sustainability ambition
and music can go hand-in-hand”



Summer 2010



ProfB & the
Design Girls - SAIL
Amsterdam



76

Prof. Bernd Brügge

[HOME](#)



Software Engineering: How to deal with Failure

Bernd Brügge

*Applied Software Engineering
Technische Universität München
www.bruegge.in.tum.de*

Ars Electronica Festival, Linz
4 September 2010

Example of a Famous Design Failure: Tacoma Narrows Bridge in 1940



Another Famous Design Mistake: Vasa



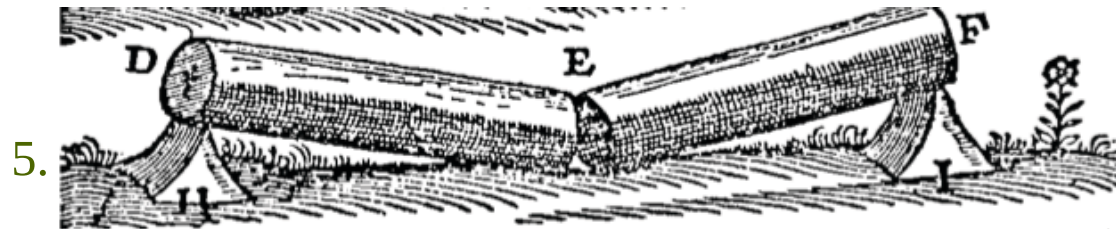
- Built in 1628
- The only well preserved 17th century warship

- The Vasa sank during the maiden voyage a few minutes after setting sail (the wind was stronger than expected)



Another Reason for Failure: Design Extensions

- Example (Galileo):
 1. A column is stored on two piles of timbers.
 2. A mechanic sees this and knowing how obelisks and ships could break under their own weight, fears that the column is dangerously close to breaking

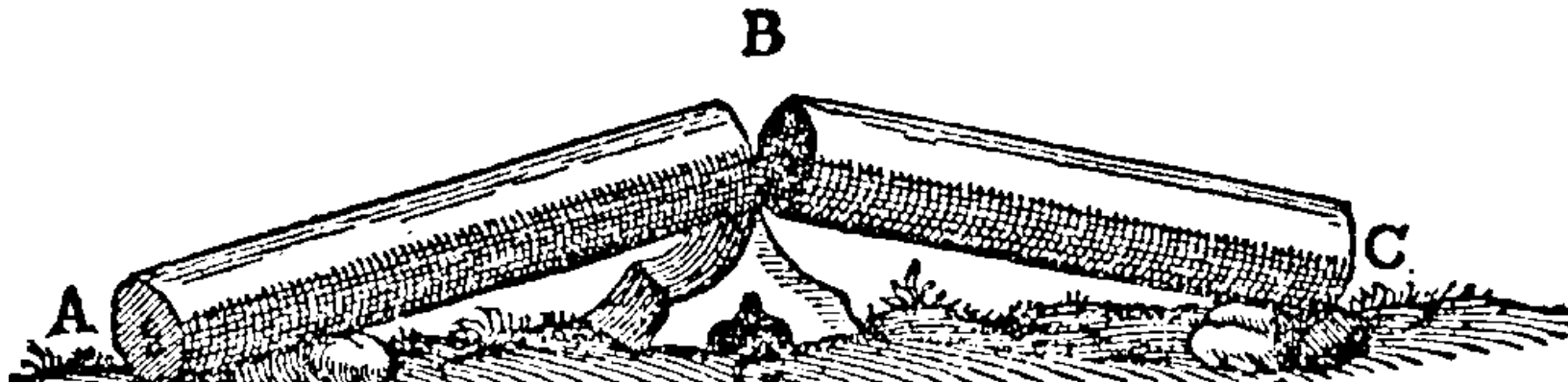


5.

7. He suggests to add support under the center of the column

From Galileo's
Dialogues,
Concerning Two New
Sciences

The unexpected Columns Failure



What had happened was that the freshly installed support did not settle as readily as the original ones, and the column was unable to support its own weight balanced on the single central support.

The fundamental question is:

How do we acquire and
describe software system
knowledge in the context of
complexity and change?

First Insight: Knowledge must be falsifiable

- Karl Popper (“Objective Knowledge”):
 1. There is no absolute truth when trying to understand reality
 2. One can only build theories, that are “true” until somebody finds a counter example
- **Falsification:** The act of disproving a theory or hypothesis
- The truth of a theory is never certain. We must use phrases like:
 1. “by our best judgement”, “using state-of-the-art knowledge”

Consequence for Software Systems

- In software engineering any system, including a user interface prototype, is a model, and thus a theory:
 1. We build models and try to find counter examples by:
 - Requirements validation, user interface testing, review of the design, source code testing, system testing, etc.
- **Testing:** The act of disproving a model
- Usability Testing: The act of testing a user interface



Second Insight: Failures are helpful

- Henry Petrovski's paradoxical approach to design:
 1. Better information comes from designs that fail than from those that succeed
 2. Reason: failures draw more scrutiny. Petrovski says without failure, complacency sets in.

Famous quote from Petrovski: „Success in Engineering is defined by its failures“

Challenges in Software Engineering

Approaches to Knowledge Management in Software Engineering

1. Patterns
2. Plan-based vs Situation-based Planning
3. Agile Methods

Patterns originated in Architecture

- Christopher Alexander's Philosophy:
 1. "Buildings have been built for thousands of years by users who where not architects"
 2. "Good buildings are based on a set of design principles that can be described with a pattern language"
 3. "Users know more about what they need from buildings and towns than an architect".



Christopher Alexander

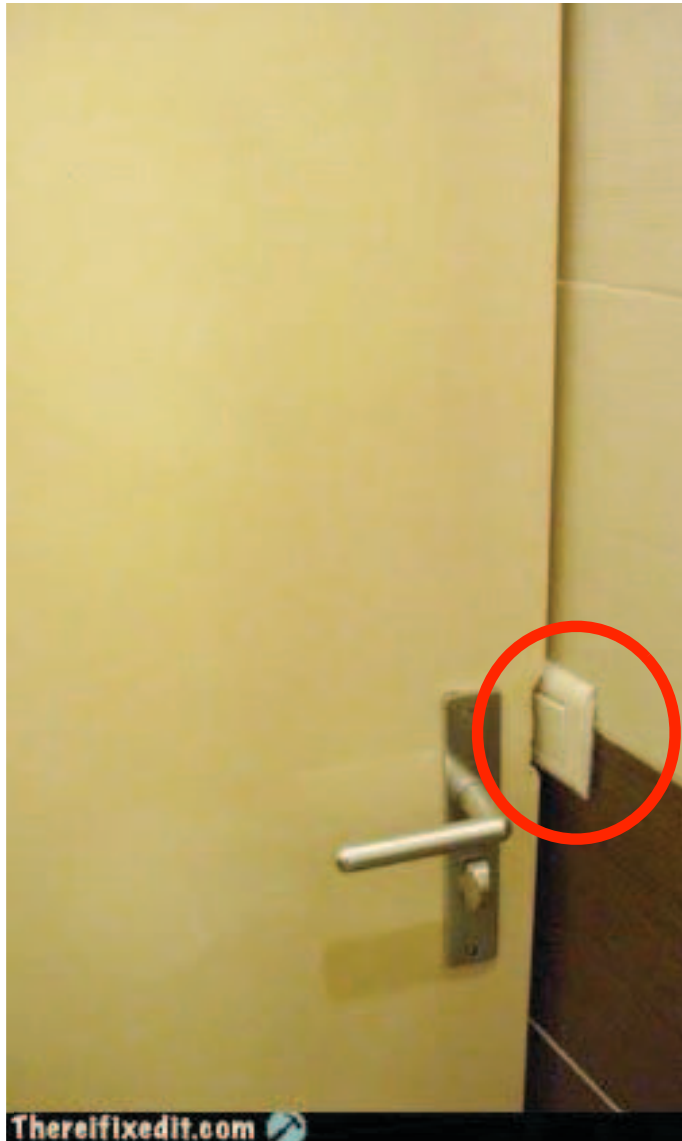
- * 1936 Vienna, Austria
- More 200 building projects
- Creator of the „Pattern language"
- Professor emeritus at UCB.

Winchester House <http://www.winchestermysteryhouse.com/>

- In San Francisco
- No architect was ever consulted, built on the advice of a medium
- Continuously built for 38 years
- Utter lack of master plan
 1. 160 rooms, including 40 bedrooms and 2 ballrooms, (one still under construction) 47 fireplaces, 10,000 window panes, 17 chimneys, 2 basements and 3 elevators
 2. Originally 7 floors, now 4



However: Today's Users need Architects.....



...Desparately



Thereifixedit.com
© 2010 Bernd Bruegge



Software En
Thereifixedit.com

What is this?

**1.Nf3 d5 2.c4 c6 3.b3 Bf5 4.g3 Nf6 5.Bg2 Nbd7 6.Bb2 e6 7.O-O
Bd6 8.d3 O-O 9.Nbd2 e5 10.cxd5 cxd5 11.Rc1 Qe7 12.Rc2 a5
13.a4 h6 14.Qa1 Rfe8 15.Rfc1**



This is a snapshot from the game Reti-Lasker, New York 1924

We can comment the situation as follows:

“Lasker has the center, but Reti has fianchettoed, so he has the advantage....”

Fanchetto: Basic building-block of chess knowledge



Called the
fianchetto: Usually
taught in books
about chess
openings

There is a pattern
behind this!

More elaborate comment in a newspaper chess column:
“We can see that Reti has allowed Lasker to occupy the centre
but Reti has fianchettoed both Bishops to hit back at this, and
has even backed up his Bb2 with a Queen on a1”

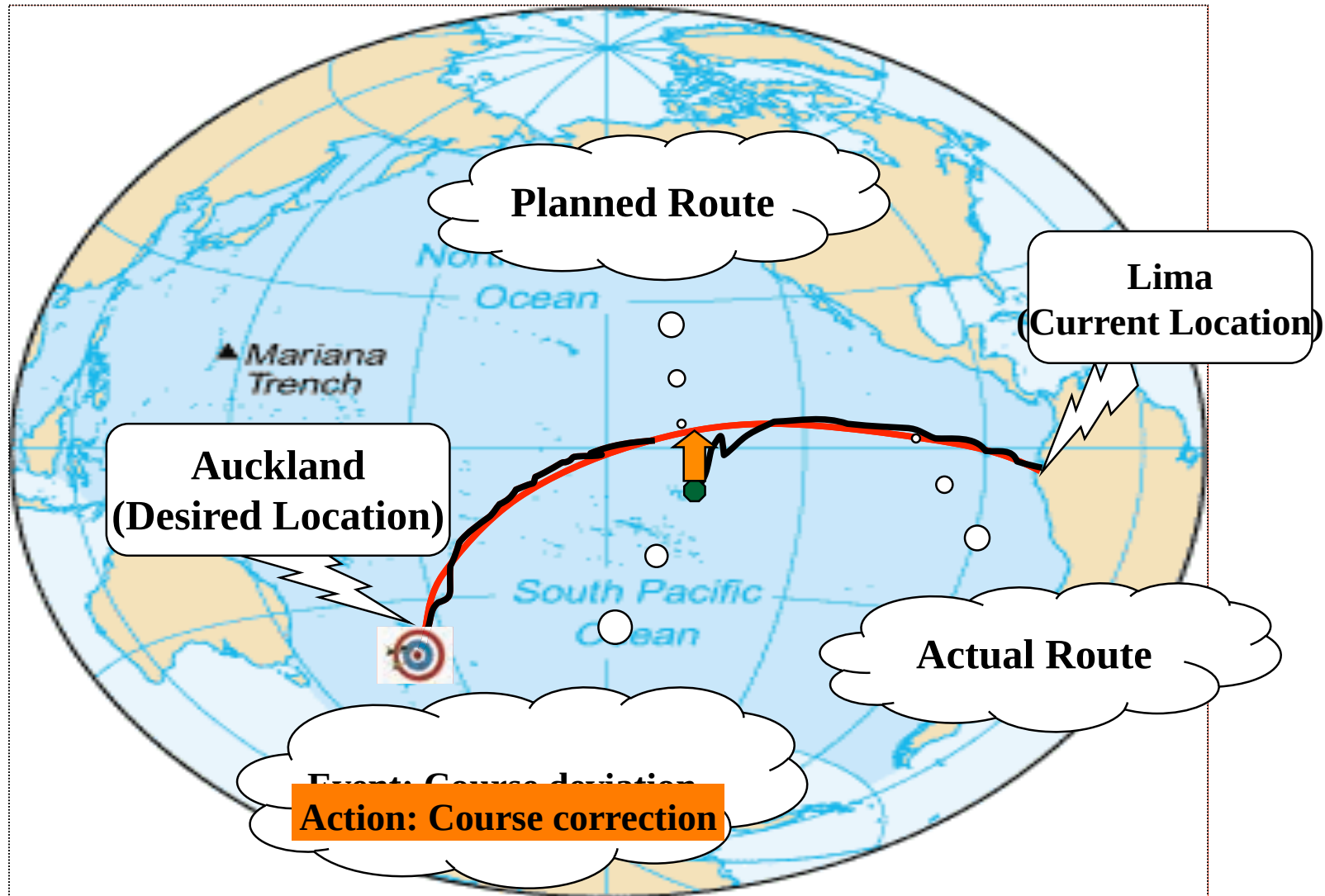
Challenges in Software Engineering

- How can we build applications that customers want before they know that they want them?
- How can we deal with complexity?
- How can we react to *changing* requirements?
- How can we react to *changing* technologies?

Approaches:

1. Patterns
-  2. Plan-based vs Situation-based Planning
3. Agile Methods

European Navigation (Plan-based)



Can we always hit the target?



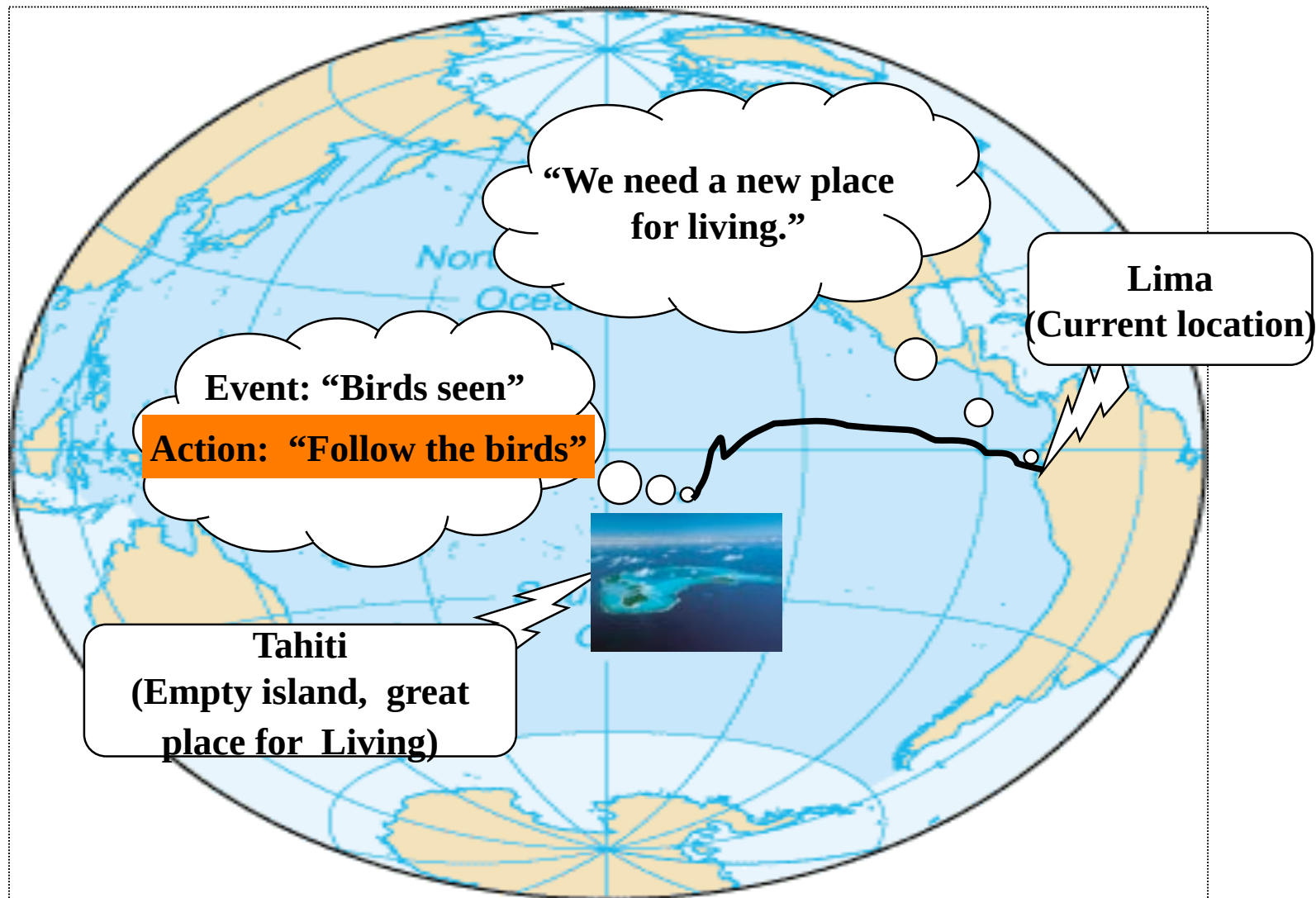
Can we always hit the target?



Can we hit the target when it is far away?



Polynesian Navigation (Situation-based)



Planning in Software Development

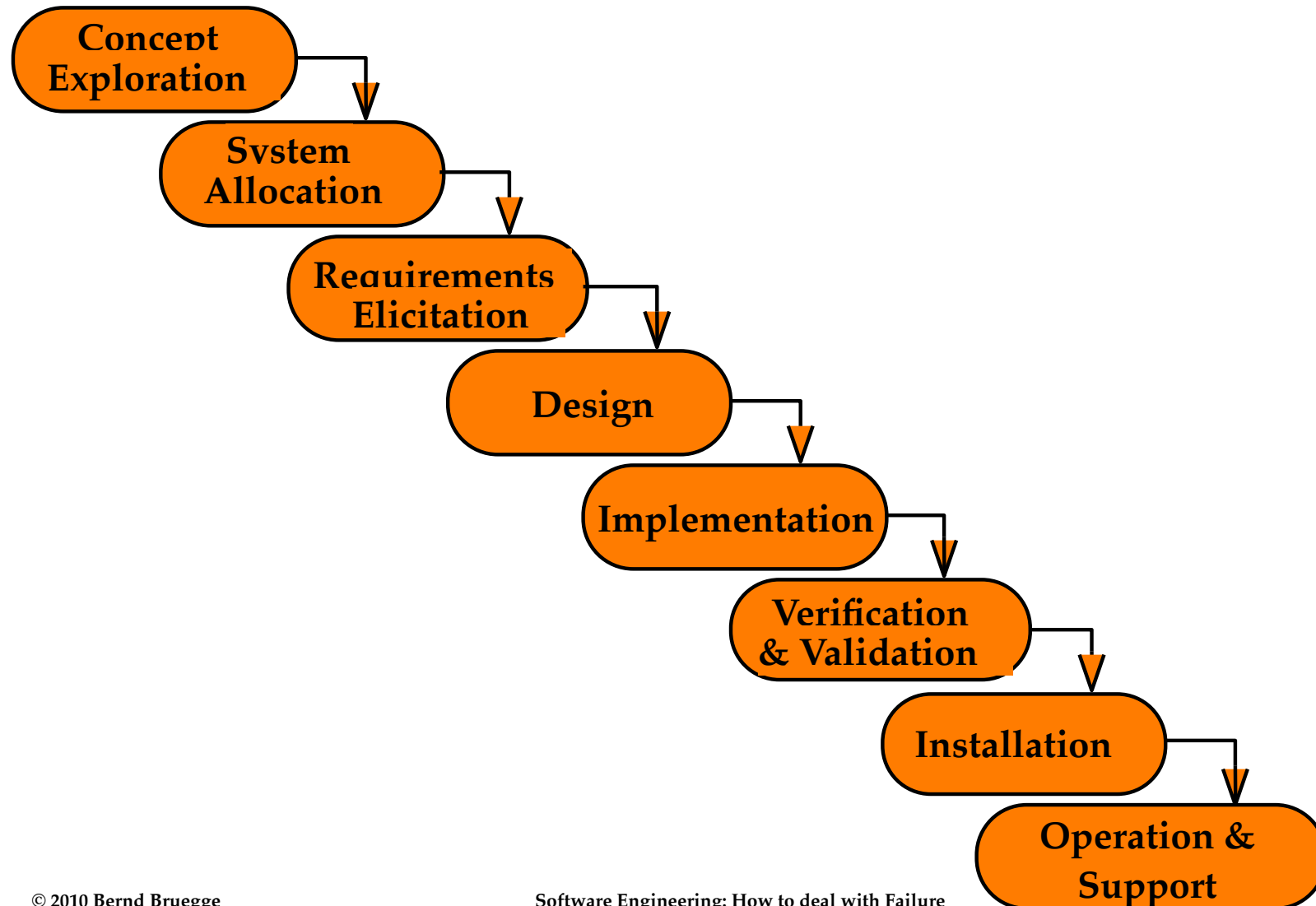
How do we control software development? Two opinions:

- Through **organizational maturity** (Humphrey)
 1. Defined process, Capability Maturity Model (CMM)
- Through **agility** (Schwaber):
 1. Large parts of software development is empirical in nature; they cannot be modeled with a defined process
- What is better?
 1. **Defined process** control model?
 2. **Empirical process** control model?

Defined Process Control Model

- Given a well-defined set of inputs, the same outputs are generated every time
- All activities and tasks are well-defined
- Deviations are seen as errors that need to be corrected
- Condition when to apply this model:
 1. Change is not frequent and can be ignored.

Example of a Defined Process Control Model: The Waterfall Model



red
yellow
green
blue
red
blue
yellow
green
blue

red
yellow
green
blue
red
blue
yellow
green
blue

The Waterfall Model is a Dinosaur



V-Model



Copyright © 1996 Joe Tucciarone and Jeff Poling

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Software Engineering: How to deal with Failure

Spiral Model



Empirical Process Control Model

- **Empirical process**
 1. An imperfectly defined process, not all pieces of work are completely understood
- Deviations, errors and failures are seen as opportunities that need to be investigated
 1. The empirical process “expects the unexpected”
- Control and risk management is exercised through frequent inspection
- Condition when to apply this model:
 1. Change is frequent and cannot be ignored.

Relay race: work is performed sequentially



Rugby: work is performed in parallel

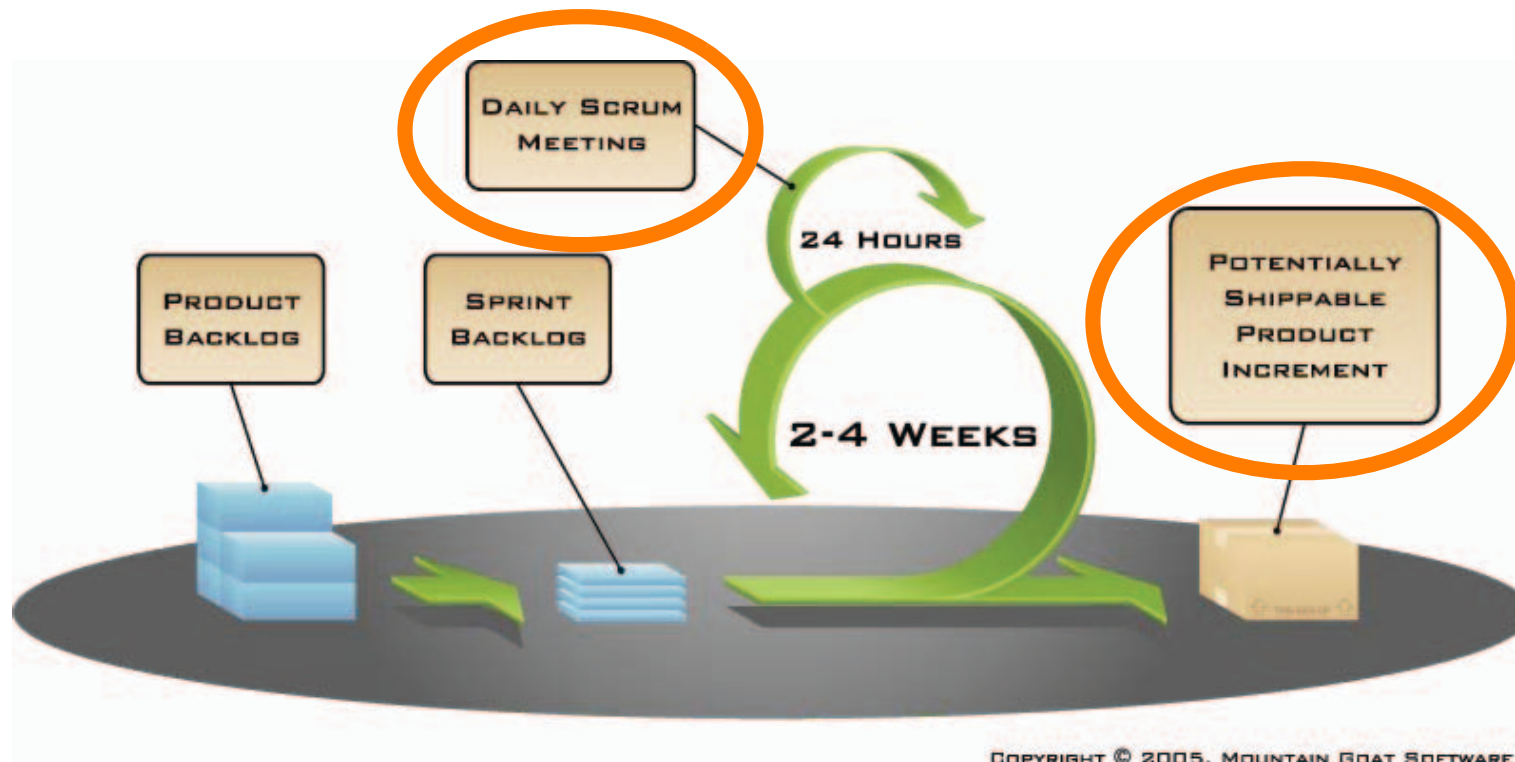


Scrum



- **Original definition in Rugby:**
 1. A Scrum is a way to restart the game after an interruption. The forwards of each side come together in a tight formation and struggle to gain possession of the ball when it is tossed in among them
- **Definition used in agile Project Management:**
 1. Scrum is a technique to manage and control software and product development when the requirements and the technology can rapidly change during the project.

Overview of Scrum



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Daily Scrum Meeting

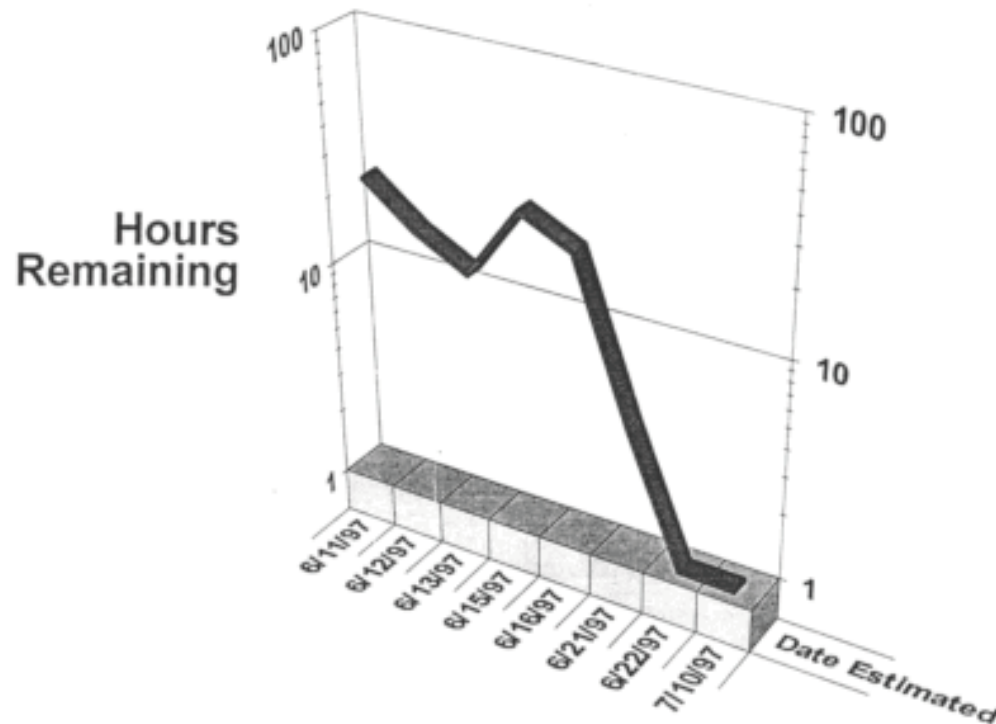


- A short (15 minutes long) meeting, held every day before the team starts working
- Every team member answers 3 questions:
 1. **Status:**
What did I do since the last daily Scrum meeting?
 2. **Issues:**
What is stopping me getting my work done?
 3. **Action items:**
What do I promise to do for the rest of the day?

Visualizing Progress: Burn down Charts

- X-Axis: time (usually in days)
- Y-Axis: remaining effort

Estimated Hours Remaining by Date

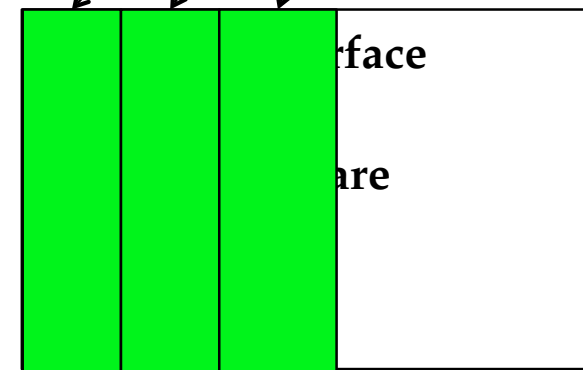
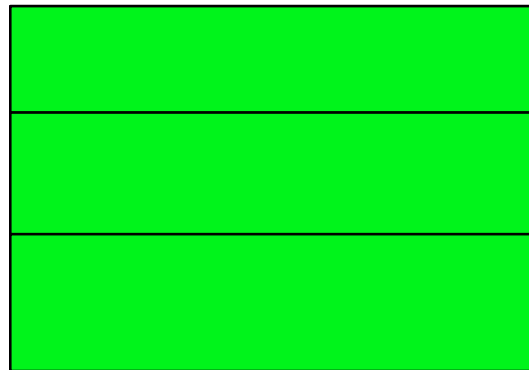
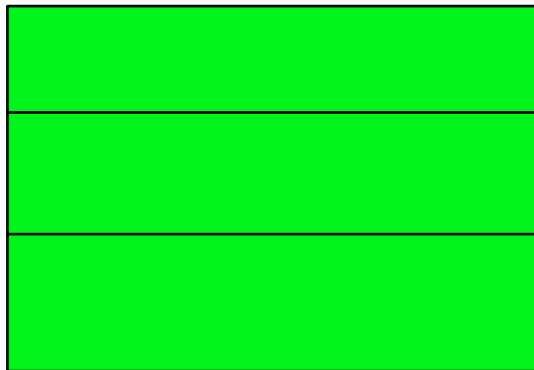


Potentially Shippable Increment

- Each sprint focuses on the creation of a working system
- Can be thrown away (“falsified”) or delivered
- The customer decides.



Traditional Approach:
System delivery after integration



Conclusion

- When solving problems, knowledge is often acquired by accidents or through failure
- Software development is problems solving
- Therefore we can apply Popper's concept of falsification during software development
 1. Any software system is a theory and thus is falsifiable
- Falsification should occur as soon as possible
 1. Defined process control methods make early falsification hard
 2. Empirical process control methods encourage early falsification by focusing on incomplete, but runnable systems
- Requires a new way of thinking for managers, developers and customers.

Backup Slides



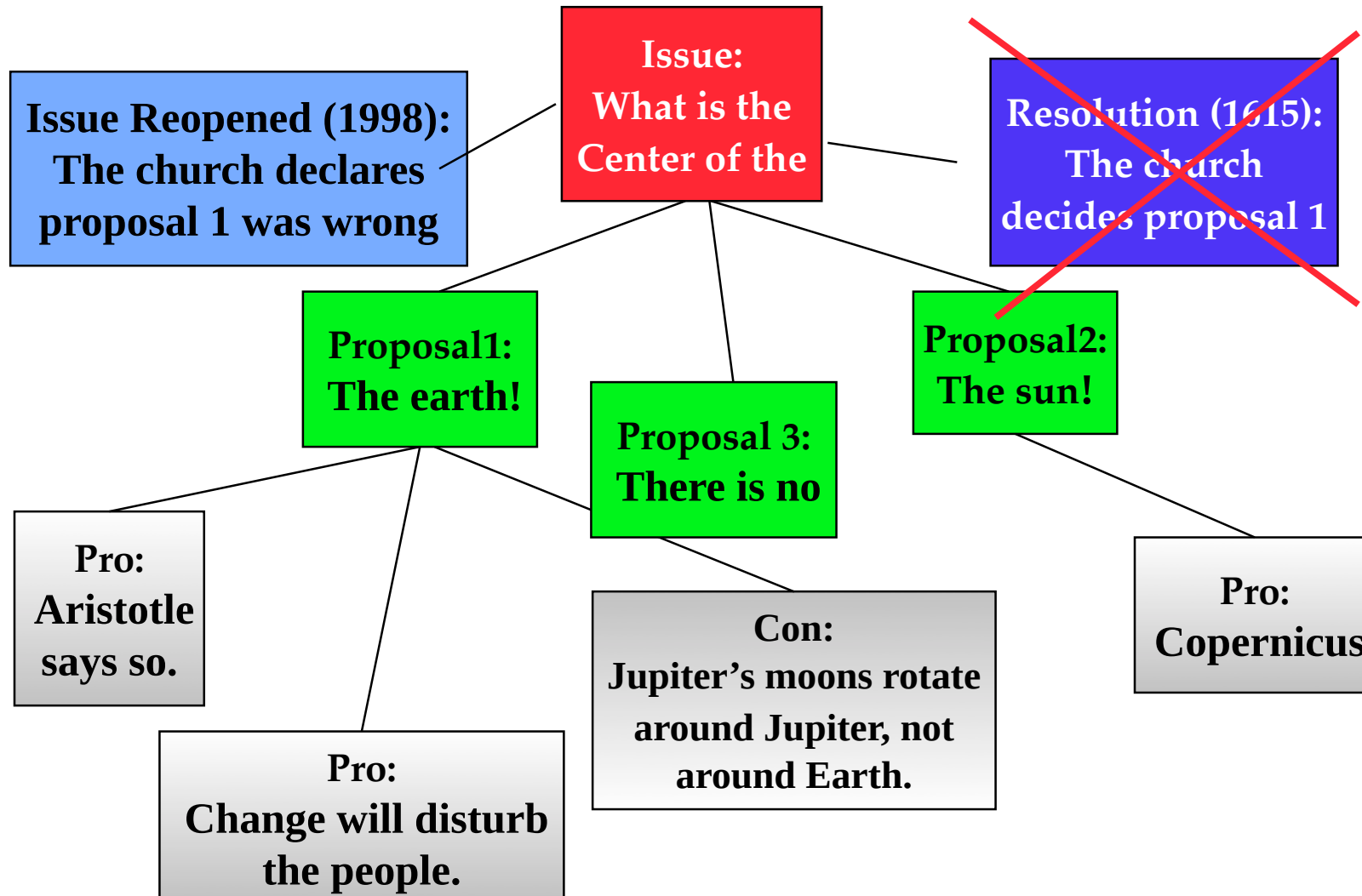
Example of a Long-Running Project

The issue: What is the center of the Universe?

1. Pope: "The earth is the center of the
"Aristotle says so".

- Galileo: "The sun is the center of the universe"
 - Why? "Copernicus says so".
 - Also, "the Jupiter's moons rotate round Jupiter, not around Earth".

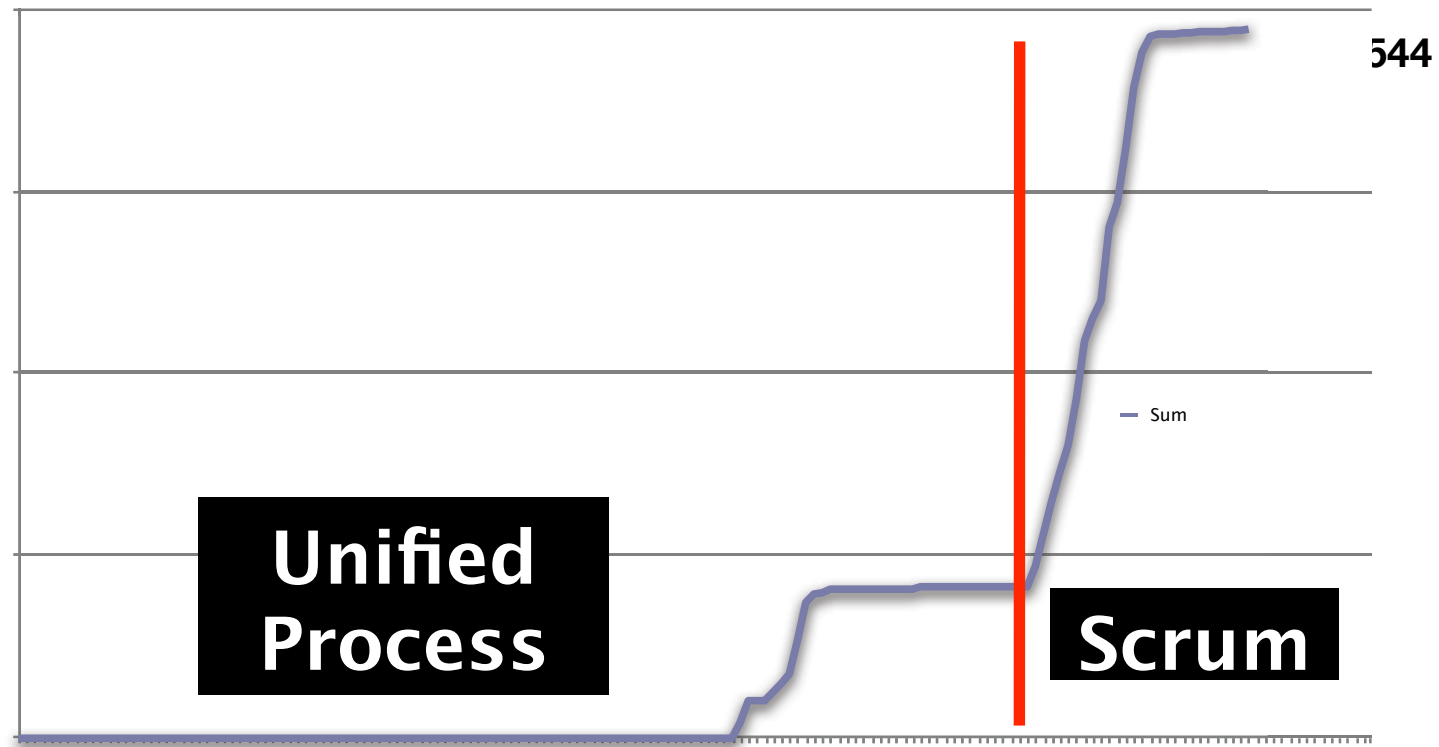
Issue-Modeling



Project Examples

- DOLLI (3 Months, WS 2007)
- WeWall (3 Months, SS 2010)
- WeMakeWords (3 Months, SS 2009)
- Pinocchio (6 Months, 2009-2010)

Number of Builds in DOLLI (3-Month Project)



WeWall Project

- Customer: Deutsche Telekom, Berlin
- The *WeWall* is a pinboard on your phone, shared with friends or colleagues.



**Ad hoc
meetings,
emo-
transmitter,
news channel**

WeWall: Scenario Film of an Early Prototype





WeMakeWords



Teaching
Young
Children
Chinese

Alice



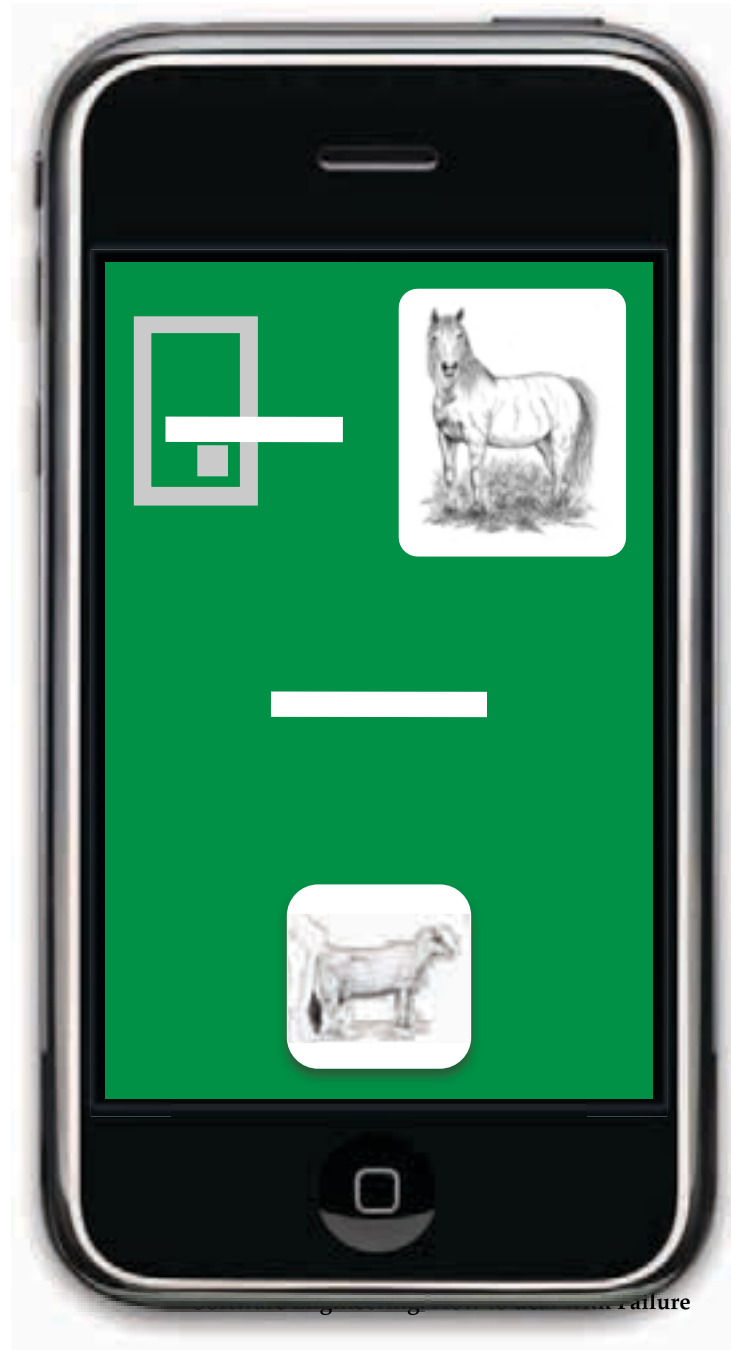
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Source: [http://www.fallure.com](#)

Alice



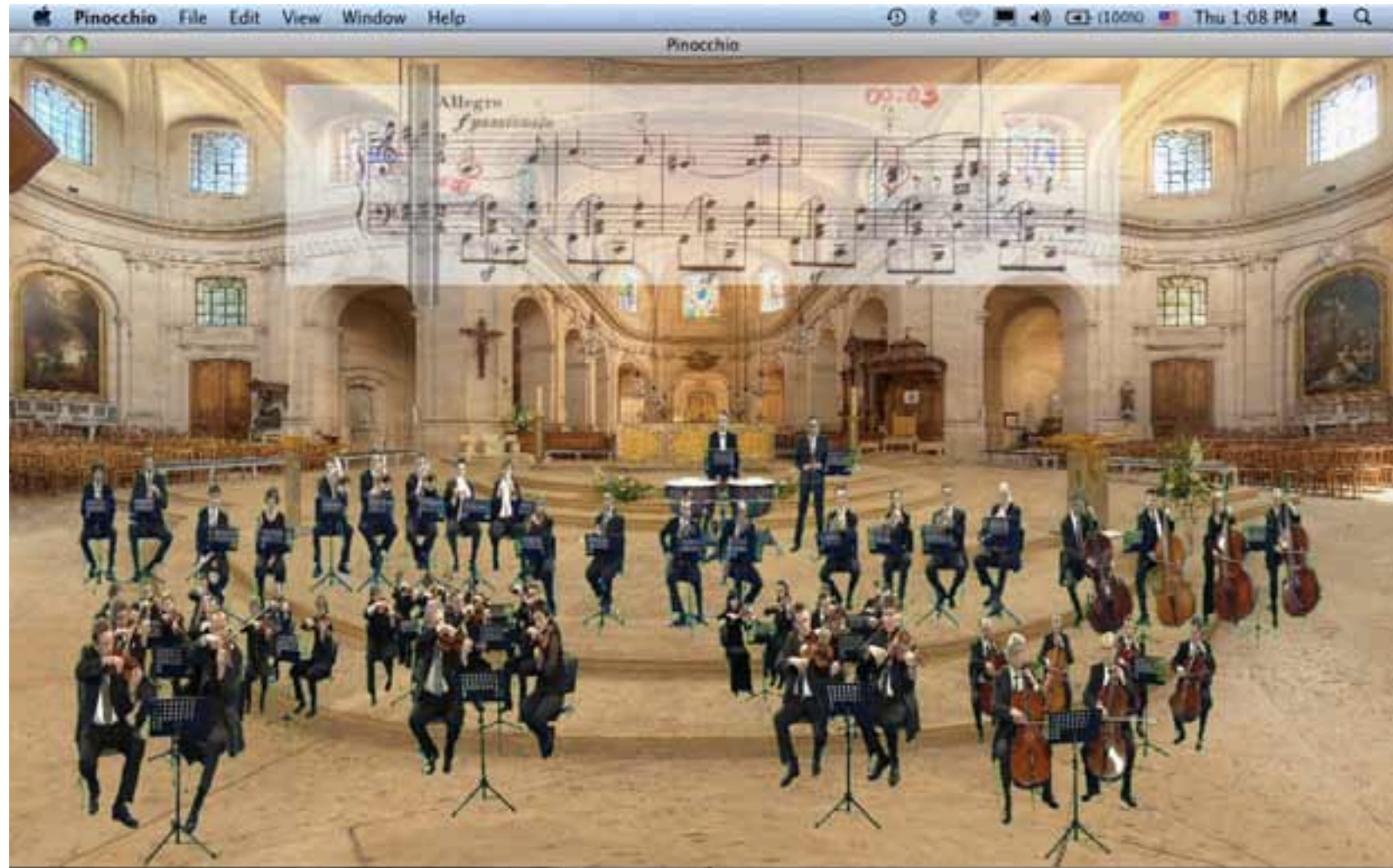
Alice



Usability Testing



Pinocchio: Virtual Symphony Orchestra Project





Open House of the Bavarian Symphony Orchestra



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- Henry Petroski, Engineering: History and Failure,
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Thank you for your

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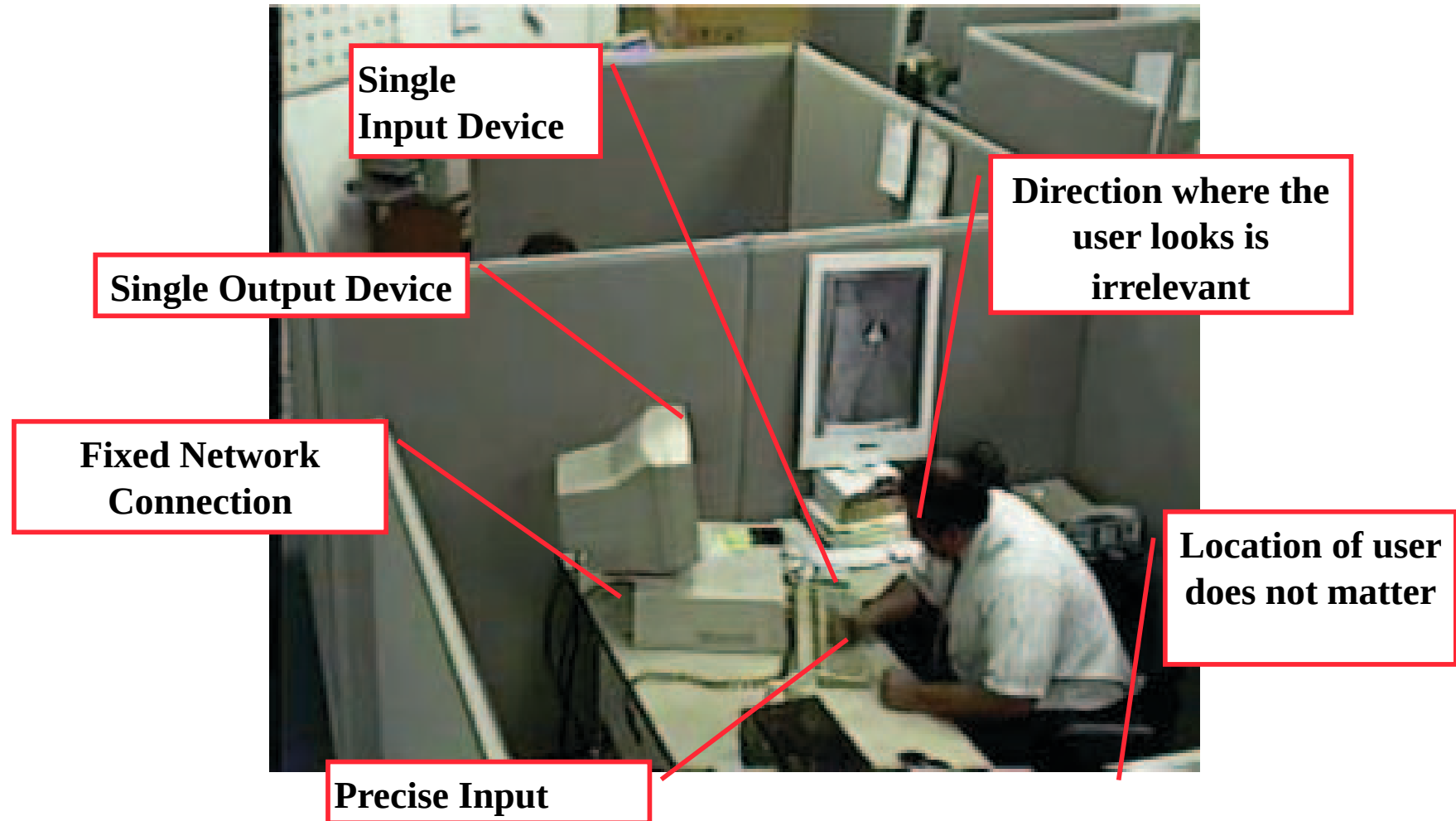
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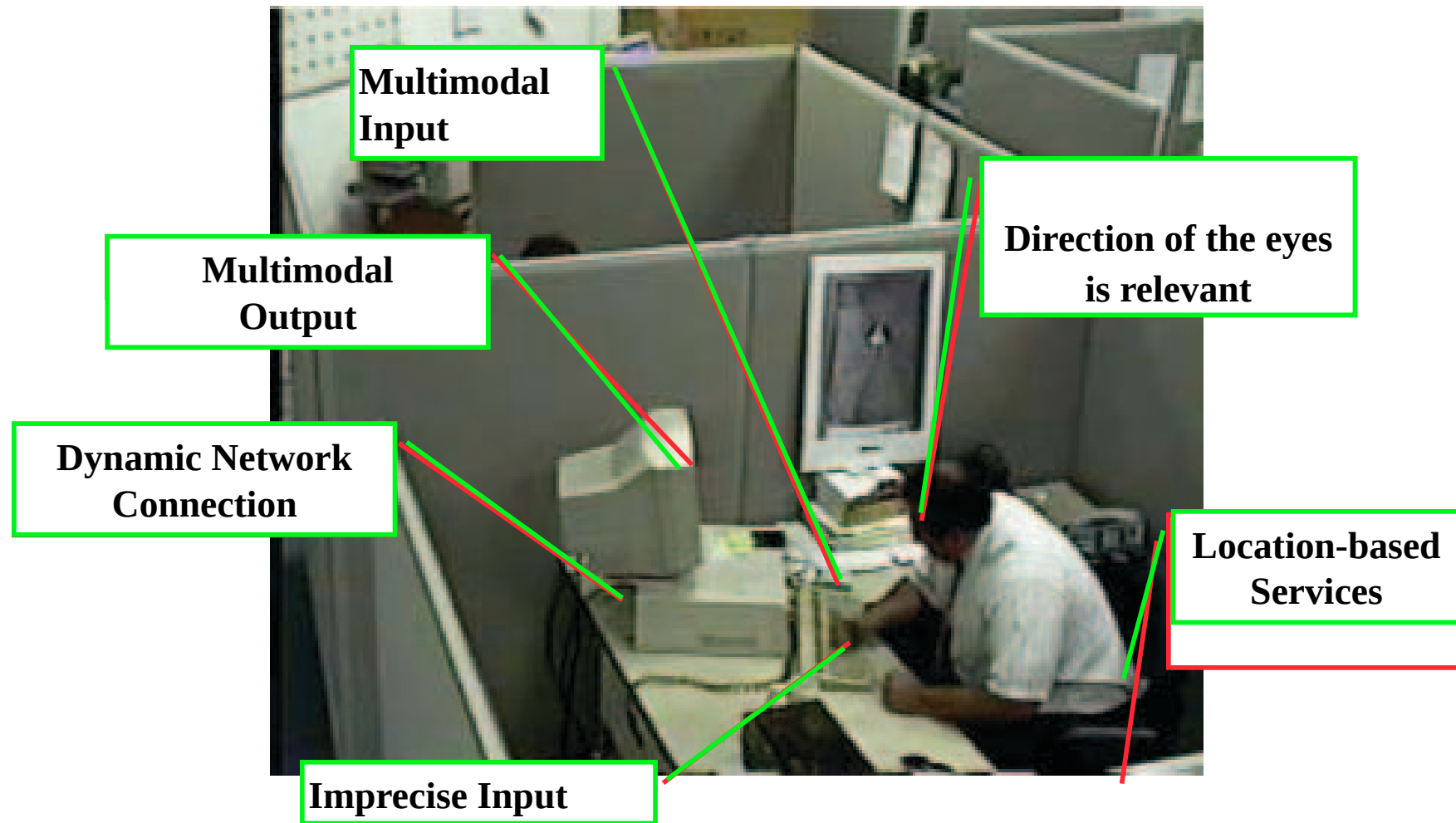
A Day in the Life of Joseph K.



The Old Way: Requirements for Desktop-based Systems



Requirements for Modern Systems



Winchester House <http://www.winchestermysteryhouse.com/>

- In San Francisco
- No architect was ever consulted, built on the advice of a medium
- Continuously built for 38 years
- Utter lack of master plan
 1. 160 rooms, including 40 bedrooms and 2 ballrooms, (one still under construction) 47 fireplaces, 10,000 window panes, 17 chimneys, 2 basements and 3 elevators
 2. Originally 7 floors, now 4



Software Development is a Complex System

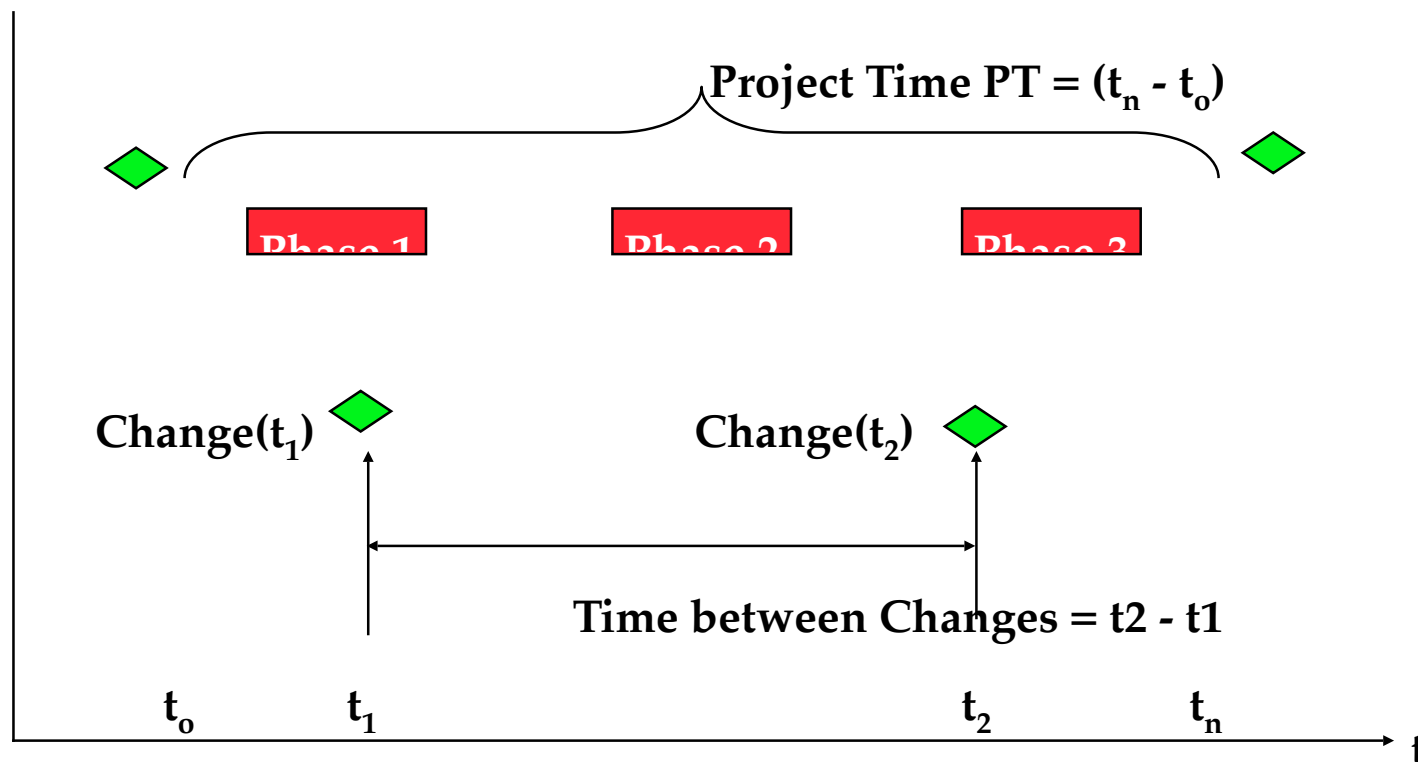
- As Software engineers, we have developed methods to model complex and changing systems
- Controlling Software Development itself can be seen as a complex and changing system.



Norman Rockwell – “Triple Self Portrait”

Frequency of Change

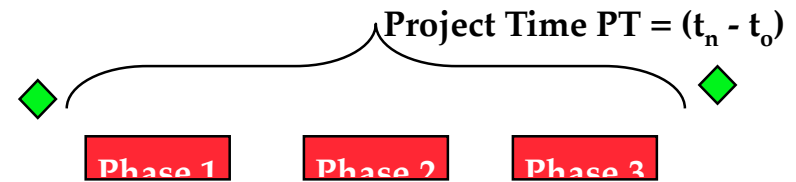
- PT = Project Time
- MTBC = Mean Time Between Changes



Change influences Choice of Process Model

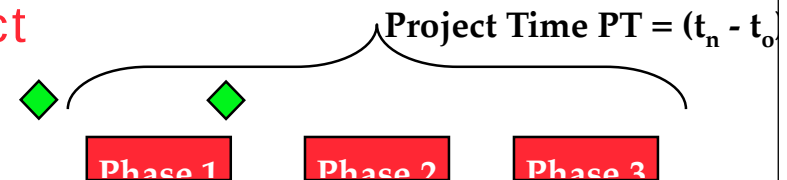
- **No change during project** (MTBC $\gg$ PT)

- Waterfall model, V-model
- Open issues closed before next project phase



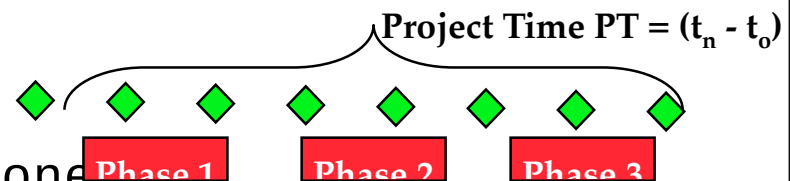
- **Infrequent changes during the project** (MTBC $\approx$ PT)

- Spiral model, Unified Process
- Changes in a phase can lead to repetition of phase or cancellation of project



- **Changes are frequent** (MTBC $\ll$ PT)

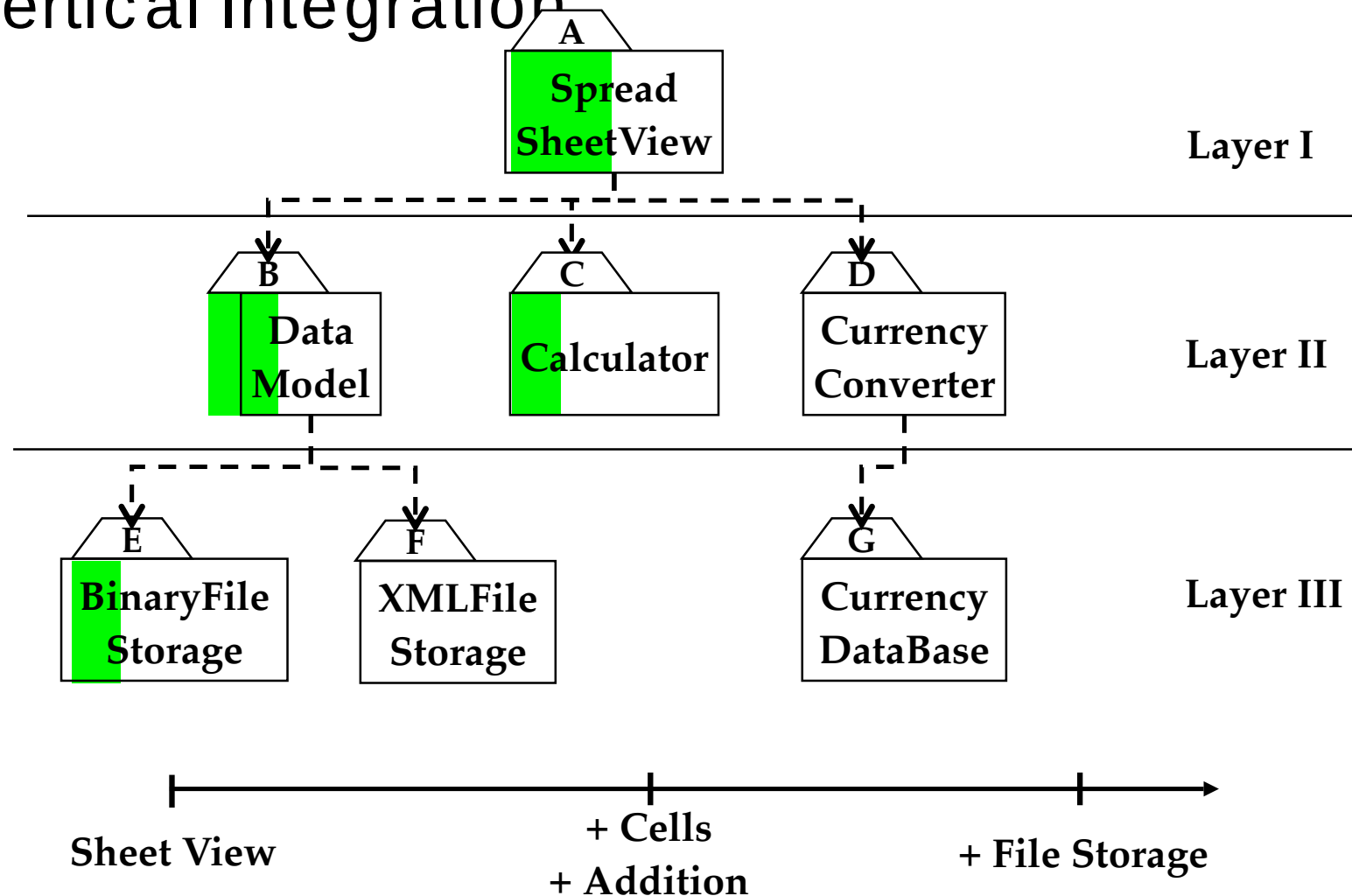
- Development phases are never done, parallel activities
- „The only constant is change“



Building Potentially Shippable Product

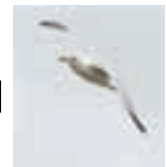
CruiseControl at atbruegge11 [3/5/08 11:21 AM]					
Project	Status (since)	Last failure	Last successful	Label	
fmg.dolli	waiting (11:16 AM)	11:15 AM	11:00 AM	build.334	Build
fmg.dolli.util	waiting (11:16 AM)		10:39 AM	build.2	Build
fmg.dolli.fmgbridge.live	waiting (11:16 AM)		4:46 PM	build.1	Build
fmg.dolli.positioning.positionadapters.tofuadapter	waiting (11:16 AM)		6:16 PM	build.5	Build
fmg.dolli.positioning.positionadapters.demosadapter	waiting (11:16 AM)		6:16 PM	build.2	Build
fmg.dolli.positioning.positionadapters.wlanadapter	waiting (11:16 AM)		11:38 PM	build.11	Build
fmg.dolli.positioning.positionadapters.gpsadapter	waiting (11:16 AM)		6:17 PM	build.2	Build
fmg.dolli.positioning.test	waiting (11:16 AM)		3/3/08	build.1	Build
fmg.dolli.informationbroker	waiting (11:16 AM)		3:34 PM	build.31	Build
fmg.dolli.webservices.axis2.libraries	waiting (11:16 AM)		10:25 PM	build.5	Build
fmg.dolli.itfieldservice.installer	waiting (11:16 AM)		11:44 AM	build.17	Build
fmg.dolli.positioning.facade	waiting (11:16 AM)		6:17 PM	build.2	Build
fmg.dolli.itfieldservice.entities	waiting (11:16 AM)		10:40 AM	build.55	Build
fmg.dolli.rfid.entities	waiting (11:16 AM)		1:13 PM	build.18	Build
fmg.dolli.simulation	waiting (11:17 AM)		11:17 AM	build.57	Build

Continuous Testing Strategy: Vertical Integration



Situated action

- Context-dependent action [Suchman 1990]
 1. Selection of action depends on the type of event, the situation and the skill of the developer
- **European Navigation is context independent**
 1. Event: “Course deviation in the morning”
 - Action: “Course correction towards planned route”
 2. Event: “Course deviation in the evening”
 - Action: “Course correction towards planned route”
- **Polynesian Navigation is context dependent**
 1. Event: “Birds seen”, Context: Morning
 - Action: “Sail opposite to the direction of the birds”
 2. Event: “Birds seen”, Context: Evening
 - Action: “Sail in the direction of the birds”.



Prof. Gunnar Heinsohn



Central Banks as Pushers of the Financial Crisis

Gunnar Heinsohn

ARS ELECTRONICA FESTIVAL

Linz / Austria, Gruberstr. 1, A-4020

2 - 11 September 2010

September 5th , 10:15 – 11:00 pm

In need of a new macroeconomic theory?

"We do have very elaborate macro economic models. They just suffer from one disadvantage. **They do not include the financial sector.**"

Peter Bofinger¹



"Large swaths of economics are going to have to be rethought on the basis of what's happened."

Larry Summers²



1. Since March 2004 member of Germany's council of five economic sages reporting to the government 2. Head of the National Economic Council for President Barack Obama

Sources: Frankfurter Allgemeine Sonntagszeitung, 17 May 2009, p. 35, Newsweek, March 2, 2009, p. 18

Near-Zero Interest Drama's First Act

Where, in 1995, does the near-zero interest money go that leaves the *Bank of Japan* but does not reach the companies for which it was intended?

1985/ 06 395.00

1986/ 06: 3.50

1987/ 06: 2.50

1988/ 06: 2.50

1989/ 06: 3.25

1990/ 06: 5.25

1991/ 06: 6.00

1992/ 06: 3.75

1993/ 06: 2.50

1994/ 06: 1.75

Discount rates of *Bank of Japan*

1989: NIKKEI at 39,000

1995: NIKKEI at 15,000

1995/ 06 1.00 %

1996/06 0.50%

1997/06

0.50%

1998/06

0.50%

1999/06 0.50%

2000/06

0.50%

2001/06 0.25%

2002/06 0.10%

2003/06 0.10%

2004/06

0.10%

2005/06

0.10%

2006/07

0.40%

2007/02 0.75%

2008/12

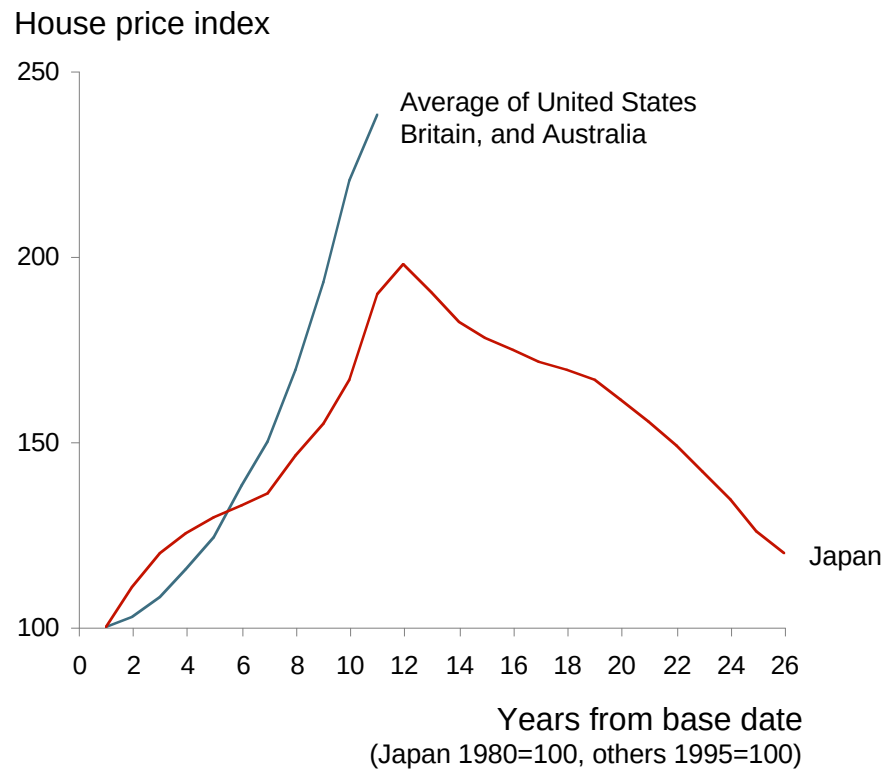
0.30%

2009/03

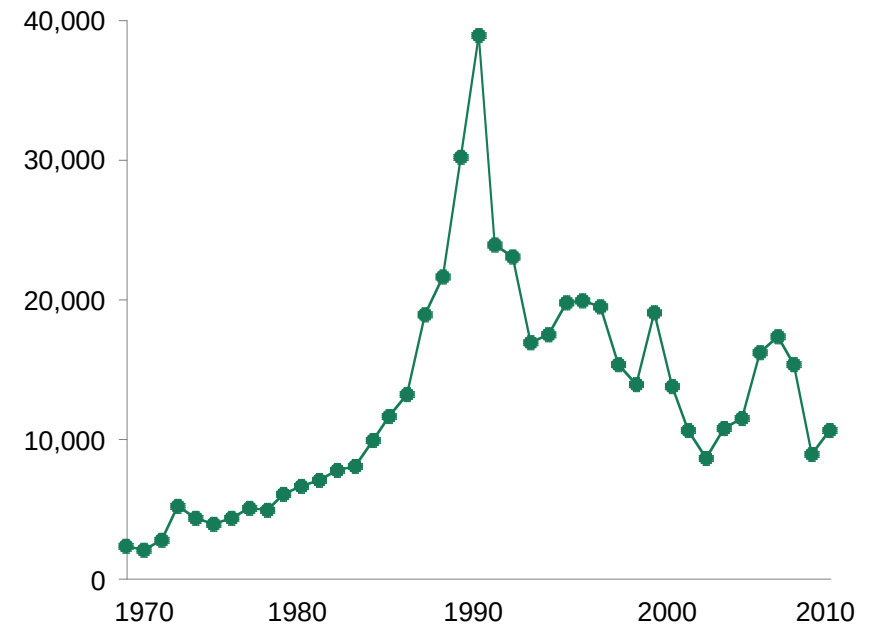
0.30%

Japan's crash of 1989 and the effect on house prices and equities

House prices



Nikkei



Whence Japan's abundant but risky cash flow?

TIMSS: Global Math ranks for 10-year-olds in 2007

1	Hongkong		607
2	Singapore		589
	[East-Asian Americans		582]
3	Taiwan	(Property installed 1953)	
	(extrapol. also P R of China; Property 1978-2003)		576
	[South-Korea (rank 3:2003)	Property 1949)	
4	Japan	(Property 1871)	568
.....			
7	United Kingdom	(Property 1381)	541
.....			
12	Germany	(Property 1811)	525
.....			
20	Armenia		500
.....			
30	Columbia		355

Average IQ of the highest five percent (95th percentile) of nations with at least 120.

The innovative potential

[Average IQ of 95th percentile in a total of 90 nations: 111.21]

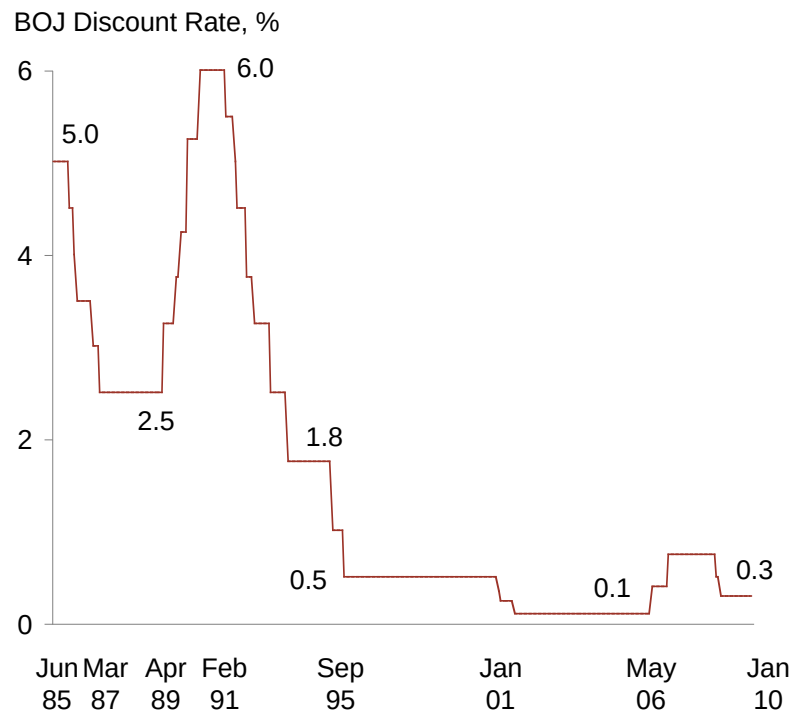
1. Singapore:	127.22
2. South-Korea:	125.25
3. Japan:	124.30
4. New Zealand:	122.65
5. Taiwan:	122.57
6. Kasakhstan:	122.11
7. Australia:	121.94
8. United Kingdom:	121.92
9. Hongkong:	121.54
10. Lichtenstein:	121.22
11. Finland:	120.92
12. Estonia:	120.76
13. Canada	120.32
14. USA:	120.30
15. Switzerland:	120.07

Seven more nations higher than 119.00 (Austria, CZ, Germany, Hung, IRL,NL, Sweden)

Source: H. Rindermann, M. Sailer, J. Thompson, „The impact of smart fractions...“, in *Talent Development & Excellence*, Bd. 1, Nr. 1, 2009, 3-25

Japan's central bankers were awestruck after they had failed to flood the "real economy" with fresh money

Always "hoping for the best"



- **In 2002, the Bank of Japan increased the money supply to commercial banks by 28.6%**
- **Yet, the money supply reaching the nation's companies and their workers merely grew by just 3.2%**

What happened? The BoJ had not taken to heart **1996** insights of property economics.

- "Attempts by the central bank to alleviate refinancing (through lowering its discount rate) is doomed to failure because the bank is in no position to provide the potential debtors with collateralizable property that they always have to pledge to commercial banks to obtain credit"¹

The price of potential collateral has drastically fallen. Outstanding debt, however, remains fixed.

Futility of zero interest of the Bank of Japan

„Later researchers found **little evidence of any boost** [of BoJ's discount slashing] **to overall lending.**“

(Mure Dickie, in *Financial Times*, 18-12-2008, S. 2.)

BoJ-Chef President Masaaki SHIRAKAWA,

15 December 2008:

“Ultra-loose monetary policy in the years [2001] to 2006, when interest rates were zero, had helped stabilise the banking system but had **done little to stimulate growth** [in the economy at large].” (*Financial Times*, p. 3.)

Loan sharks doing well!

In 2002, when Japanese central bankers were desolate that their 0.1% interest money did not reach Japanese companies, they simultaneously had to watch in bewilderment and awe that these companies approached credit sharks demanding a rate 200 times higher (20%).

What did the sharks do that the commercial banks could not do?

The sharks were ready to loan without demanding collateral. They did not have to regret this because – back then – the massive cash flow into the coffers of Japanese exporters kept them viable. Japan's industrial giants may not be able to repeat this way out in 2009/2010 because their potential clients try to do the same thing.

What commercial and central banks CANNOT DO for crippled companies

- >They cannot hand over property to be used as collateral to secure fresh credit. Yet, a crash begets insolvency and not merely shortfalls off liquidity.**
- >They cannot hand over patented innovations that could turn them into market leaders pricing down the competition**
- >They cannot hand over skilled workers that could implement such innovations to generate the cash flow to pay debt, thereby redeeming collateralized property and saving the company**

Is there a last provider of property/collateral?

In a crash asset prices fall—including the prices of assets in own capital.

Such a price decrease turns loans into toxic assets because debtors' collateral securing them has fallen in price too whereas the sums they owe do not fall with them.

Neither a commercial bank nor a central bank can provide debtors with fresh collateral, i.e. with unencumbered property.

Only a government may serve as a last provider of property, i.e. of capital. Central banks merely can create liquidity and the dangers coming with it.

Were politicians better prepared than central bankers?

Tony Blair,

Prime Minister of the United Kingdom from 1997 to 2007:

“Politicians failed. Monetary policy failed. Debt became way too cheap. But that was not a conspiracy of the [commercial] banks. It was a consequence of the apparently benign confluence of loose money policy and low inflation.”

From: “A Journey”, presented September 3, 2010

Collateral-clobbered companies cannot get zero-interest money, commercial banks, however, must take it.

**Charles „Chuck“ PRINCE, Citigroup CEO, 10 July 2007 –
before the crash (*Financial Times*):**

„When the music stops, in terms of liquidity, things will be complicated. But as long as the music is playing you’ve got to get up and dance. We are still dancing.“

Misguided altruism of central bankers triggered irrational behaviour (“greed“) of commercial bankers!

Walter Bagehot's fear of the dancers

Walter Bagehot (1826-1877):

Lombard Street (1873):

“First. That these loans [to solvent albeit momentarily illiquid banks] should only be made at a very high rate of interest. This will operate as a heavy fine on unreasonable timidity, and will **prevent the greatest number of applications by persons who do not require it.**”

Dangers for “persons who do not require it” (Bagehot).
Shy of capital but charmed by liquidity!

Zero-interest seduces commercial banks to **increase debt for investment without increasing “expensive” own capital.**

The resulting overexposure leads to:

- > **Criminally hiding risk**
- > **Legally spreading risk** by selling it globally
- > **Legally insuring risk** [with too many fires bringing down the insurance companies]
- > **Obliquely hedging risk** through derivatives
- > **Rehypothecation**, i.e. post as collateral for own deals collateral received from debtors, resulting in just one collateral supporting several contracts. Singh/Aitken [*IMF*, July 2010] estimate \$4,500 bn fresh funding through rehypothecation up to 2007.

**Thus, it is near-zero interest that causes the tarantella
you can only leave by dropping dead.**

GREENSPAN'S 1996 Exuberance Surprise

after 18 months of near-zero interest of the Bank of Japan

5 December 1996:

BoJ fund rates 1 % since 06/95, 0,5% since 06-96:

“How do we know when irrational exuberance has unduly escalated asset values, which then become subject to unexpected and prolonged contractions as they have in Japan over the past decade?”

Inside Japan it is that innovative nation's global cash earnings of the 1980s that inflates asset prices. The rest of the world, in the 1990s, experiences a genuine innovation boom (dotcom) that is additionally pushed by Japan's *monetary dumping* since 1995 (carry trades)

What did the Bank of Japan not understand?

Money, interest, companies, and markets—the entire system!

- **Interest** is not the compensation for the loss of present consumption of goods that is valued higher than their future consumption. Goods are never loaned in credit.
- **Money** is not a standard good to reduce the transaction costs of bartering goods.
- **Markets** are not ever-present locations where goods are exchanged with the help of a standard good "money" to the mutual benefit of their possessors.
- **Companies** are not endowments of physical goods that are exchanged—thereby creating the market—until all parts have been assembled into something useful.

“The question why there is a rate of interest was never answered by the discipline of economics.

This burdens the economist with a moral problem which he cannot escape.”

Hans-Christoph Binswanger¹



All these definitions are tied to the eternal world of possession and its physical goods that even bees and beavers use for production. They have nothing to do whatsoever with the world of business which takes places in the non-physical world of property

1. Professor Emeritus of Economics, University of St. Gallen.
Source: Die Zeit, 17 February, 2003

Where do markets and money come from?

“Supposedly out of the facilitation of bartering goods, i.e. of

“a certain propensity in human nature ...; the propensity to truck, barter and exchange one thing for another. Nobody ever saw a dog make a fair and deliberate exchange of one bone for another with another dog. Nobody ever saw one animal by its gestures and natural cries signify to another, this is mine, that yours; I am willing to give this for that” (Adam Smith [1723-1790], 1776).

No way! “In such a community the idea of profit is barred; higgling and haggling is decried; giving freely is acclaimed as a virtue; **the supposed propensity to barter, truck, and exchange does not appear.** The economic system is, in effect, a mere function of social organization” (Karl Polanyi [1886-1964], 1944).

“Barter, in the strict sense of moneyless market exchange, has never been a quantitatively important or dominant model of transaction in any past or present economic system about which we had hard information. / Moneyless market exchange was not an evolutionary stage ... preceding the arrival of monetary means of market exchange” (George Dalton [1926-1991], 1982).

Transformation advisors not smarter than central bankers

Hired to assist Poland's farewell to state socialism Jeffrey SACHS—as a market economist—expected everything from liberalizing prices and markets. Money, he thought, has already been there. He had no idea that it is a derivative of property. Therefore, he wanted to leave the establishment of property for the end of transformation:

«Taking the final step of transforming the state's property into private property.»

(Poland's Jump to the Market Economy, Cambridge, MA: MIT Press, 1993, p. 80.)

Yet, there was no such thing as “state property“. There was only state possession. There were no commercial banks in Poland . The state bank had no resemblance whatsoever to a central bank—being the commercial bank for all the commercial banks. Thus, the branches of the state bank handed out zloty and demanded interest. Clients were happy. Yet, 12 months later many of them failed to pay back. The banks did not know what to do. They fired the neoclassical advisers and called in common bank experts to teach them:

«Lesson 1: In the new economy, ask the borrowers for collateral.»

R. W. Stevenson, "Poles Forge Private Bank System. Experience Is Scant, Save for Bad Loans",

**Since collateral is nothing but property you must first create property
when you want to have money and markets !**

Lucretius (99-55 BCE)

“Later, after [the rule of the feudal estates] came private **property with the coined money** [“gold”] under which even the strong and the beautiful were quickly deprived of their former honours“
(*De rerum natura*, V: 1113-1114).

“The manner in which **loans** became so mighty a machine is **mysterious**”

(**Chester G. Starr** [1915-1999] 1977, 183).

Interest—as well as the entire economic system—looks incomprehensible because the difference between possession and property is not tackled

Possession

Possession is the basis of material reproduction in systems based on:

- reciprocity (tribal community)
- or command (feudal/socialist lordship)

These systems do not know property. Only possession does exist

The rules of possession determine the right to physically use goods and resources or change their substance and form regarding:

- who has this right and who is excluded from it
- in what manner this right can be applied
- at what time and place it can be applied
- to what extent it can be applied

Property

Property guides material reproduction only in the property society

Property exists in addition to possession

Only property allows for genuine economic, i.e. business operations:

- to **burden property** titles in issuing money against interest
- to **encumber** these titles as collateral for obtaining money as capital
- to alienate through **sale and lease**
- to **enforce**

Property rights transform possessory rules into possessory rights regulated by law

Property rights transform goods and resources into money priced commodities and assets

Only PROPERTY OPERATIONS are business operations

The ownership side of property provides the owner with important rights and operations over commodities and assets. This includes the **power to sell** property (transfer of title), the **power to burden** property (the reservation of property to back a money note issue), the **power to hypothecate** property (as security in a loan contract, also a form of burdening) and the **power to enforce** rights against property in debt recovery actions.

Economically of greatest importance is the ability to burden property to back money when created and the hypothecation of property to obtain credit.

Commodities and assets differ in the degree to which they can be used in this process.

POSSESSORY RIGHTS

The possessory side of assets is determined by the rights and remedies available to the possessor. The possessor does not need to be the same as the owner.

Rights of possession determine **who, when, where, how and to what degree commodities and assets can undergo physical usage.** The possessor cannot sell or hypothecate the property. These non-physical operations are reserved for the owner.

Only rights arising from ownership – the property side of assets - allow the operations that form the basis of an economy.

Where property rights are created, traditional, non-economically determined rules for the usage of goods and resources are transformed into *de jure* possessory rights over commodities and assets. In contrast to rules governing usage, possessory rights are property rights and are governed by property law.

Core question of economics: What is a creditor's loss that his debtor must compensate with **interest?**

Property economics argues that the rate of interest cannot be explained by a temporary loss of profit (classical economics), a temporary loss of consumption (neoclassical economics) or a temporary loss of money (Keynesian economics).

The **rate of interest** results from the temporary loss suffered when a burden is imposed on property in the money creation process, for example, by hypothecating property as a security for a loan or by reserving property as capital to back a money note issue. This loss is not a temporary loss of tangible possession but a loss of the intangible potential to burden the property again. This potential to burden carries an immaterial yield – the property premium. Thus, interest compensates the temporary loss of property premium.

An example to visualise the money creation process is that of a private note-issuing bank. Here, promissory notes payable to bearer on demand are issued when credit is provided to a debtor. This creates a **loan asset** and a **matching note liability** in the bank's books. The notes are backed by bank capital and the debtor's loan security (collateral).

Money, interest, credit, and the market

The "true" story

Money	• Is a "notified" claim to the property side of its issuer's assets • It can only be created in a loan contract in which the debtor must have property to be pledged as collateral
Interest	• Compensates the money issuer's loss of unrestricted access to his property when money is secured by it • It offsets the immaterial yield (property premium) • that accrues only from unburdened assets
Credit	• Is generated from the non-physical, i.e., property side of assets • While creditor's asset's property side is encumbered he continues with the physical use of its possession side without any restrictions • In an loan there is no surrender of consumption items
Market	• Is the arbiter of purchase agreements, not a place for bartering goods • Purchase agreements are forced into existence through credit agreements that can only be concluded between creditors as proprietors and debtor as proprietors.

Nobel Prize Theory of the Firm

Neoclassical theory regards entrepreneurs as owners of scarce endowments of goods who want to improve the composition of the latter to be able to increase their output to meet demand. By turning one of the goods into a standard good, i.e. money, they exchange goods, i.e. constitute the market-- up to the equilibrium moment when every all goods are assembled into something useful.

There is no place in neoclassical economic theory for entrepreneurs as property-risking, collateral-pledging and debt-driven owners. When speaking of “property rights”, the thing referred to is material possession but not immaterial securities.

Can **SCARCITY** Provide the Defining Characteristic of the Economy?

- > Tribes live under extreme scarcity!
- > Feudal estates live under significant scarcity!
- > Communist countries live under scarcity!

Yet, these systems do not develop business operations.
All they achieve is production and distribution. They only
know possession but no property. Therefore, in case of
emergency they may die of hunger.

Can **DEMAND** Provide the Defining Characteristic of the Economy?

- > Tribesmen have demand, need huts, canoes, paddles, sleeping mats and cooking utensils!
- > Feudal lords as well as their serfs are good for the same kind of demand!
- > Communist citizens had demand!

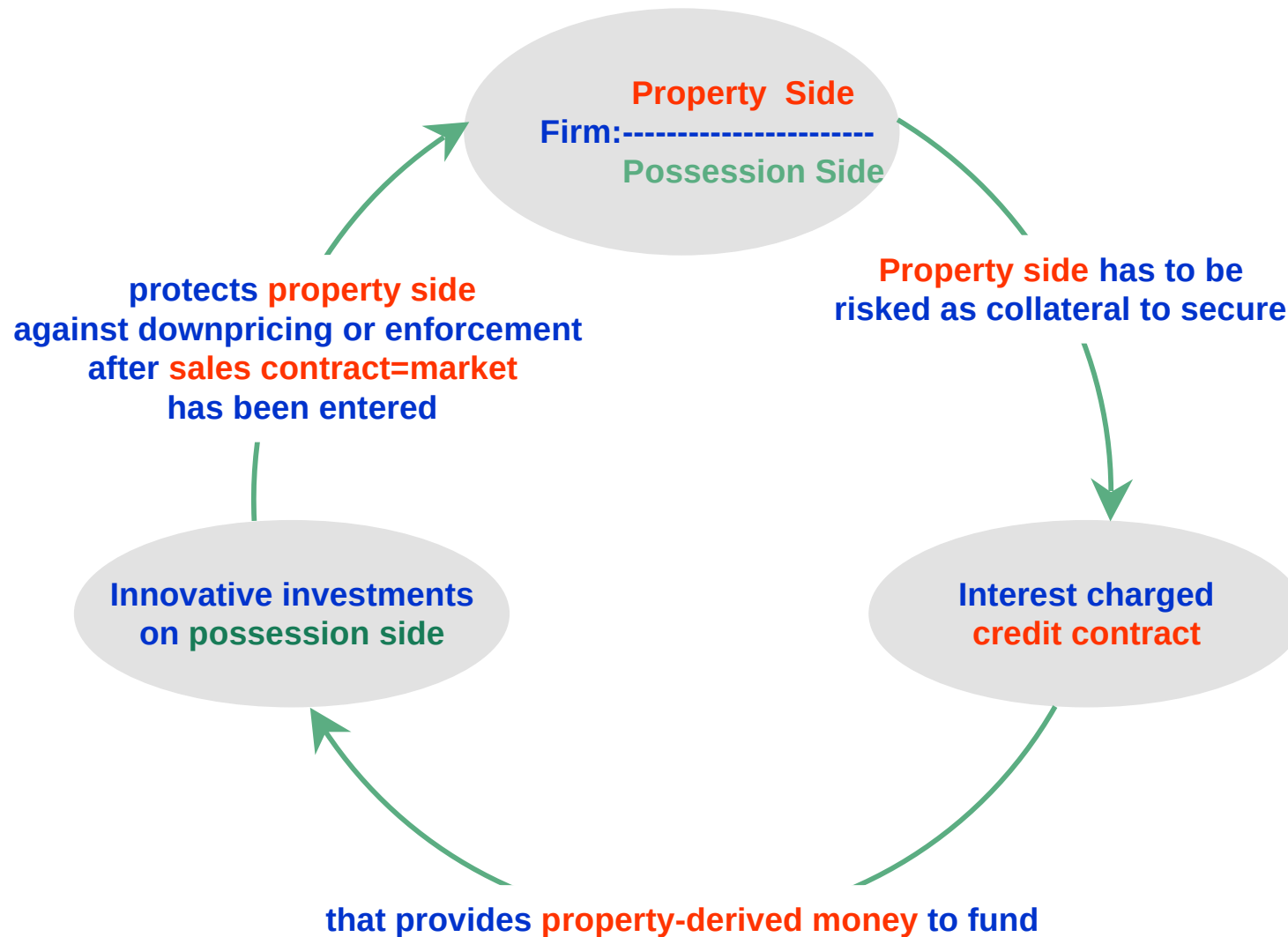
Yet, all that demand does not bring about business operations but only production and distribution systems.

Property Theory of the Firm

A firm is an asset in the economic system that must defend its property side against price decline and foreclosure. It does so by means of innovations on the physical possession side of the asset, where goods are modified and manufacturing processes are revolutionized. To implement these innovations, the firm must invest money in equipment and wages. To borrow this money, it must conclude credit contracts with commercial banks, in which it is **forced to pledge as collateral the very property it has to defend**. Moreover, it has to pay back more than it has received to cover interest.

Thus, total debt of a firm is always higher than the amount of money borrowed. Only if the enterprise is able to generate this «surplus» with **crisis-inducing innovation**, cutting edge technology, and efficient marketing and sell it, in other words if it is able to create a market, will its collateral be redeemed and can be burdened again for incurring new debt. If this does not happen, the collateral will be realized, and the enterprise will disappear.

Property theory of the firm and the role of technological progress: Credit contracts between proprietors father sales contracts, i.e. **money is the father of the market**



Property Theory of the Worker

Labour gives access to money without collateral and interest.

>A worker, other than a slave, has a property side and a possession side. His property, however, is not saleable. It is his freedom--a non-physical title--that merely allows him to temporarily rent out his possessory or physical side, i.e. his brain and body.

>**To turn labour into an access to money someone else must put up collateral and pledge interest, i.e. risk his property, to obtain the liquidity to be forwarded as wage money.**

>Other than a firm's buildings and equipment (real estate and scrap) wage money forwarded is always lost. Therefore, the best wages go to workers who manage labour in a way that makes it add the value owed as interest, and/or to make labour obsolete through technical progress.

>Therefore, a worker always has to modernize his possession side, i.e. to better his skills, to remain capable of earning his potential employers' debt.

The Economic System

Property sides make the difference between mere production communities and an economy



Central Bank

Commercial bank

Company (Firm)

Worker

Property side

• Non-physical title • Property premium to be activated for burdening, selling and enforcement • Burdened for creation of money • Lost property premium offset by claim to interest	• Non-physical title • Property premium to be activated for burdening, selling and enforcement • Encumbered for money and burdened for more interest in on lending money to non-banks	• Non-physical title • Property premium to be activated for burdening, selling and enforcement • Encumbered for investment money and interest to secure property by competitive edge on market	• = Freedom is non-physical too but cannot be burdened, sold or enforced • Right to rent out labor to gain interest-free wage money received to cover interest burdened debt of firm.

Possession side

• Physical • Used simultaneously with activation of property-side	• Physical • Used simultaneously with activation of property-side	• Physical • Used for innovative production to cover the debt of money and interest	• Physical • Qualification, i.e. modernising brain, to help defend company's property

Two **possession-only** production systems

Mankind not only knows one, but **three distinctive systems of material reproduction**, which to this day impose radically different rule sets on the way production and allocation is organised. The term reproduction includes production, distribution, consumption and at times the accumulation of goods. The three idealised types are:

- (1) **A tribal community** that regulates production, distribution and consumption based on mutually binding *customary* rules (following the principles of reciprocity) on for its non-free members collectively. In this community, transactions related to reproduction are altruistic. Independent institutions of law or codified law which could make rules of reciprocity and associated behaviour formally enforceable do not exist.
- (2) **A command system or feudal / socialist seignior**y that regulates production, distribution, consumption and - occasional – accumulation through coercive orders, which in their codified form are often explicitly identifiable as arbitrary in nature. A ruling class extracts levies from unfree individuals, serfs or serf-like workers and justifies this position religiously, ideologically and by providing provisions in emergencies (even though these provision were previously collected through levies). The **state socialism** with its central plans provides a modern version of a command system. Similar to a system based on reciprocity, there are no independent laws that could be enforced against the rulers.

(3) The Property System

Only the property based system constitutes a genuine **society**. Its free individuals are **not tied together by kinship or force but by citizenship**.

The society replaces rules based on reciprocity, custom or coercive orders by **enforceable contracts**. This revolution is identified in the western cultural tradition with figures like Theseus of Athens and his “state without a king” or Romulus, who, when dividing feudal estates into the legendary *Roma Quadrata*, allocated equally sized pieces of land per ballot to his fellow revolutionaries.

The property based society regulates production, distribution, consumption and accumulation through property, which can be burdened and hypothecated, interest and money; all three of which are not available in the other two systems.

Money is not created out of the pasture but derived from the fence around it

If a bank's capital asset is pasture, its non-physical property title – not its possession soil-side – is burdened to secure its money notes. Simultaneously, the bank continues with rearing and milking its cows because the physical (possession) side of its enterprise is not part of the credit contract. Thus, the bank does not forego any consumption because it never loans (and moves away) a physical good from the farmland's possession side. Its cows continue eating the grass and giving their milk to the bank of issue.

Therefore, the case for the neoclassical theory of interest simply does not occur. Interest is demanded for losing *property premium* given up by the bank when it burdens its property to back its money. **Money, thus, is a claim to the bank's non-physical property (capital and loan assets), not to a bank's possessions (or to its physical “goods”).**

To use a simple image, **money is derived from the fence** (allegory for property) around the field, not from the field's soil. Genuine economies – as distinct from production systems like bee hives, tribes, feudal or socialist structures – are run by “activating the fences.”

Crisis as a result of human nature or of arrogance? Neither! Defense of property is the cause of business cycles



"People often ask me why, throughout history, entire economies end up in such devastating crises. Unfortunately, the answer to this question is very simple: arrogance and ignorance."

Kenneth Rogoff

"Bubbles are built into human nature."

Alan Greenspan



Entrepreneurs must either help to bring about over-capacity tomorrow or lose property right away

Source: *Financial Times Deutschland*, Nov. 11 2009, p. 24 and *cnn.money.com*, February 5th 2010

Boom-inflations and bust-deflations in individual industries

Booms and busts in individual industries occur with innovation



Companies specializing in innovative technology as well as their buyers experience an **inflation** of their share prices, because expectations of high returns appear well justified



Due to unavoidable overcapacities some companies eventually must fail



This failure is brought about by **deflation** of previous inflated prices, which leaves many loans insufficiently collateralized and eliminates competitors



Affected banks have to write down their assets – some will fail

If banks do not lend in a boom they will see their share prices fall right away

Property theory of the garden variety crisis

All proprietors must permanently move away from over-indebtedness, i.e., must protect their property against downpricing or enforcement.

Therefore, an innovation always forces an entire industry into debt for investment, even though technical progress by all branch members—plus new competitors coming from outside—may result in capacities short of demand. Thus, it is not the volume of demand to which a company has to tailor its innovations. They have to defend its capacity to survive within a peculiar field of demand whatever its prospective volume.

Companies, thus, face the choice between avoiding debt for investment and seeing their property down-priced today or going into debt by riskfully collateralizing their property with the mere chance of belonging to those that will not see it property wiped out tomorrow when overcapacity is eliminated by decreasing prices.

**Irving Fisher (1933) described the course of a financial crisis
...however without comprehending the unavoidability of overindebtedness forced
on the companies to defend their property by or against innovative investment**

Debt Deflation Theory



Two major factors lead to a major depression: start with over-indebtedness and follow soon after with deflation

Chain of consequences



Source: "The debt-deflation theory of great depressions", in *Econometrica*, 1933

Different views on Innovation: A phenomenon that is well-described – but rarely understood

Innovation is fun!
Daniel Düsentrrieb



Innovation is creative destruction!
Joseph Schumpeter



Innovations are sudden
displacements!
Charles Kindleberger



**Innovation is driven by a company's need
to protect its property against downpricing**

Examples of deep recessions due to innovations that all industries must implement to defend their property

- Boom **1789** (recession **1815**) is tied to investment in canals for transportation and large factory halls for production.
- Boom **1849** (recession **1873**) out of investment in new steel metallurgy for building tracks, in steam engines for trains and ships, as well in coal mines to fire the engines.
- Boom **1896** (recession **1920**) sees money flowing into combustion engines, oil drilling, cars, electricity grids and power generation.
- Boom **1922** (aggravated by cash flow into US plus German reparations; recession **1929**) invests in radios, telephones and assembly line car production. *Radio Corporation of America's* (RCA's) stock price jumps, in 1928 alone, from 85\$ to 420\$ though the company had yet to pay a dividend. Main mistake: Raising interest for entrepreneurs to stop speculators.
- Boom **1951** (recession **1966**) brings transistors, synthetics (Nylon) and mass television.
- Boom **1989** (aggravated by 1996ff. monetary dumping of BoJ; recession **2000** [burst of dot.com bubble]) brings computer, mobiles and the connection of the world to the internet.

Recession of 2008 followed the burst of the zero-interest bubble that had little to do with an innovation driven over-capacity bubble

What happens when a central bank tries to “flood” the post-crash economy with cheap money?



"Normal times"

Companies are compelled to make investments in order to stay in competition.

They have to keep up with their competitors who want to drive them out of the market by way of innovation.

Companies as typical debtors of commercial banks who have to find property endowed enterprises as their debtors.

They receive credit if they can secure it by providing property assets as collateral and by accepting to pay interest, as long as its bank can—in return for interest and collateral—borrow central bank money to increase its reserves.

Companies do not borrow, and risk collateral, a second time for the mere reason that the interest rate suddenly dropped.



"zero-discount rate times"

Cheap central bank money leads to an oversupply for investment.

Therefore, banks track down alternative investment opportunities, e.g. **price increases**.

They invest in every title that yields a higher return than the interest charged by the central bank.

This extra demand drives up asset prices lowering their yields so close to central bank rates that the bubble bursts. The ensuing price decline decreases value of collateral crippling companies whose collateral is not sufficient to repay old or incur new debt.

Near-zero interest rates intended to help companies actually help to destroy them

Key principles of central banking

Bagehot and Hawtrey formulated ...



"... loans (to solvent but illiquid banks) should only be made at a **very high rate of interest**. This will operate as a heavy fine on unreasonable timidity, and **will prevent the greatest number of applications by bankers who do not require it.**"

"Secondly. That [...] advances should be made on all good banking securities". This should include 'every kind of security [...] on which money is ordinary and usually lent.'"



"The essential duty of the central bank as a lender of last resort ... cannot mean that it should lend to any bank. ... A commercial concern or a public institution cannot afford to take risks out of proportion to its own capital."

... the two key principles of central banking

A central bank must demand interest to not derail the banking sector

1

- A central bank is the commercial bank for the commercial banks
- By waiving interest it deprives its proprietors of the profit due to them
- When acting as the lender or purchaser of last resort it has to demand an increased rate of interest from an illiquid but solvent commercial bank

2

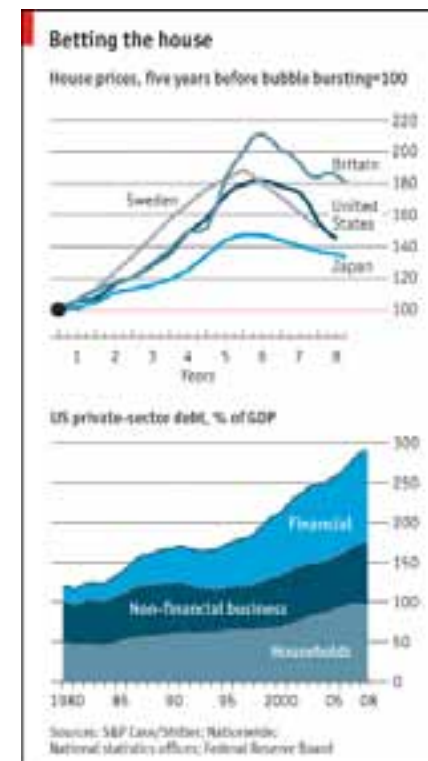
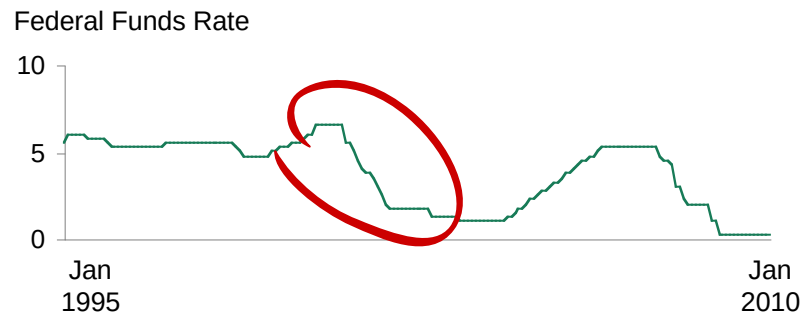
- **The central bank is a business too with property (own capital) to be protected**
- Advances should be made on all good banking securities
- No cash to insolvent borrowers or risk taking out of proportion to capital

Both principles were violated by the BoJ as well as the Fed before and during the subprime crisis

**Money cannot be flooded because its receivers must pledge collateral.
Yet, banks must “dance” to the flood, i.e. inflate asset prices**

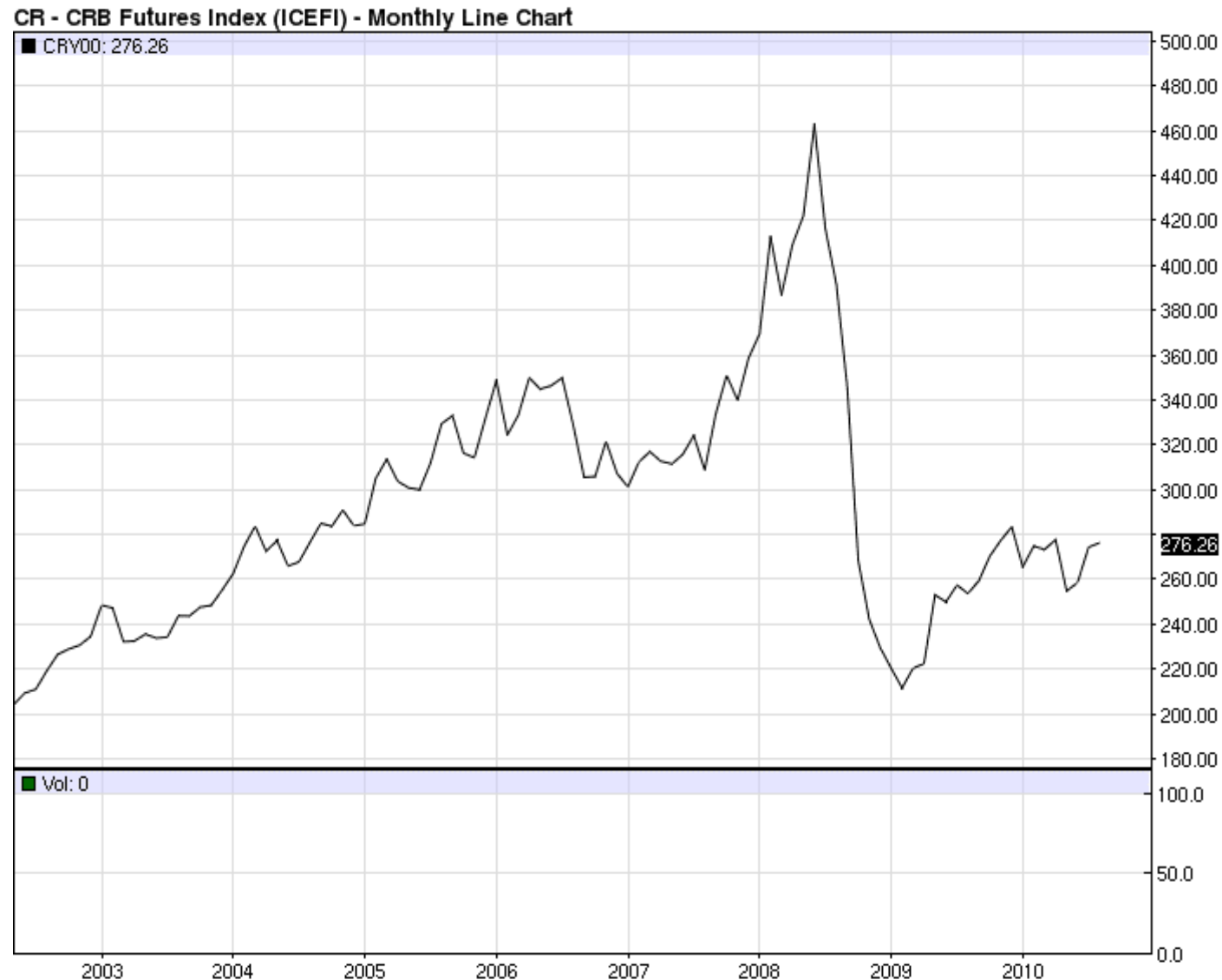
**After burst of dot-com bubble Fed
tried to "flood real economy with
money" ...**

... but the money hardly got there



- **2007: 40% of profits** earned by listed US companies go to banks' with **5% of workers**
- **50% of debt owed** by listed US companies is **owed by banks [10% in 1980]**
- **116% of US GNP** reaches the level of debt of US banks **[21% in 1980]**

Investment in price inflation of commodity futures



Observed yet not understood: Inflation of Commodity prices World 2003 to 2007

“Though there was no one shock confined to oil or any other commodity nearly all commodity prices massively increased. “

Noureddine KRICHENE, International Monetary Fund (May 2008)

During the same period consumer prices remained subdued. Consumers buying eggs and refrigerators had no access to central banks with zero-interest money.

Moreover, commodity consuming companies—that too have no access to central bank zero-interest money—were hit hard by the central bank’s policies. Designed to help them it merely drove up the prices the had to pay.

Near-Zero Interest Drama's Second Act

after Japan's first act (page 3)

In November 2002—Japan had just informed the world of the futility of its zero-interest policy—the Fed lowered cut its interest to 0,75 %

**“to achieve satisfactory economic performance”.
(Alan Greenspan).**

Where does, this time, the money go that does not reach companies and workers?

Asset price inflation

Between 2001 and 2008, the global money supply exploded
from 36 to more than 70 trillion dollars (IMF).

Commercial banks, or the investment banks and hedge funds they employ, use the unexpected plum credits to buy anything that yields more profit than the low interest rate. If the interest rate is one percent, they will go for any investment class that yields more than two percent, such as raw materials, mines, factories, works of art, coffee, bonds, existing real estate, or other banks. Due to this demand, all these industries experience a sudden price increase.

But what are these appreciations really? If breakfast eggs would be an asset class, a farmer would thank the Lord for the doubling of the price of his hens. But his wife would understand that only their price has been inflated. After all, she isn't collecting a single egg more than before from the coop.

Traders with access to central banks' near-zero interest money: Example Goldman Sachs

1998: 28% of Goldman Sachs profits from trading

2009: 76% of Goldman Sachs profits from trading.

Stephen Gandel (*Time*, 3 May 2010)

2000: Daily value at risk money: US \$ 28 million

2005: Daily value at risk money: US \$ 70 million

Stephen Gandel (*Time*, 3 May 2010)

Since June 1996: 0,5 % fund rate Bank of Japan

Since June 2002: 0,1 % fund rate Bank of Japan

2002-2004: 0,75 % fund rate of Federal Reserve

Commercial banks “dancing“

USA 2003 to 2007

\$4 loaned by central bank added \$1 to GDP.

Euroland 2003 to 2007

€4,70 loaned by central banks added €1 to GDP.

\$3 out of \$4 as well as €3.70 out of €4.70

merely inflated asset prices.

**75 % of newly created debt never came into contact with the productive complex,
the possession-side of companies and workers that alone makes it serviceable.**

Instead of stalling the recession the Fed promotes a credit crunch and helps intensifying the sub prime mortgage market

**Promoting a credit crunch
with zero-interest policy**

**Zero-interest is no automatic incentive
for innovative investment**

**A zero-interest policy tailored to help
companies ended with opposite side
effects by creating an asset bubble**

**When it bursts prices of company
shares and of assets in their own capital
portfolios fall together with the
crashing markets**

**If in such circumstances an innovation
arrives that they must implement to
defend their property companies cannot
get credit because their potential
collateral was priced down too**

**Bringing credit to 20 million American
households (60 million people)
without sufficient collateral**

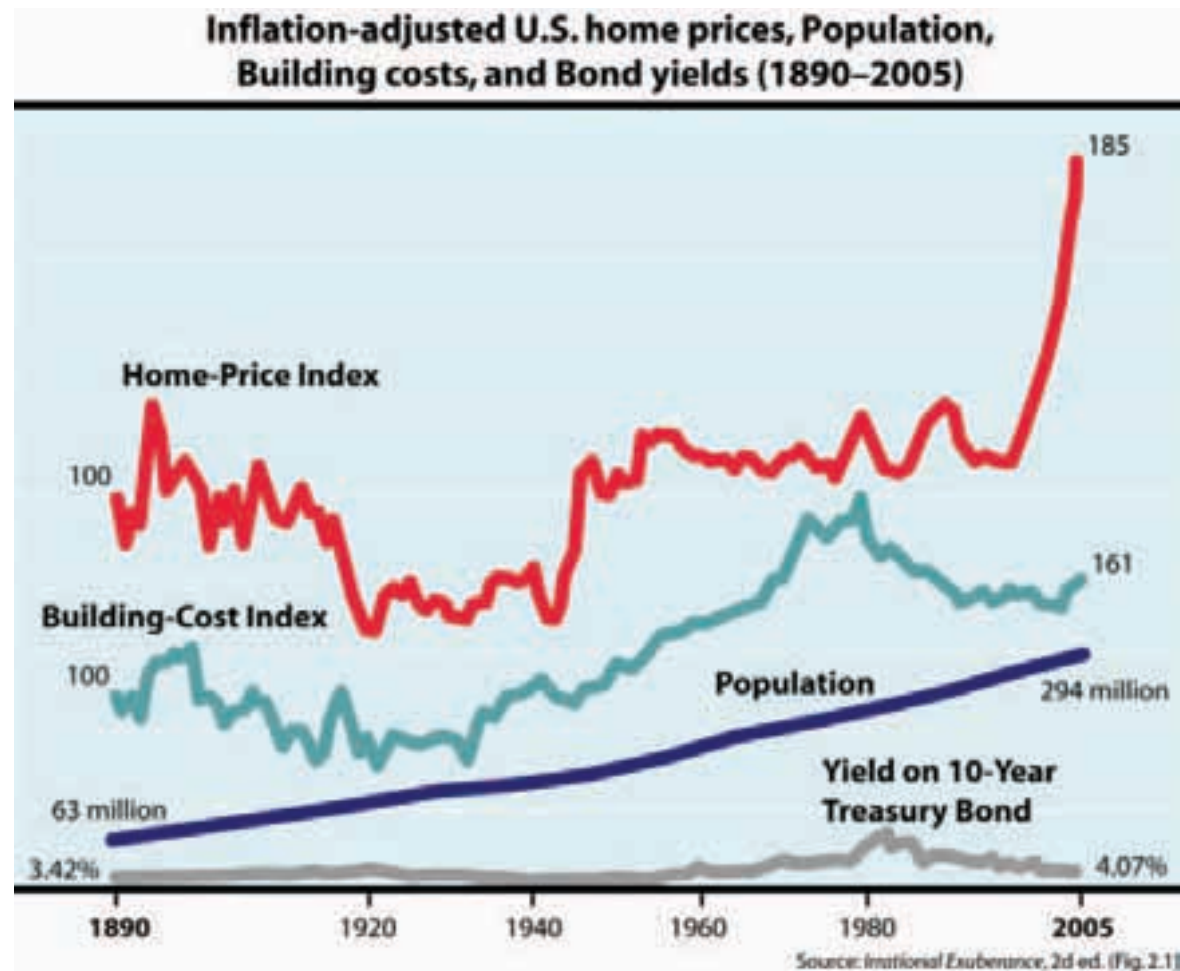
**1980: 50% of all US home owners are
burdened with a mortgage**

**2007: 65% of all US home owners are
burdened with a mortgage**

**25% of these 75 million mortgage
holders—19 million in total—had nil or
negative equity in their homes**

**19 million homes are equivalent to all
domestic real estate of nations with 60
million inhabitants like Italy, France or
the United Kingdom**

U.S. home prices 1890-2005

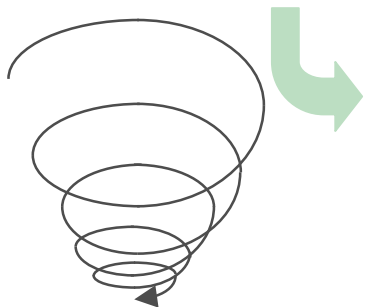


Wiping out the collateral of prime mortgage debtors by not demanding collateral from subprime debtors

By November 2004, the discount rate in the US quadrupled to 3% compared with 0.75% three years earlier. In May 2006, it stood at 6%—eight times higher than 30 months before with actors not grasping consequences

Financial institutions then had to demand from their brand new class of no-collateral-debtors more than they could defray

Non-recourse loans enabled borrowers to simply default and walk away. For their unpaid new buildings buyers can't be found because Americans with collateralizable property have already purchased a house if they wanted one



19 million homes pressing into the US real estate market drive down the home prices of the 45 million sound debtors. Their mortgages are suddenly more expensive than their houses

Whilst the sudden federal funds rate increase pushed the subprimers in the liquidity trap, the music for the commercial banks did not yet come to an end. Between 2004 and the onset of the crash in 2007, they could still turn to the Bank of Japan (discount rate between 0.1 and 0.75%).

Well meant zero-interest policy once again wiped out collateral as the property basis for any economic activity

Typical rage of a Nobel Prize winner

Joseph Stiglitz (Nobel Prize 2001) gets angry and demands strict selection of banks to be bailed out by governments:

«The banks that get money from the government should be the ones that actually onlend it»

Lazurowy Ogród
(*Der Spiegel*, March 30, 2009).

What does he forget?

The collateral firms do not have!

From Japan's *Monetary Dumping* (1995)
via the Fed's (2002) to the global tarantella (2008)

The central banks dancing.

Near-Zero Interest Drama's Third Act (after 2nd, p. 47)

Because of near-zero funds of the Fed, BoJ, Bank of England, Euroland etc. commercial banks have – by the end of 2009 - invested ca. \$1,500bn in price increases.

This inflation of asset prices mostly hits Asian emerging markets like China, India, Indonesia etc.) whose central banks operate with interest rates way above one percent.

Zhu Min, Vizegouverneur der Bank of China:

„The big risk this year is the dollar carry trade. / It is a massive issue. Estimates are that the dollar carry trade is \$1,500bn” (*Financial Times*, 29. Januar 2010, S. 24).

Renewed asset price inflation

Of US-**\$100 net asset growth** in the US in the 2nd quarter of 2009 (the first growth since October 2007) US-\$98 are due to the re-inflation of asset prices (shares, commodities, real estate) brought about by extremely low interest rates (*Fuchsbriefe*, 25-09-09).

At the same time, the official number of jobless Americans jumped from 8 million in December 2007 to 15 million in January 2010.

Interest rates of major central banks

Central Bank	Next Meeting	Last Change	Current Interest Rate
Bank of Canada	Sep 08 2010	Jul 20 2010	0.75%
Bank of England	Aug 05 2010	Mar 05 2009	0.5%
European Central Bank	Aug 05 2010	May 07 2009	1%
Federal Reserve	Aug 10 2010	Dec 16 2008	0.25%
Swiss National Bank	Sep 16 2010	Mar 12 2009	0.25%
Bank of Japan	n/a	Dec 19 2008	0.1%

	Current rate	Previous	Last Change
Brazil	9.50%	8.75%	Apr 28 2010
China	5.31%	5.58%	Dec 22 2008
Egypt	8.25%	8.50%	Sep 22 2009
India	5.00%	4.75%	Mar 19 2010
South Africa	6.5%	7.0%	Mar 25 2010
Turkey	6.50%	6.75%	Nov 20 2009

<http://www.whichwaytopay.com/world-interest-rates.asp>

Monetary Dumping by First World Central Banks

„Near zero rich-world rates encourage yield hungry investors to place their short-term funds in emerging markets. That is a headache for central banks in those countries which find that raising rates to cool their economies only encourages speculative inflows.“ (Raghuram Rajan, *The Economist*, **July 17th-23rd 2010**, p. 70.)

Right! But what else?

Carry trade driven property prices (all asset classes) rise faster than the economy, i.e., the ability to service the debts incurred to buy such assets. It is Japan with its cashflow of the 1980-s or the US with its near-zero interest central bank funds of 2002-2004 all over again.

Longest rally of two-year notes in quarter century

Treasury two-year notes rose for a 10th week in the longest rally since 1986 as private employers added fewer jobs in July than forecast, spurring concern that the Federal Reserve may be forced to add stimulus.

The yield dropped below 0.50 % (after nearly 7% in 2001) for the first time in August 2010.

Bill Cross: “When you get down to 50 basis points on two-years, that’s giving you a signal that **there’s not much left on the table.**” <http://www.bloomberg.com/news/2010-08-06/pimco-s-gross-says-fed-isn-t-likely-to-raise-rates-for-two-to-three-years.html>

Why? Because the government cannot sell bonds with a Fed rate above 0.5% when the yield on two-years stands at 0.5%.

From sub prime mortgage takers to **sub prime governments**

In 2010 alone the Euro area needs to sell €2.2 trillion in government debt.

€110 billion rolled out in May 2010 by Euro-Nations to Greece—out of a total debt of €300 billion—appear to be small fry .

- Although the country is on the European dole since 1981 its net national savings rate of minus 5.1% (2008)—against an average of plus 6% in the Euro area—is not sufficient to finance net investment from national savings.
- With a median age over 41 years and a shrinking population reaching a median age of 50 in 2050 the country will never be able to repay.

German and French commercial banks alone hold €120 billion of Greek Government Debt

- This sum is as irredeemable as the €140 billion owed all over the world by Lehman Brothers in 2008.
- **After the 2008 crash much of commercial banks' wiped out own capital was replenished with sovereign debt.**
- Can it be restocked once again with more of that when the €120 billion are eliminated? Or will the banks be gone for good?
- **The €750 billion protection fund of 9 May 2010 does not consist of taxpayer money but of more sovereign debt to replace already non-serviceable sovereign debt.**

Balancing wiped out Euros with wiped out Euros?

A sovereign debt title face valued at 10.000 € (yielding between 3% and 10%) is bought through credit obtained for 0% to 1% at a central bank. The rate difference provide easy returns though none of that money ever comes into contact with companies and workers. The billions earnt through fixed income trades by commercial banks, therefore, ar simply billions of fresh taxpayer debt incurred by governments.

Such sovereign debt serves as own capital and assets of commercial banks as well as collateral pledged to central banks. If the face value of such an asset falls to 5.000 € the balance of 5.000 € has to be cut out of own capital. Yet, there, the same type of debt has also fallen to 5.000 €.

**How does one balance wiped-out €5.000 of assets
with €5.000 wiped-out € of own capital?**

Trio Infernale: Governments, Central Banks, Commercial Banks

- 1. Central banks charge commercial banks between zero and one percent interest. In addition, they buy sovereign debt at face value or accept them as collateral from these banks at face value. Such a procedure protects sovereign bonds against free fall devaluations but incapacitates bond markets to function as markets.**
- 2. Commercial banks use central banks' zero-interest money to buy sovereign debt which they will, however, only do as long as bond yields stay above central bank interest rates. To keep governments liquid government agencies, therefore, permit commercial banks to book government bonds like 100 percent liquid cash. Thus, they do not—and cannot for their own survival—require the banks to increase capital and/or build up reserves to balance falls in the price of government bonds.**
- 3. The difference between central bank interest rates (0 to 0.25%) and government bond yields (0.5 to 7) provide the main source for billions in profits „earnt“ since 2008 by commercial banks.**
- 4. These fresh profits equal additional billions of tax payer debt because the governments service their bonds not with taxes but with additional debt. The impressive new earnings of commercial banks arise without them ever coming into contact with companies and workers. In the US they arise at the same time as the jobless rate rises from 4 to 16 percent.**

Zero-interest destroys saving

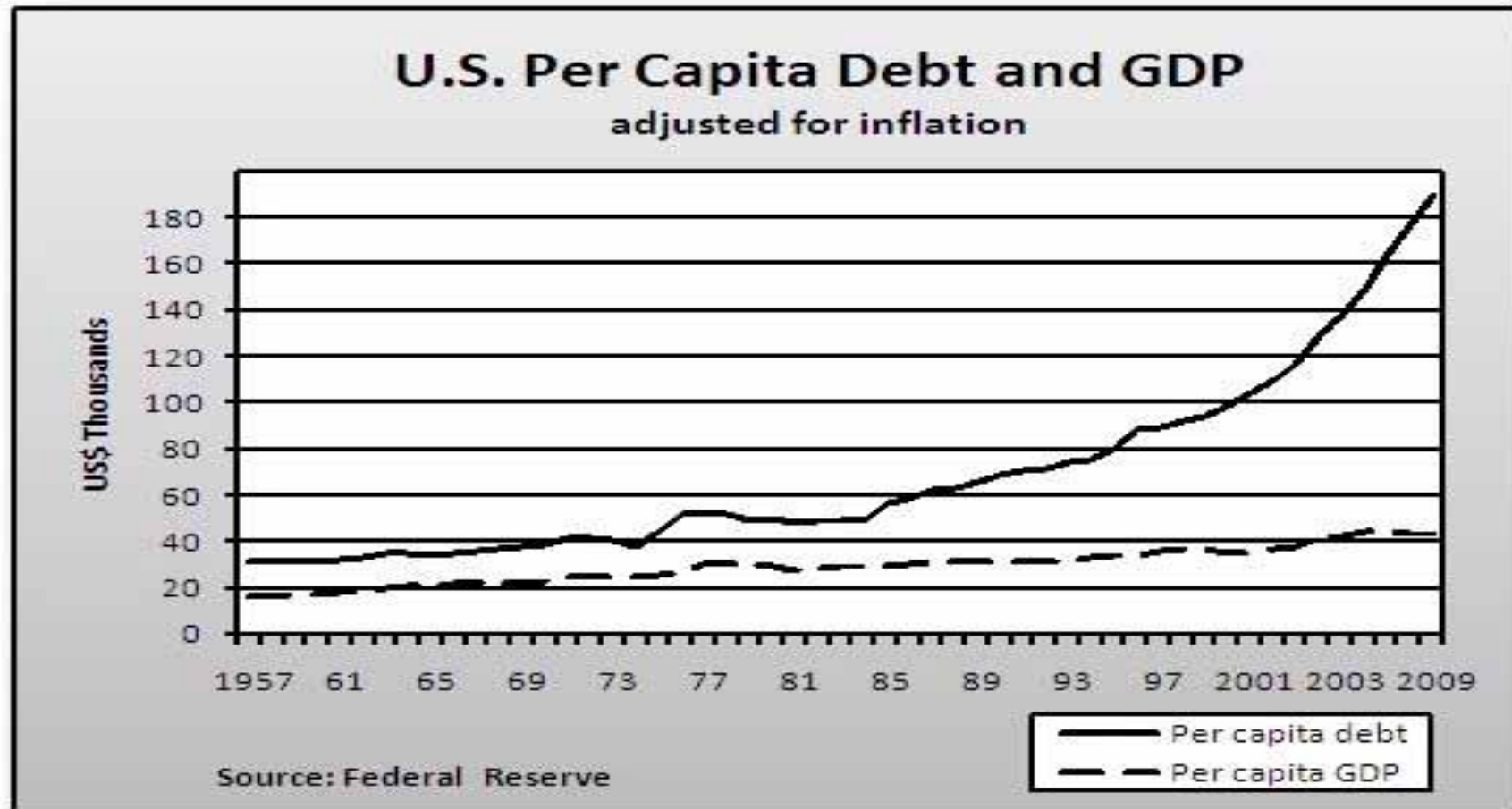
Yields of bank deposits follow central banks' interest rates. A commercial bank that pays 1 % to the central bank will usually not pay more to non-bank savers.

What helps “stabilise the banking system” (BoJ chief Shirakawa) deprives depositors.

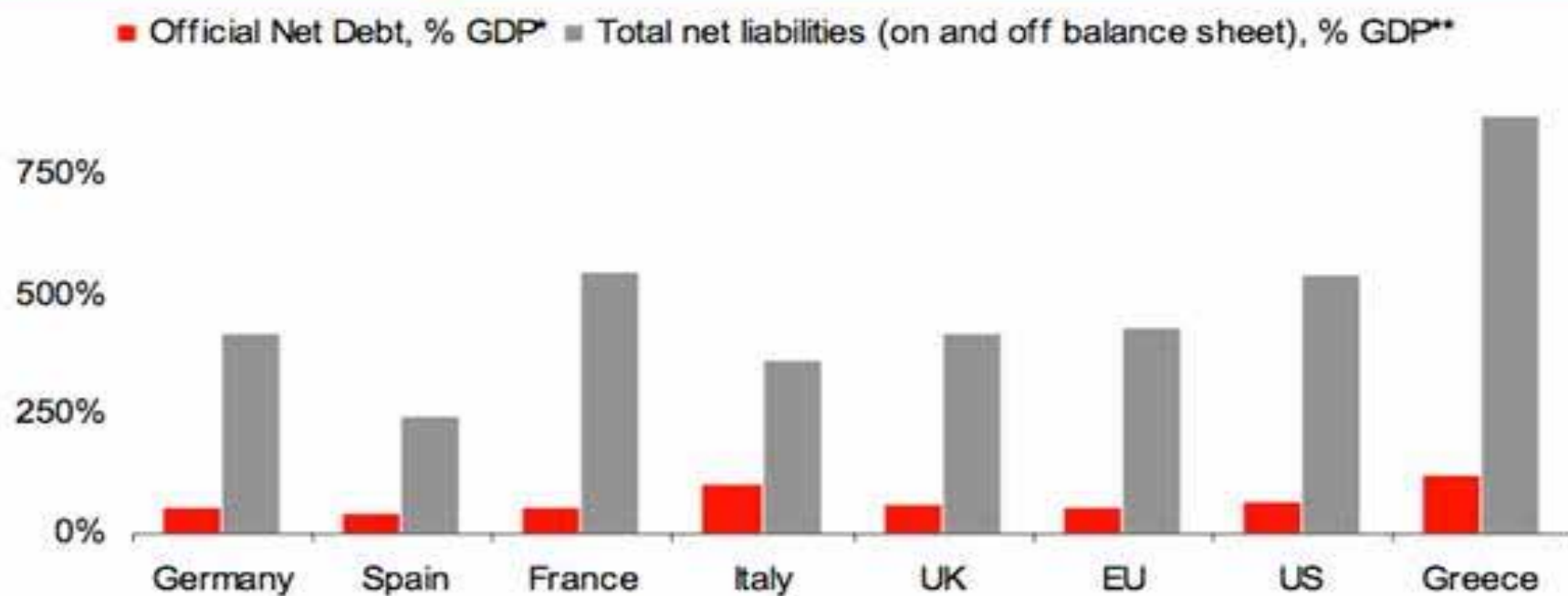
Sovereign bond yields falling in the wake of bailing out the financial system with such bonds no longer cover the yield life insurers have guaranteed their customers. They fail—as did seven major Japanese insurer in the 1990s and 2000s—when these losses are no longer balanced by price increases of bonds bought earlier.

Again, common citizens are deprived of savings.

US debt as *pars pro toto* model for OECD Nations



Official and hidden sovereign debt



* 2010 OECD projections

** 2005 estimates of total Fiscal Imbalance

Source: SG Cross Asset Research; Jagadeesh Gokhale (2009); OECD

War for Foreign Talent?

Annual demand for skilled
immigrants up to 2050

Newborn 2007

TF= Total Fertility (World 2007: 2.6)

MA=Median Age (World 2007: 28 y.)

Australia (TF: 1.76; MA: 37.1)	100,000		Austria (TF: 1.37; MA: 41.3)	71,000
UK (TF: 1.66; MA: 39.6)	200,000		Switz. (TF: 1.44; MA: 40.4)	73,000
Ireland (TF: 1.86; MA: 34.3)	30,000		Germany (TF:1.40;MA:43)	680,000
Canada (TF: 1.61; MA: 39.1)	130,000		Poland (TF: 1.26; MA: 37.3)	383,000
N. Zeal. (TF: 1.79; MA: 34.2)	20,000		Ukraine (TF: 1.24; MA: 39.2)	483,000
USA (TF: 2.09; MA: 36.6)	1,200,000			

1,680,000 |

1,680,000

Demographically, the **Anglo-World has to suck dry a handful of major European nations merely to slow the ageing of its own populations.** Yet, these European providers of manpower are desperately fighting for skilled immigration too – close to one million annually for the five examples given here. But up to 2050, the total demand for foreign talent will be 150 million for the entire developed world.

Demography: China (C) – Germany (D)

The Return of Political Economy or Mutual Cannibalization for Foreign Talent

C 738 : D 473

C 640 : D 449

C 750 : D 745

C 650 : D 707

**Boys
0-4 years**

**Girls
0-4**

**Boys
0-4**

**Girls
0-4**

1.000 Men

1.000 Men

1.000 Boys

1.000 Boys

40-44 years

40-44

15-19

15-19

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In a recent encyclopaedia covering the most inspiring 650 works in economics of altogether 460 authors worldwide from antiquity to the 20th century, the author (*1943) is the only living scholar of the German language area represented with four different studies (followed by Reinhard Selten [*1930; Nobel Price 1994] with three texts). See D. Herz and V. Weinberger, eds., *Lexikon ökonomischer Werke: 650 wegweisende Schriften von der Antike bis ins 20. Jahrhundert*, Düsseldorf: Wirtschaft und Finanzen, 2006, pp. 186–190.

The money explanation of *Eigentum, Zins und Geld* [Property, Interest, and Money , Reinbek: Rowohlt, 1996; 4th ed. 2006; with Otto Steiger (1938-2008)] is, since 2000, represented by the *Geldmuseum der Deutschen Bundesbank* (Money Museum of the German Bundesbank, Frankfurt am Main) in juxtaposition with the money views of Aristotle, Adam Smith, Bernard Laum, and John Maynard Keynes.

Prof. Daniel Innerarity



DIE NICHTWISSENSGESELLSCHAFT

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Die Wissensgesellschaft hat eine radikale Änderung des Konzepts des Wissens verursacht, bis zu dem Punkt, dass man sie eigentlich „Nichtwissensgesellschaft“ nennen müsste, d.h. eine Gesellschaft, die sich in zunehmender Weise ihres Nichtwissens bewusst ist und deren Fortschritt, mehr als durch das Anhäufung von Wissen, durch die Handhabung der verschiedenen Gestalten des Nichtwissens geprägt ist: Unsicherheit, Wahrscheinlichkeit, Risiko und Ungewissheit.

Es gibt Ungewissheit, was die Risiken und Konsequenzen unserer Entscheidungen betrifft, aber auch eine Ungewissheit betreffend der Normen und der Rechtmäßigkeit. Es tauchen neue und verschiedene Arten der Ungewissheit auf, die nicht nur mit dem noch Unbekannten zu tun haben, sondern auch mit dem was man nicht wissen kann. Es stimmt nicht, dass wir in der Lage sind, für jedes auftauchende Problem das notwendige Wissen zu generieren. Sehr oft basiert das verfügbare Wissen in nur minimalem Teil auf sicheren Fakten und der Rest auf Hypothesen, Ahnungen oder Indizien.

Diese Rückkehr in die Unsicherheit bedeutet nicht, dass gegenwärtige Gesellschaften weniger von der Wissenschaft abhängig sind, sondern ganz im Gegenteil. Die Abhängigkeit ist sogar größer; was sich geändert hat, ist die Wissenschaft und das Wissen im allgemeinen. Seit geraumer Zeit wenden wir unsere Aufmerksamkeit auf eine Serie von Aspekten an, die man als „Schwäche der Wissenschaft“ bezeichnen könnte: Unsicherheit, Kontextualität, Flexibilität der Interpretation, Nicht-Wissen. Gleichzeitig haben sich die Probleme geändert, und dadurch, die Art des benötigten Wissens. In vielen Bereichen – wie, zum Beispiel, bei der Marktregulierung oder

den ökologischen Problemen – muss man auf Theorien zurückgreifen, die Wahrscheinlichkeitsmodellierungen darstellen, aber keine exakte Voraussage auf längere Sicht.

Bei den schwerwiegendsten Fragen, die die Natur oder die Zukunft der Menschheit betreffen, werden wir mit Risiken konfrontiert, für die die Wissenschaft keine sichere Lösung bieten kann. Was die Wissenschaft tut, ist Ignoranz in Unsicherheit und Ungewissheit zu verwandeln (Heidenreich 2003, 44). Die Wissenschaft ist nicht in der Lage, die Politik von der Verantwortung zu befreien, unter Unsicherheitsbedingungen entscheiden zu müssen. Obwohl die Wissenschaften enorm dazu beigetragen haben, die Menge an sicherem Wissen (*“reliable knowledge”*) zu vergrößern, ist es bei hochkomplexen Systemen wie Klima, menschliches Verhalten, Wirtschaft oder Umwelt, zunehmend schwieriger kausale Erklärungen oder exakte Voraussagen zu erhalten, da das kumulierte Wissen das unendliche Universum des Nicht-Wissens sichtbar macht.

Wahrscheinlich dieser Prozess der Pluralisierung und Zerbrechlichkeit des Wissens ist der Grund für die Erosion der Autorität der Staaten und der politischen Krise, und wir werden die konfigurierende Kapazität der Politik nicht wiedergewinnen können, wenn wir es nicht schaffen, die Macht mit den neuen Formen des Wissens zu artikulieren. Eine Risikogesellschaft verlangt nach einer neuen Risikokultur.

Lange Zeit hat die moderne Gesellschaft darauf gebaut, dass politische und wirtschaftliche Entscheidungen auf der Basis eines rationellen und sozial gerechtfertigten (wissenschaftlichen) Wissens getroffen werden. Die andauernden Konflikte über Risiko, Ungewissheit und Nicht-Wissen, sowie der kontinuierliche Dissens der Experten, haben in steigendem und unwiderruflichem Masse dieses Vertrauen zerstört. An Stelle des Vertrauens herrscht die Gewissheit, dass die Wissenschaft sehr oft nicht zuverlässig und konsistent genug ist, um objektive, unbestreitbare und sozial gerechtfertigte Entscheidungen treffen zu können.

Denken wir an die Risiken für die Gesundheit oder der Umwelt, die üblicherweise nur mit einer geringen Gewissheit bestimmt werden können. Entscheidungen dieser Art müssen dann weniger durch Wissen als durch eine rationelle und gerechtfertigte Verwaltung der Ignoranz getroffen werden.

Unser bisheriges Wissensmodell war naiv kumulativ; man erwartete, dass das neue Wissen dem alten addiert wird, ohne es zu problematisieren, und das damit der unbekannte Raum sich verringern und die Berechenbarkeit der Welt sich vergrößern würde. Aber das ist nicht mehr so.

Die Gesellschaft basiert nicht mehr auf einem dynamischen Prinzip der ständigen Wissensanhäufung und des Rückgangs des Nichtwissens. Es gibt ein Nichtwissen, das durch die Wissenschaft selbst verursacht wird, eine *“science-based ignorance”* (Ravetz 1990, 26). Dementsprechend ist dieses Nichtwissen nicht ein Problem der vorläufigen nicht-Verfügbarkeit von Information, sondern, gerade aufgrund des Fortschrittes der Wissenschaft, steigert sich in überproportionalem Masse das Nichtwissen (über die Konsequenzen, Reichweite, Grenzen und Zuverlässigkeit des Wissen) (Luhmann 1997, 1106). Wenn auch in anderen Zeiten die vorherrschenden Methoden, die Ignoranz zu bekämpfen, darin bestanden, sie zu eliminieren, so gestehen die aktuellen Vorstellungen ein, dass es eine unbegrenzte Dimension der Ignoranz gibt, die uns dazu zwingt, sie zu verstehen, sie zu tolerieren und sogar sie als Mittel oder Werkzeug zu sehen (Smithson 1989; Wehling 2006).

Ein Beispiel dafür ist, dass in einer Wissensgesellschaft das Risiko auf “das Wissen anderer” zu vertrauen, ein Hauptfaktor geworden ist. (Krohn 2003, 99). Die Wissensgesellschaft kann man gerade als solche definieren, in der man das Nichtwissen verwalten muss. Die Grenzen zwischen Wissen und Nichtwissen sind weder unanfechtbar noch selbsterklärend, noch offensichtlich, noch stabil. In vielen Fällen ist die Frage offen, wie viel man noch wissen kann, was man nicht mehr wissen kann oder was man nie wissen wird.

Es geht nicht um den üblichen Kant-Bescheidenheitsdiskurs, der die Grenzen der menschlichen

Wissenschaft eingesteht und wie wenig wir wissen. Es ist sogar etwas viel ungenaueres als die "spezifizierte Ignoranz", über die Merton sprach; ich spreche von schwachen Formen des Nichtwissens, wie das angenommene oder befürchtete Nichtwissen. In vielen Fällen wissen wir nicht, was passieren kann, aber sogar "*the area of possible outcomes*" (Faber / Proops, 1993, 114).

Das Ansprechen auf die "*unknown unknowns*", die jenseits der Risikohypothesen zu finden sind, hat sich zu einem mächtigem und zwiespältigem Argument bei sozialen Kontroversen im Zusammenhang mit neuen Forschungen und Technologien entwickelt.

Selbstverständlich ist es immer noch wichtig, den Erwartungshorizont zu erweitern, um das Nichtwissen, das uns unbekannt ist, zu erfassen, und das "unbekannte Nichtwissen" zu entdecken. Aber dieser Anspruch sollte uns nicht in den Irrglauben führen, dass das Problem des unbekannten Nichtwissens auf traditionelle Art gelöst werden kann, eben durch das Auflösen in mehr und besserem Wissen. Auch dort, wo die Relevanz des Nichtwissens erkannt worden ist, ist das, was man nicht weiß, unbekannt, und es ist unbekannt, *ob* es etwas Entscheidendes ist. Die Wissensgesellschaften müssen sich mit der Idee vertraut machen, dass sie sich immer wieder der Frage des unbekannten Nichtwissens stellen werden müssen; dass sie nie in der Lage sein werden zu erfassen, ob und in welchem Masse die "*unknown unknowns*", denen sie sich stellen werden müssen, relevant sind.

Wie Ulrich Beck warnt: was diese „Zeit der Nebenfolgen“ bezeichnet, ist nicht das Wissen, sondern das Nichtwissen (1996, 298). Das ist das eigentliche soziale Schlachtfeld: wer weiß und wer nicht, wie wird Wissen oder Nichtwissen erkannt oder angefochten. Wenn wir gezielt darauf sehen, basieren tatsächlich unsere wichtigsten politischen Konfrontationen auf unterschiedliche Bewertungen des Nichtwissens oder der Unsicherheit des Wissens: In der Gesellschaft konkurrieren verschiedene Bewertungen der Angst, der Hoffnung, der Erwartungen, des Vertrauens, der Krisen, die nicht auf eine bloße Objektivität anweisen. Als Effekt dieser Polemik wird auf

diejenigen Dimensionen des Nichtwissens fokussiert, die die Entwicklung der Wissenschaft mit sich bringt: unbekannte Folgen, ungelöste Entwicklungen, die Grenzen ihre Gültigkeit...

Die Kontroversen betreffen üblicherweise nicht so sehr das Wissen an sich, sondern das Nichtwissen, das unausweichlich dazugehört. Wer das gegnerische oder dominante Wissen anfechtet, tut gerade das: *“drawing attention to ignorance”* (Stocking 1998), unterstreicht das was wir nicht wissen. Diese “Politisierung des Nichtwissens” (Wehling 2006) wurde deutlich seit den Kontroversen über Technologiepolitik in den 70er Jahren. Nicht nur die Erkenntnis der Relevanz des Unbekannten wurde größer, sondern deren Wahrnehmung und die dazugehörige Bewertung wurden ständig gegensätzlicher. Was für die einen ein Grund zur Furcht war, erweckte bei anderen verheißungsvolle Perspektiven. Während manche über ein vorläufiges Wissensdefizit sprachen, empfanden andere, dass es Dinge gibt, die wir nie erfahren werden. Dies geschah zu einem Zeitpunkt, in dem uns allen bewusst war, dass die Wissenschaft nicht nur Wissen, sondern auch Unsicherheit bewirkt, “blinde Zonen” und Nichtwissen. Die Ängste und Beunruhigungen eines beträchtlichen Teils der Öffentlichkeit sind nicht komplett grundlos, wie die Verfechter einer “Null-Risiko”-Technologie vermuten. Hinter der öffentlichen Ablehnung gewisser technologischer Optionen besteht häufig eine Wahrnehmung von Unkenntnissen oder Unsicherheiten, welche von der Wissenschaft und der Technik anerkannt werden sollten. Bei diesen und ähnlichen Konflikten, stoßen unterschiedliche oder gar gegensätzliche Wahrnehmungen des Nichtwissens aufeinander.

Seitdem drehen sich unsere großen Dilemmas um das *“decision-making under ignorance”* (Collingridge 1980). Das Treffen von Entscheidungen unter Ignoranzbedingungen verlangt nach neuen Arten der Begründung, Rechtfertigung und Beobachtung der Konsequenzen. Wie können wir uns vor Gefahren schützen, gegen die man per Definition nicht weiß, was zu tun ist? Und, wie kann man der Vielfalt der Wahrnehmungen des Nichtwissens gerecht werden, wenn wir die Größenordnung und die Relevanz des Unbekannten nicht kennen? Wie viel Nichtwissen können wir uns leisten, ohne

unkontrollierbare Bedrohungen freizusetzen? Wieviel Ignoranz kann gefährlich werden und wieviel können wir als harmlos abtun? Welcher Gleichgewichtspunkt zwischen Kontrolle und Zufall ist verantwortungsvoll tolerierbar? Ist Unbekannte eine Freikarte zum Handeln, oder im Gegensatz, eine Warnung höchste Vorsicht walten zu lassen?

Gesellschaften treten dem Nichtwissen in verschiedenen Weisen entgegen: die Öffentlichkeit reagiert mit Dissens; Zeitlich gesehen reagieren sie mit vorläufigen Kompromissen; objektiv mit dem Imperativ sich gegen das schlimmste zu schützen (Japp 1997, 307). Denken wir an das "Vorsichtsprinzip" mancher internationalen Abkommen, wie die Rio-Klima-Erklärung. Diesen Verträgen nach darf die Einführung von effizienten Maßnahmen zur Vermeidung schwerer und unwiderruflicher Schäden, wie die des Klimawechsels, nicht aufgrund der Tatsache vertagt werden, dass es keine absolute wissenschaftliche Gewissheit gibt. Das Vorsichtsprinzip ist aber dennoch umstritten, da deren Auslegungen weit auseinanderliegen. Auf jeden Fall sind diese Art der Auslegungen interessant, insoweit, dass sie die Folgen einiger Entscheidungen ausloten, die Wahrscheinlichkeit von gewissen Schäden evaluieren, die Kriterien, unter welchen diese Folgen akzeptabel sind, untersuchen oder die Suche nach möglichen Alternativen vorantreiben.

Es entsteht somit das Paradoxon, dass die Wissensgesellschaft die Autorität des Wissens beendet hat. Wissen wird pluralisiert und dezentralisiert, es wird fragiler und bestreitbarer. Aber diese Entwicklung betrifft notwendigerweise auch die Macht, denn wir waren daran gewöhnt, nach Bacons Prinzip, dass das Wissen die Macht bestärkt, während jetzt das Gegenteilige geschieht und Wissen die Macht schwächt. Was geschehen ist, ist eine wachsende Pluralisierung und Streuung des Wissens, womit es entmonopolisiert und sehr anfechtbar wird. Neben der traditionellen Art der wissenschaftlichen Produktion in den Universitäten, entstehen neue Arten des Wissens durch eine Vielfalt von Agenten in der Gesellschaft, wie das Wissen der NGOs, die berufliche Ausbildung der Bürger, das Wissen der verschiedenen gesellschaftlichen Subsysteme, der

Zugang zur Information, die Vervielfältigung des Expertenwissens...

In dem Masse, in dem sich die Wissensproduktion vervielfältigt, verringert sich auch die Möglichkeit, diese Prozesse zu kontrollieren. Die Wissensgesellschaft definiert sich dadurch, dass eine steigende Anzahl von Akteuren über eine auch steigende Anzahl von Wissensarten verfügt, was diese Akteure in die Lage versetzt, das eigene Wissen gegenüber den Handlungen der Regierungen gelten zu machen. Anstelle einer Steigerung der Gewissheiten, erhalten wir eine Vielfalt von Stimmen, die eine kakophonische Diskussion über ihr vermeintliches Wissen und ihre Definitionen des Nichtwissens führen. Jasanoff nannte "Technologies of humility" (2005, 373) diese institutionelle Denkart, die Grenzen des menschlichen Wissens – das Unbekannte, das Unsichere, das Zweideutige und das Unkontrollierbare- zu erfassen und die Grenzen der Voraussagungen und der Kontrolle zu erkennen. Diese Art der Denkweise bewirkt, dass die Möglichkeit unvorgesehener Folgen, berücksichtigt wird, dass die normativen Aspekte der technischen Entscheidungen öffentlich werden und dass die Notwendigkeit der Anerkennung von vielfältigen Standpunkten und der kollektiven Wissensbildung erfolgt.

In diesem Kontext braucht man eine Wissenschaft, die mit der Politik bei der Handhabung der Unbestimmtheit zusammenarbeitet (Ravetz 1987, 82), anstelle der traditionellen Wissenschaft, die meint "harte" Fakten zu liefern, die glaubt, dass das Unwissen zurückgeht und die der Politik sagt, was zu tun ist.

Hierfür muss eine reflexive Kultur der Unsicherheit entwickelt werden, die das Nichtwissen nicht als einen äußeren Bereich des noch unerforschten ansieht (Wehling 2004, 101), sondern als Bestandteil des Wissens und der Wissenschaft. Das Unbekannte, das unsichere Wissen, das gerade Wahrscheinliche, die nicht-wissenschaftlichen Formen des Wissens und die Ignoranz dürfen nicht als unperfekte Phänomene abgetan werden, sondern als Ressourcen (Bonss 2003, 49).

Es gibt Bereiche, in denen aufgrund des Fehlens eines sicheren und risikofreien Wissens, kognitive Strategien entwickelt werden müssen, um in der Unsicherheit agieren zu können. Unter den wichtigsten Wissensarten befinden sich die Risikobewertung und deren Handhabung und Mitteilung. Wir müssen lernen, uns in einer Umgebung zu bewegen, in der es keine klaren Beziehungen zwischen Ursache und Wirkung mehr gibt, sondern alles verschwommen und chaotisch ist .

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Prof. Ernst Pöppel





Presentation still missing

Dr. Wolf von Reden



Fraunhofer Institute for Telecommunications

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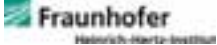


**How to Admit Failures
Science without Error Bars**

ars electronica, Linz,
September 5th, 2010

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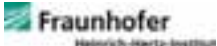


Outline

- A. Matter
- B. Five examples :
 - 1. Philosopher's Stone, Böttger (1701 ff))
 - 2. The cold fusion (Fleischmann, Pons (1989))
 - 3. The Sokal affair (1997)
 - 4. The Climagate and the IPCC-affair (2009)
 - 5. Vanishing (?) error bars in scientific publications
- C. What is the meaning and the role of experiments?
- D. What does science mean - in this context?
- E. Summary: A non-moral appeal

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A. Matter

(1)

There is an old demand for an intellectual

- be an authority
- know everything about your discipline
- once you're accepted as an authority,
 - ▶ your authority will be protected by your colleagues and
- you should – on the other hand –
 - ▶ protect the authority of your colleagues!

**This old professional ethic was always dishonest!
It will lead you to dismantle failures, mistakes and
errors just for the sake of the authority.**

A. Matter

(2)

People are often eager to share their views on science:

- without ever having done an experiment.
- without ever having tested an idea for themselves,
 - ▶ **using their own hands;**
- without ever having seen the results of that test;
 - ▶ **using their own eyes;**
- without ever having thought carefully about what those results mean for the idea they are testing,
 - ▶ **using their own brain.**

**To these people “science” is a monolith, a mystery,
and an authority, rather than a method.**

B. Scientific method

Francis Bacon was the first who brought experiments into the focus of scientific inquiry.

He demanded a **planned procedure** of investigating all things natural ... and this dedication probably led to his death, being killed – indirectly – by his own experiment.

In his work *The New Organum*, we see the development of the **scientific method**, consisting of procedures for isolating the form, nature or cause of a phenomenon, employing the 'method of agreement', 'the method of difference' and the 'method of concomitant variation'.

Francis Bacon

THE NEW ORGANON OR TRUE DIRECTIONS CONCERNING THE INTERPRETATION OF NATURE

...

*What the intellect needs, is not the scholastic method of syllogisms, which only enables a man to win arguments, but a means to '**command nature in action**', a form of induction which shall analyze experience and take it to pieces, and by due process of exclusion and rejection lead it to an inevitable conclusion.*



B. Examples

- Since that time, in natural science a scientific result should be – in principle - reproducible by other scientists.
- It is therefore the carefulness to document the measurement process in the community and by this to publish the conditions of the gain in knowledge as an essential part.
- So a claim is raised, that natural science by itself is running a error solving system and by this is spiralling upward from 'truth' to 'truth'...
- Five examples, better observations which are not at all balanced to clarify a problem of science or - to be precise – a problem of scientists.

1. The Philosopher's Stone vs. White Gold

Johann Friedrich Böttger 1682-1719,

- **An alchemist, who made it happen that silver coins transformed into golden ones.
Therefore he was forced to work for Augustus the Strong, Elector of Saxonia...**
- **But rather of creating gold, he succeeded to run a manufacture for white porcelain, which was the beginning of the production of white gold in Saxonia.**
- **But, he never told anyone, how he could once manage the Philosopher's Stone**



2. The Cold Fusion (1989)

Martin Fleischmann, Stanley Pons

The chemists at the University of Utah performed experiments to fusion H into He + energy using a palladium cathode and heavy water (D) within a calorimeter.

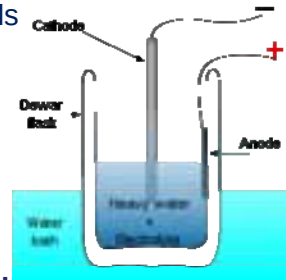
Actually current was applied continuously for many weeks, with the heavy water being renewed at intervals



The products formed via these decay pathways are:



... but, in fact no γ was detected!



2. The Cold Fusion (1989) (2)

In case of success any energy problem in the world should have been solved, but

- In fact there was energy produced but not by fusion of Deuterium
- Probably due to their finance situation, the scientists published their result firstly in a press magazine before lancing it to a peer-reviewed scientific journal
- The main point of critics in the community!
- And, essentially, even an improvement in equipment could not help to (re-)produce the effect they had claimed

So, the research in cold fusion concepts was stopped!

3. The Sokal-Affair

(1)

Alan D. Sokal**Transgressing the Boundaries :****Towards a Transformative Hermeneutics of
Quantum Gravity***published in 'Social Text' #46/47 pp. 217-252
(1996)*

3. The Sokal-Affair

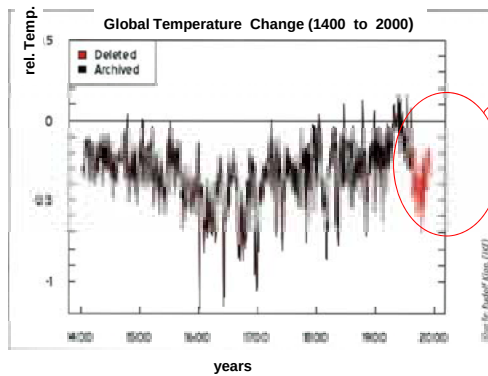
(2)

The paper had partly enthusiastic reaction.
But Sokal admitted shortly after the publication,
that it was just a parody. A fake to criticize the –
in those years – typical postmodern jargon in the
science and by the way wanted to discredit the
respectability and seriousness of postmodern
philosophers like *Jean Baudrillard*, *Gilles
Deleuze* and so on...

4. Climagate – IPCC-Affairs

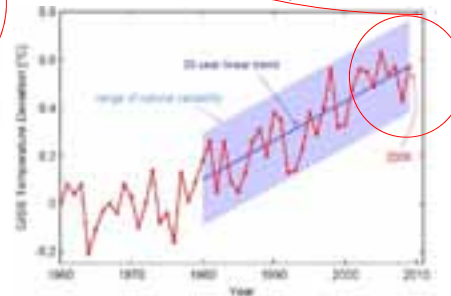
(1)

Measurements, only partly published



best fit or good reasons to hide the discrepancy?

Global prognosis of Temperature Change (last 30 Years)



expected trend curve with variations

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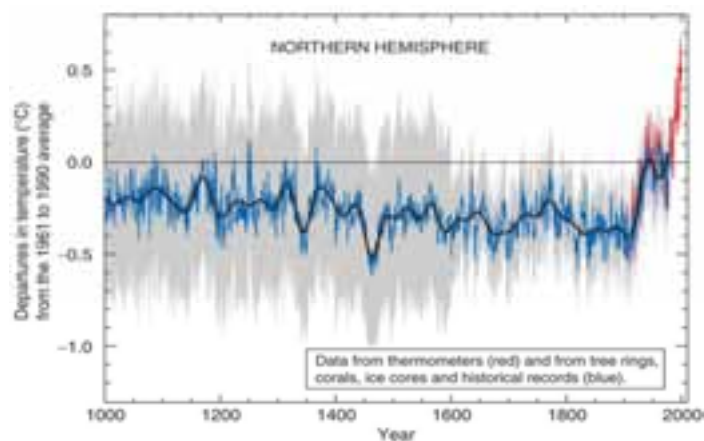
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4. Hockeystick-Curve – IPCC-Affairs

(2)

Micheal Mann's temperature-trend over the last 1000 years was not in all data statistically correct.



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4. IPCC-Affairs (3)

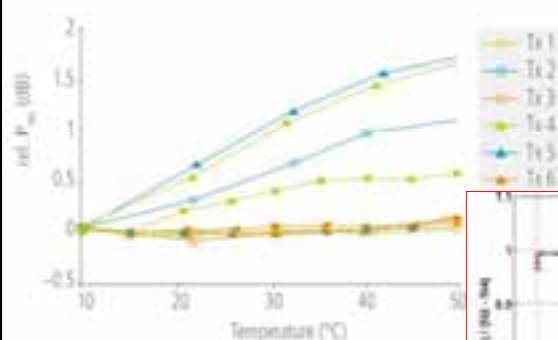
Phil Jones, former director of Climatic Research-Unit at the University of East Anglia in 2009:

"I've just completed Mike's Nature trick of adding in the real temps to each series in the last 20 years and for 1961 to hide the decline."

Robert Watson, former chair of IPCC, in 2010 :

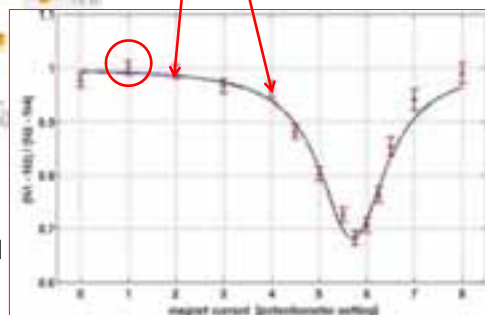
"The mistakes all appear to have gone in the direction of making it seem like climate change is more serious by overstating the impact. That is worrying. The IPCC needs to look at this trend in the errors and ask why it happened."

5. Measurements with/-out Error Bars? (1)



They give a general idea of how accurate a measurement is, or conversely, how far from the reported value the true (an error free) value might be.

Error bars are used as a graphical representation to indicate the error, or uncertainty in a reported measurement.



5. Measurements with/-out Error Bars? (2)

Engineers very often are not going to publish what they just have “**learned**” but that what they can **master**.

That can better be demonstrated by a curve with ‘affirmative’ character than by a publication of the hardly finished measuring process and its sometimes poor results.

Self-healing system in the natural science? (1)

These are five very different examples but they have at least one thing in common:

1. The science as a social system is to be reproached not having named dirty tricks fast and clearly enough.
2. Science as a social institution just trusts in its soft law of rationality and is afraid it would otherwise loose the public interest (.. and by this its financial support?).
3. There exists a distortion produced in community perception or meta-analyses by not publishing ‘uninteresting’, usually negative results, or results which go against the experimenter's prejudices, a sponsor's interests, or community expectations.

Self-healing system in the natural science? (2)

4. It seems that some scientists pay too much attention to their funding partners and so might in the sight of the funded institutions, for instance in the climate research a more catastrophic scenario be better to justify the money spend on this research.

Even if apparently the climate is no tame physical-statistical problem, but a wicked scientific-political-socio-cultural bunch of problems, which is even worse contaminated with moral.

That means that the 'truth' in scientific results or the outcome of a scientific approach can be essentially influenced by the interests of a financing systems.

Plato – The Allegory of the Cave

Did the scientists go from the so called republic of wisdom back inside of Plato's cave to look at and interpret the flickering shadows on the wall than to try out better tapping in the sun?



What is the meaning of experiments? (1)

Any experiment is principally a source of mistakes, a source of errors...

- 1. In the development of natural understanding there is not a theoretical hypothesis and an experimental set-up with its boundary conditions to verify or – more often – not to verify the proposition**
- 2. An experiment never stands for its own; its result is neither fact nor fiction, it is made of this just in the context of other experiments, later on**
- 3. The relationship between theory, experiment and instrument should undergo a non-trivial revision**

What is the meaning of experiments? (2)

A mantra:

- We are learning from our mistakes**
- We are learning with our errors**
- We are learning by our faults**

The outcome of an experimental set-up might in worse case be just a clash between a theoretical hypothesis and its result by running a measurement.

What is the meaning of experiments? (3)

How can we learn more than: **Something went wrong!**

This does not mean anything for the physical hypothesis under test!

But looking from 'outside' you can judge only the set of parameters and boundary conditions of the experiment

And by the error bars to be added to each graphical representation of the experimental outcomes you can catch the carefulness of the scientists involved, and you can get a hint of systematic uncertainties.

What is the meaning of experiments? (4)

And just starting by these uncertainties you have the chance to dare the next step in the more or less, but hopefully asymptotic process of understanding the natural phenomena.

So, these little 'bars of honesty' represent the future, a future of natural science.

What does science mean - in this context (1)

Any established science has the habit to press the knowledge into laws, which are not to be discussed any further!

But

1. Scientists are bound to methodological rules
2. These rules are obliged to find the 'truth'
3. Even if this claim to truth or - more simple - validity is a claim to power (which is to be criticized?!)
4. Science or at least epistemology have **to** have an empathical concept of truth

What does science mean - in this context (2)

5. 'Truth' is necessary as a regulative idea to distinguish between science and pseudo-science
6. ... because science has a practical duty
7. If there are two incommensurable theories collide in some aspects, ...
Then the claim to validity goes into a skid?!
8. But, is there a change to be seen from the 'culture of science' into a 'culture of research'?
(e.g. BSE-affair, swine-flu and and and)

What does science mean - in this context (3)

9. Then, instead of an autonomous separated science community, which knowledge is good to extinguish the fire of political passion or of subjectivity, to the controversies in the political scene scientific debates are joining.
10. Science might no longer be defined by its separate situation but described by its closeness to its environment.
11. Instead judging science by the absolute accuracy of its knowledge, it can be measured by the quality of its collective experience, which will be increased by all together.

What does science mean - in this context (4)

12. But even then, the core meaning of a scientific 'truth' lies still in the demand of **intersubjective obligingness**
13. That means, that every scientist has still to carry out (common) **methodological rules**
14. This is a necessary demand because there exist a **practical meaning** in science:

**There is the duty to 'enlighten' '
- not just the society -
but the people !**

D. As a Summary: A Non-Moral Appeal

- Science is legally and without any doubt under the pressure of justification by the financier.
- More or less expected results are part of a technique to survive and will therefore be published.
- The 'prey community' of the scientists should better come back to a behavior appeal formulated by Karl Popper in a broadcast interview in 1982

Popper's Appeal (1982)

In twelve basic statements Sir Karl Popper formulated his ideal for scientists as professional ethics
(see the german slides below)

These statements can be reduced essentially to three main demands:

- 1. In science there are no authorities!**
- 2. You always should try to avoid mistakes resp. errors, even if this is – in fact – impossible!**
- 3. Be self-critical and your critics should never be personal, but rational and specific!**

Thank you for your kind attention

We put science into action



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Poppers Appell (1)

1. Unser objektives Vermutungswissen geht immer weiter über das hinaus, was ein Mensch wissen kann. **Es gibt daher keine Autoritäten.** Das gilt auch innerhalb von Spezialfächern.
2. Es ist unmöglich, alle Fehler zu vermeiden oder auch nur alle an sich vermeidbaren Fehler. **Fehler werden dauernd von allen Wissenschaftlern gemacht.** Die alte Idee, dass man Fehler vermeiden kann und daher als Autorität verpflichtet ist, sie zu vermeiden, muss revidiert werden. Sie ist selbst fehlerhaft

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Poppers Appell

(2)

3. Natürlich **bleibt es unsere Aufgabe, Fehler nach Möglichkeit zu vermeiden**. Aber gerade, um sie zu vermeiden, müssen wir uns vor allem klar darüber werden, wie schwer es ist, sie zu vermeiden und dass es niemand völlig gelingt. Es gelingt auch nicht den schöpferischen Wissenschaftlern, die von ihrer Intuition geleitet werden. Die Intuition kann auch irreführen.

Poppers Appell

(3)

4. Auch in den am besten bewährten unter unseren Theorien können Fehler verborgen sein. Und **es ist die spezifische Aufgabe des Wissenschaftlers, nach solchen Fehlern zu suchen**. Die Feststellung, dass eine gut bewährte Theorie oder ein viel verwendetes praktisches Verfahren fehlerhaft ist, kann eine wichtige Entdeckung sein.

Poppers Appell

(4)

5. Wir müssen deshalb unsere **Einstellung zu unseren Fehlern ändern**. Es ist hier, wo unsere praktische ethische Reform beginnen muss..
6. Denn die alte berufsethische Einstellung führt dazu, unsere Fehler zu vertuschen und zu verheimlichen und so schnell wie möglich zu vergessen.
7. Das neue Grundgesetz ist, dass wir - um zu lernen, Fehler möglichst zu vermeiden - gerade von unseren Fehlern lernen müssen. **Fehler zu vertuschen ist daher die größte intellektuelle Sünde.**

Poppers Appell

(5)

8. Wir müssen deshalb dauernd nach unseren Fehlern Ausschau halten. Wenn wir sie finden, müssen wir sie uns einprägen, sie nach allen Seiten analysieren, um ihnen auf den Grund zu gehen. **Die selbstkritische Haltung und die Aufrichtigkeit werden damit zur Pflicht.**

Poppers Appell

(6)

9. Da wir von unseren Fehlern lernen müssen, so müssen wir es auch lernen, es anzunehmen, ja, dankbar anzunehmen, wenn andere uns auf unsere Fehler aufmerksam machen. Wenn wir andere auf ihre Fehler aufmerksam machen, so sollen wir uns immer daran erinnern, dass wir selbst ähnliche Fehler gemacht haben wie sie. Und wir sollen uns daran erinnern, dass **die größten Wissenschaftler Fehler gemacht** haben. Ich will sicher nicht sagen, dass unsere Fehler gewöhnlich entschuldbar sind. Es ist menschlich unvermeidbar, immer wieder Fehler zu machen.

Poppers Appell

(7)

10. Wir müssen uns klar werden, dass **wir andere Menschen zur Entdeckung und Korrektur von Fehlern brauchen** und sie uns. Insbesondere auch Menschen, die mit anderen Ideen in einer anderen Atmosphäre aufgewachsen sind.
11. Wir müssen lernen, dass **Selbstkritik die beste Kritik ist**, dass aber die Kritik durch andere eine Notwendigkeit ist. Sie ist fast ebenso gut wie Selbstkritik.

Poppers Appell

(8)

12. Rationale Kritik muss immer spezifisch sein. Sie muss spezifische Gründe angeben, warum spezifische Aussagen, spezifische Hypothesen falsch zu sein scheinen oder spezifische Argumente ungültig. Sie muss von der Idee geleitet sein, der objektiven Wahrheit näher zu kommen. **Sie muss in diesem Sinne unpersönlich sein.**

Dr. Martin Richartz / Dr. Serafine Lindemann



Manufactured Demand

What it means to grow a multi-billion Dollar industry around bottled water





naive

It's Just Water

IMPORTED • NON DONATED



chris jordan

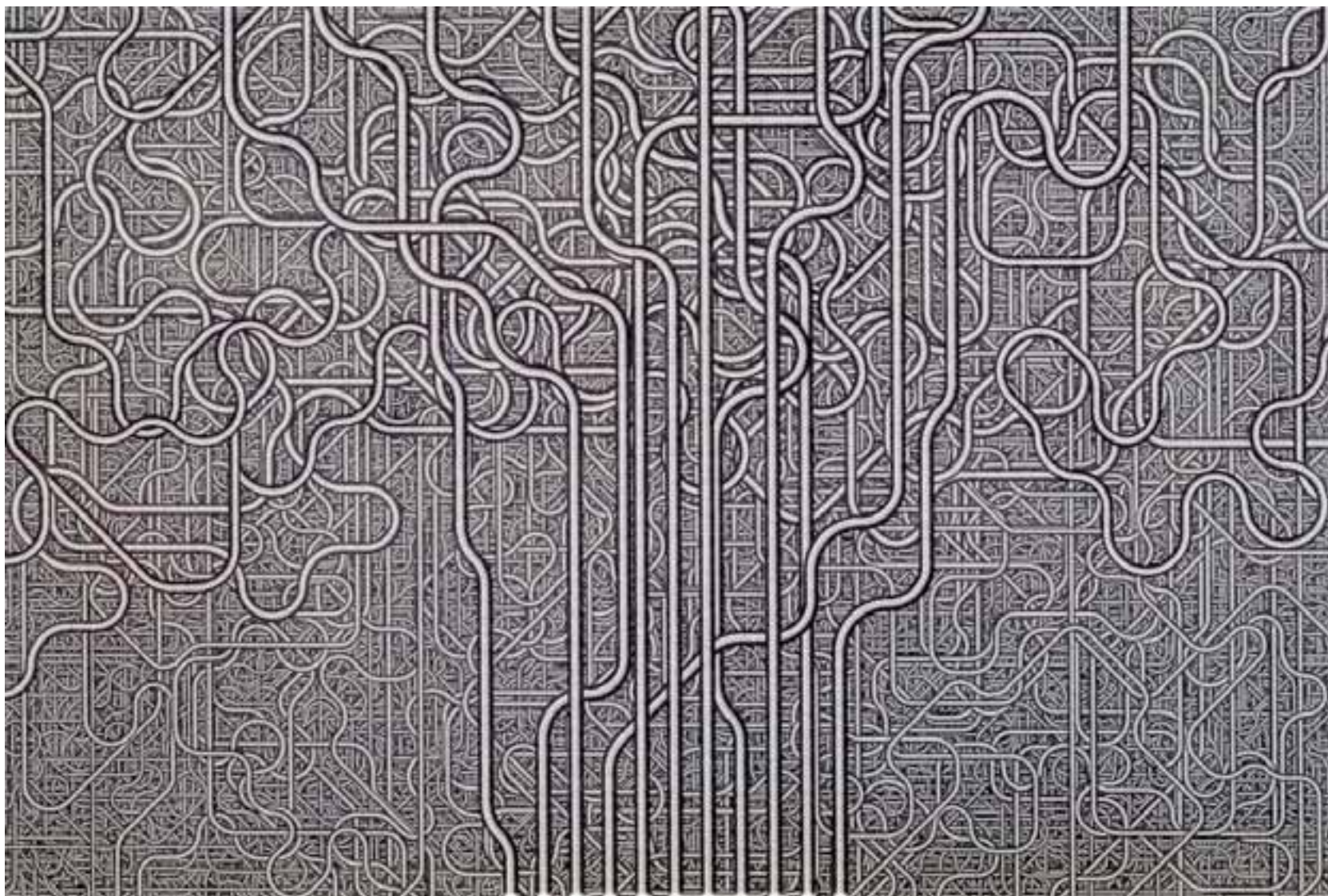




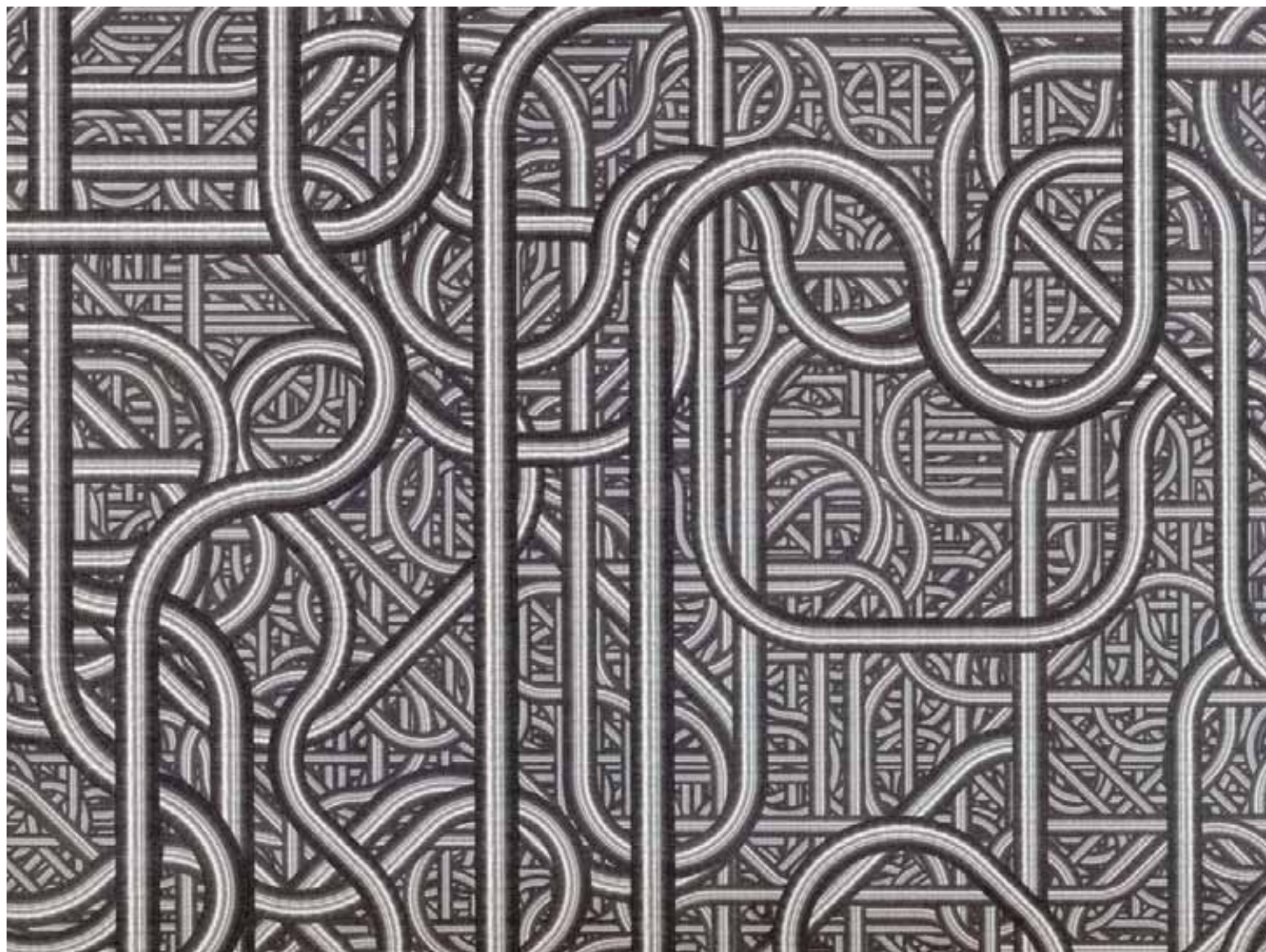


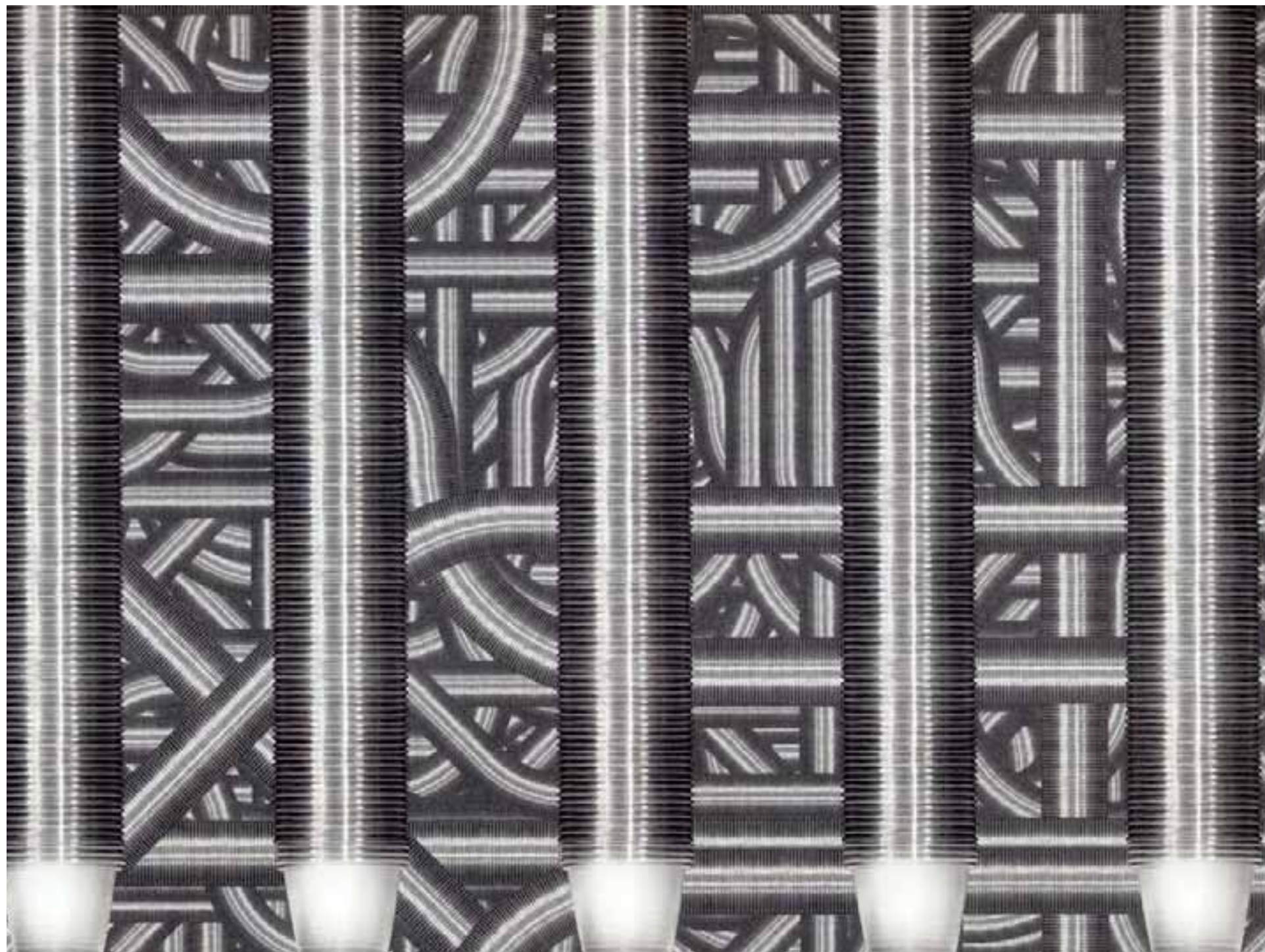
Depicts two million plastic beverage bottles,
the number used in the United States every five minutes.

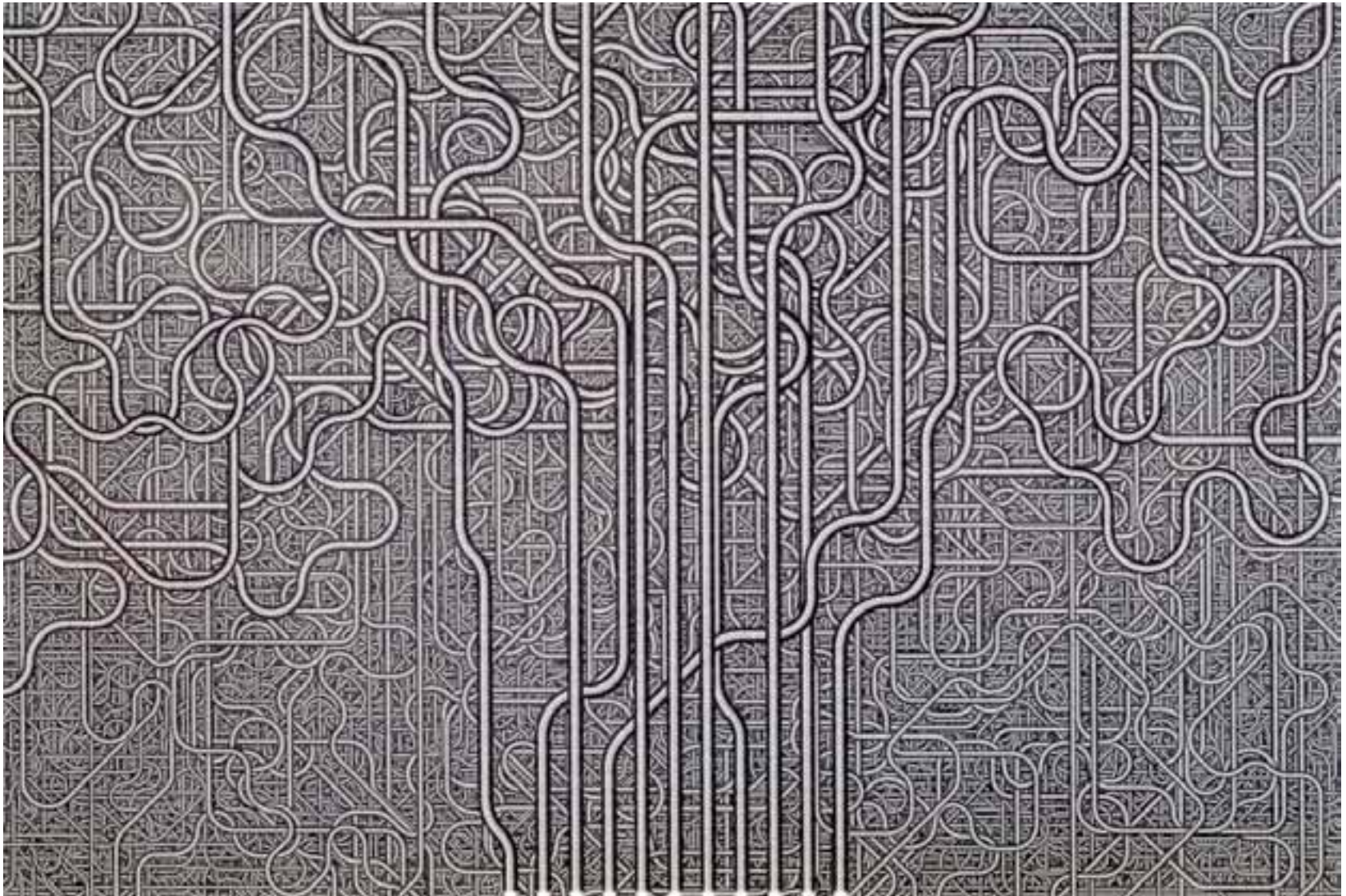
Economy of Scale?



chris jordan







Depicts one million plastic cups,
the number used on airline flights in the United States every six hours.



chris jordan – Midway: Message from the Gyre



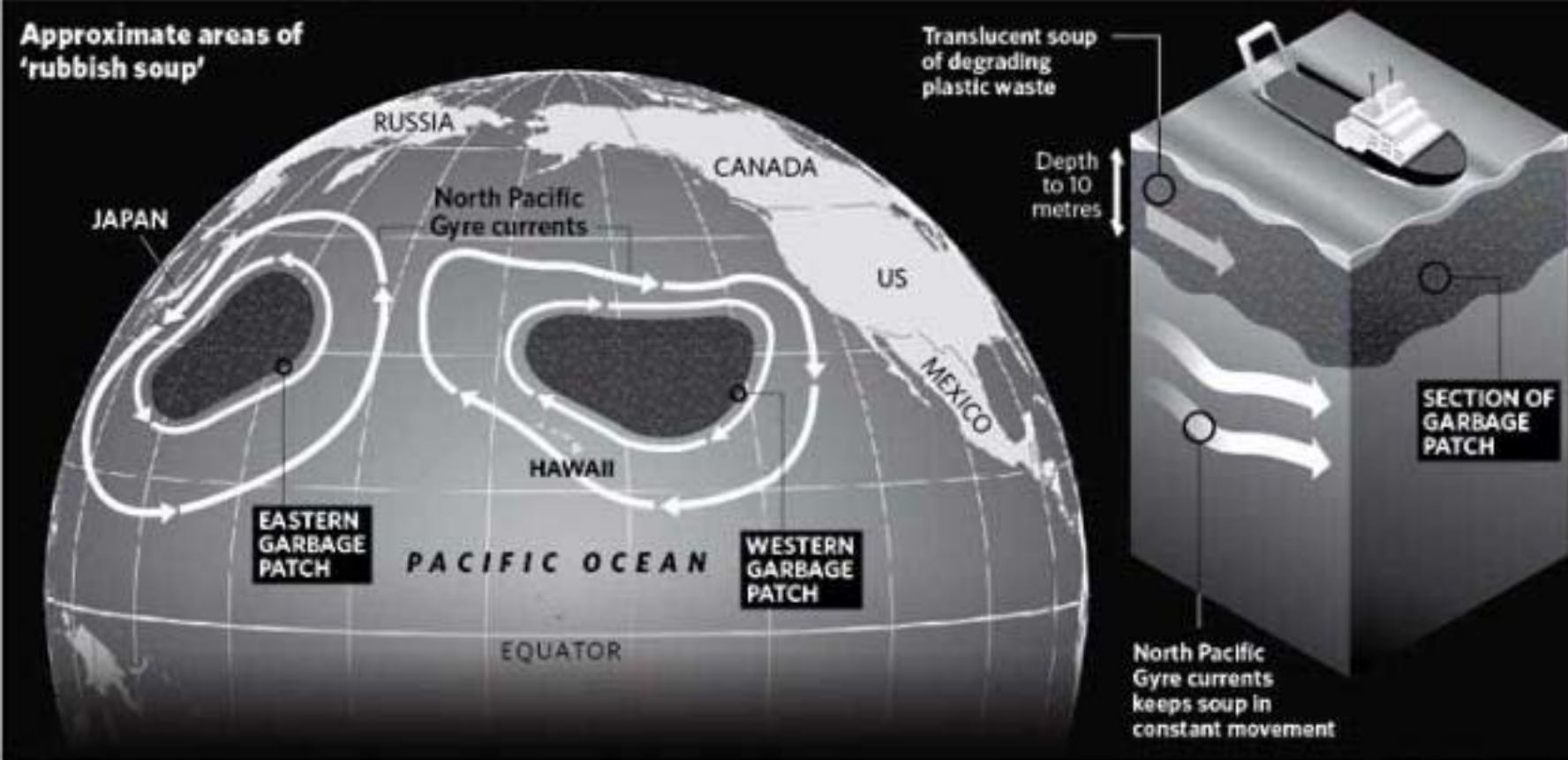




Out of sight, out of mind

The continent-sized vortex of plastic waste blighting the Pacific

Approximate areas of
'rubbish soup'



Source: Greenpeace

Graphic: John Papadimitriou, John Bradley

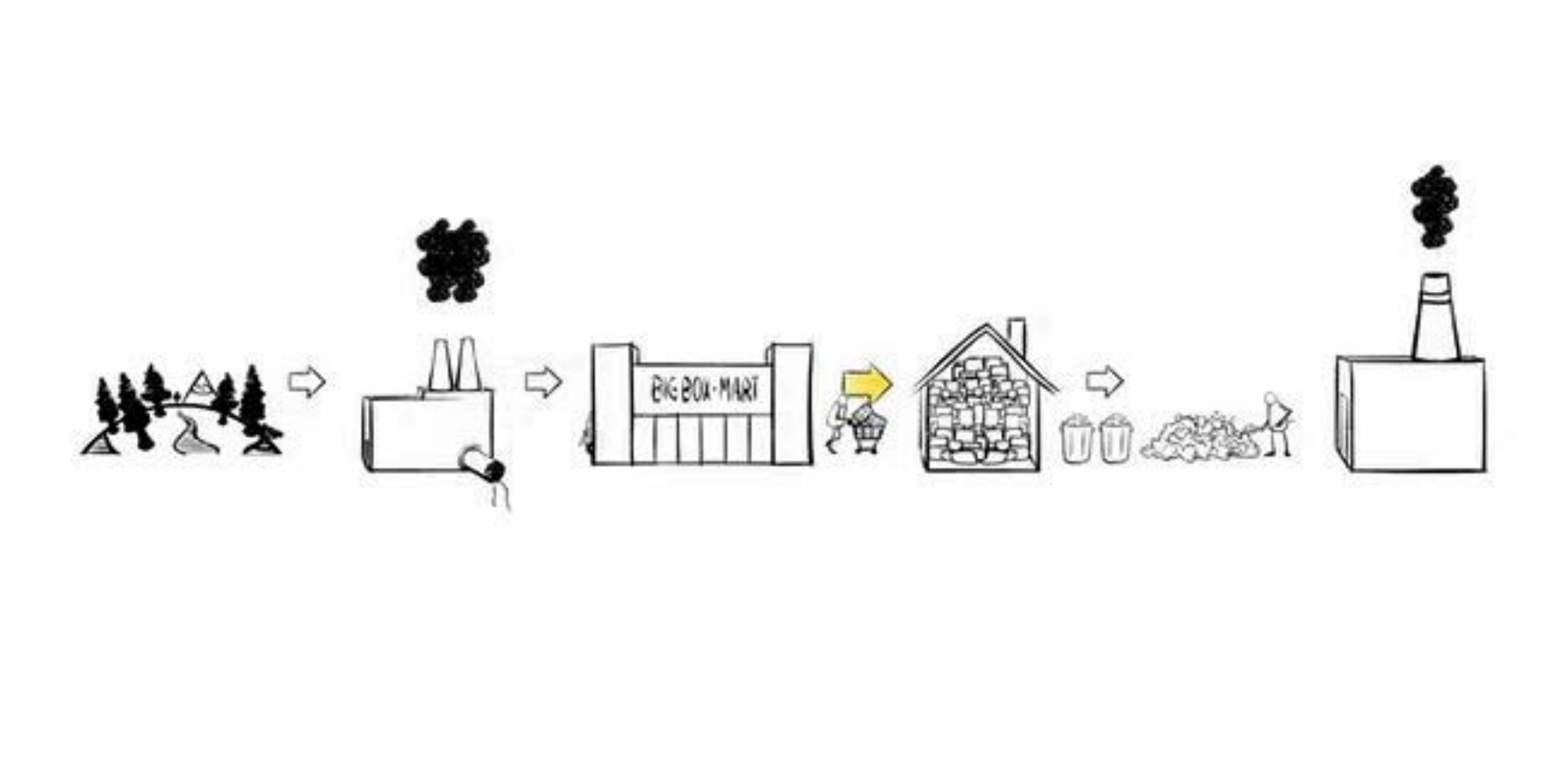


<http://storystuff.org/bottledwater>

l liter tap water (Berlin)	€ 0,005
l liter bottled water (Cafeteria)	€ 2,00

"THE BIGGEST ENEMY IS TAP WATER."











<http://storystuff.org/bottledwater>



Disaster relief
as source of growth?







Dr. Serafine Lindemann

Curator, artcircolo Kunstprojekt GmbH

Dr. Martin Richartz

Senior Technology Manager, Vodafone Group R&D

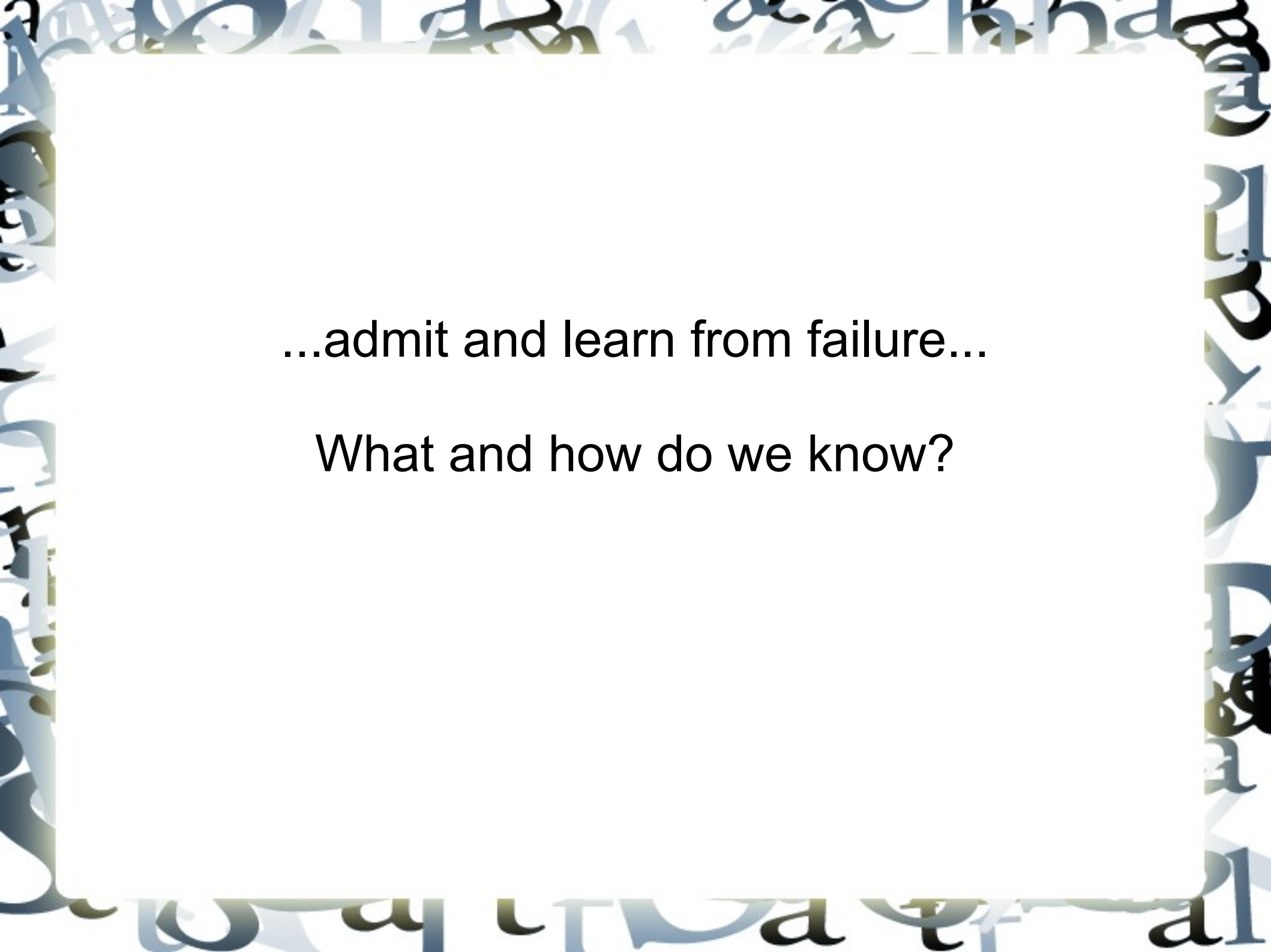
Dr. Viktor Winschel



A decorative border composed of various stylized, overlapping letters in shades of blue and grey, framing the central text area.

Towards a language for the
ECONOMICS of ECONOMICS

Viktor Winschel
Ars Electronica
2010

A decorative border surrounds the central text area, composed of various stylized letters and symbols in shades of blue and grey.

...admit and learn from failure...

What and how do we know?

Three Key Lectures

- Hellwig
 - no appropriate mathematics
 - no appropriate monetary theory
- Von Hagen
 - differential equations
 - constitution of central bank
- Vaubel $\leftrightarrow$ Program $\leftrightarrow$ Who I am?
 - There is only „Natural Language Economics“
 - constitution of constitution

The Mess

$$p(s_{t-1}|y_{1:t-1}) = \mathcal{N}(s_{t-1}; s_{t-1|t-1}, \Sigma_{t-1|t-1}^s),$$

the prior density

$$p(s_t|y_{1:t-1}) = \mathcal{N}(g(s_{t-1}, e_t); s_{t|t-1}, \Sigma_{t|t-1}^s)$$

is characterized by its first two moments,

$$(S.19) \quad s_{t|t-1} = \int \int g(s_{t-1}, e_t) \mathcal{N}(s_{t-1}; s_{t-1|t-1}, \Sigma_{t-1|t-1}^s) \mathcal{N}(e_t; 0, \Sigma_e) ds_{t-1} de_t,$$

$$(S.20) \quad \Sigma_{t|t-1}^s = \int \int g(s_{t-1}, e_t) g(s_{t-1}, e_t)^T \mathcal{N}(s_{t-1}; s_{t-1|t-1}, \Sigma_{t-1|t-1}^s) \\ \times \mathcal{N}(e_t; 0, \Sigma_e) ds_{t-1} de_t - s_{t|t-1} s_{t|t-1}^T,$$

where T denotes a transpose and Σ_e is the covariance matrix of the state shocks. The measurement density of the observables is given by

$$p(y_t|y_{1:t-1}) = \mathcal{N}(y_t; y_{t|t-1}, \Sigma_{t|t-1}^y),$$

where the expected value is

$$(S.21) \quad y_{t|t-1} = \int m(s_t) \mathcal{N}(s_t; s_{t|t-1}, \Sigma_{t|t-1}^s) ds_t$$

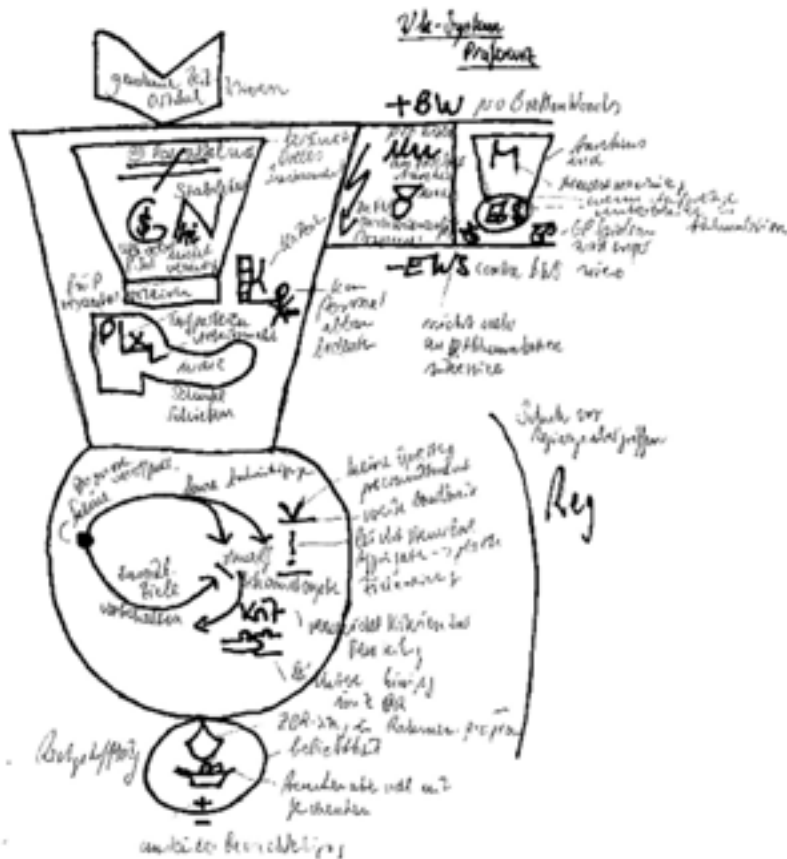
and the covariance is

$$(S.22) \quad \Sigma_{t|t-1}^y = \int m(s_t) m(s_t)^T \mathcal{N}(s_t; s_{t|t-1}, \Sigma_{t|t-1}^s) ds_t + \Sigma_e - y_{t|t-1} y_{t|t-1}^T,$$

where Σ_e is the covariance matrix of the measurement shocks. We also need the covariance between the observed and the unobserved variables

$$(S.23) \quad \Sigma_{t|t-1}^{sy} = \int s_t m(s_t)^T \mathcal{N}(s_t; s_{t|t-1}, \Sigma_{t|t-1}^s) ds_t - s_{t|t-1} y_{t|t-1}^T.$$

Cope with Complexity



- Represent 1200 DinA4
- Query fast, complete
- → 180 h Free Speech
- In and Out of Moebius
- Concept Matching
- Analogical Reasoning

1955 = 2010 → 2020 PostAlchemy?

Scientific Method in Economics

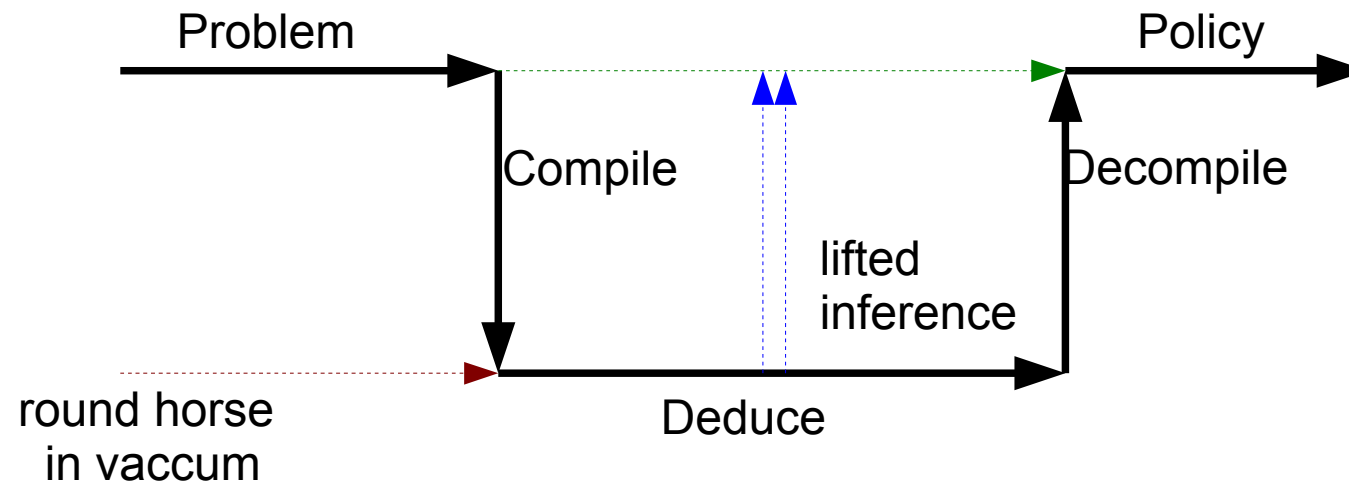
By ROBERT T. PATTERSON

ECONOMISTS COMPLACENT with the status of economics as a science should be disturbed by this book's¹ forthright thesis. It declares that economics "is in the twilight zone that chemistry passed through before the alchemists were finally discredited by the accumulating scientific findings of the modern age," and that it "will not mature as a science until much that today passes for economic knowledge has similarly been superseded." It is a scandalous state of affairs, the author observes, that "economists have not yet agreed upon the tests that economic inquiry should meet. In a manner of speaking, economists have not answered the question, **What is acceptable economic 'knowledge'?**" To supplement his own study of that basic epistemological problem Mr. Harwood includes ably written papers by Dr. May Brodbeck and Dr. Richard S. Rudner.

In the natural sciences method has evolved from child-like acceptance of revelation and vision, through primitive word-magic, the use of proverbs, and the phrase-juggling of ancient philosophers and medieval scho-

¹ *Reconstruction of Economics*. By E. C. Harwood. Great Barrington, Mass.: American Institute for Economic Research, 1955, 112 pp., \$1.00.

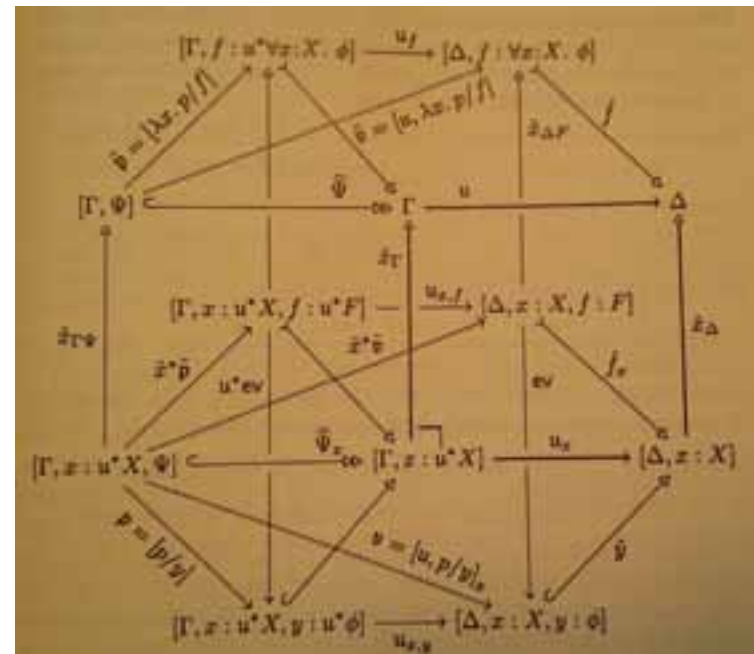
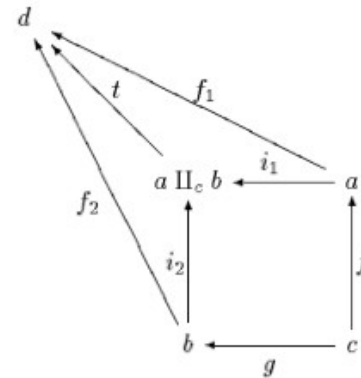
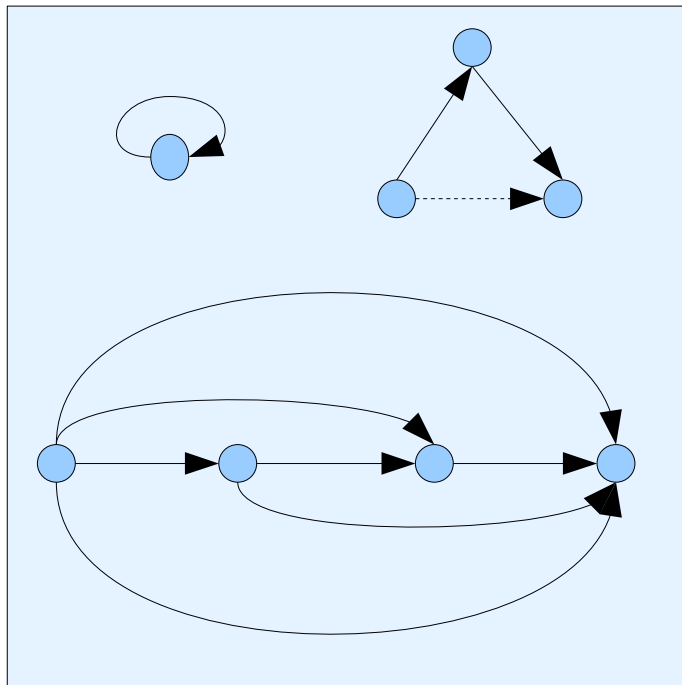
Policy Production



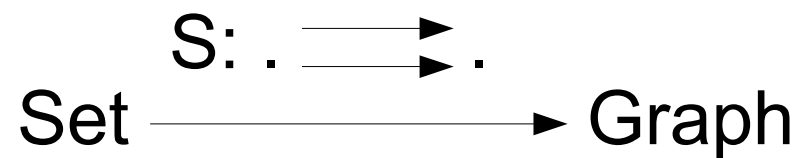
Key Questions

- Translation $\rightarrow$ Category Theory
- Knowledge $\rightarrow$ Relational Economics
- Economics of Economics $\rightarrow$ Coalgebra
- Econometrician in Model $\rightarrow$ Microcosm Principle
- Local Mathematics $\rightarrow$ Local Worlds, Topos

Category Theory



Me = Identity = S = Gnothi Sauton



Economics

- Homo Oeconomicus
- Accounting
- Division of Labor
- Production
- Decentralization
- Networks
- Expectations
- Aggregation
- Institutions
- Politics
- Language
- Education

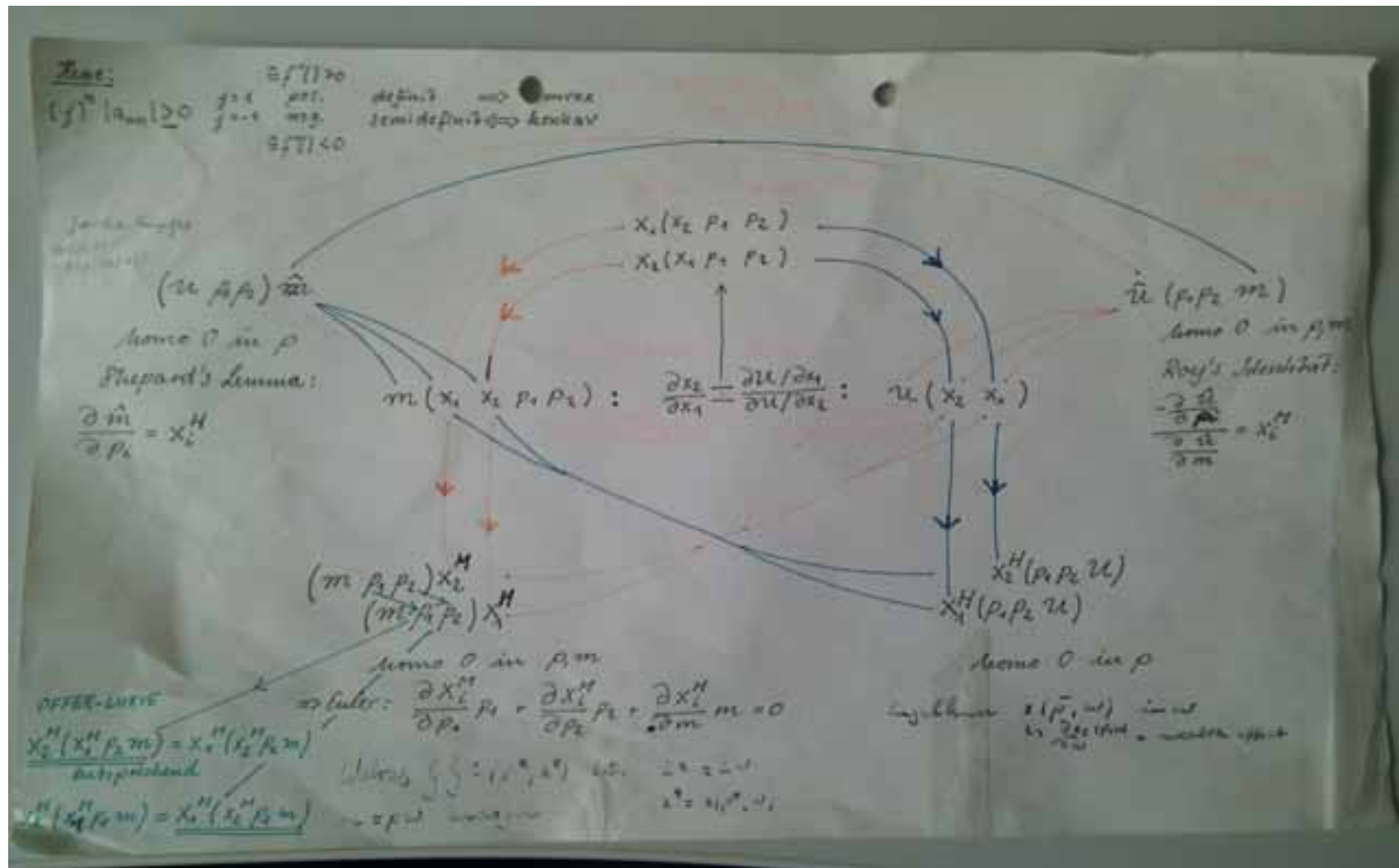
Homo Oeconomicus

- Cognition
 - Nonmonotonic Reasoning
 - Abduction
 - Analogical Reasoning
 - Concept Matching
- Artificial Intelligence
 - Robots are more „human“ than
 - homo oeconomicus

Double Entry Accouting

- Why no algebra? per/an $\leftarrow \rightarrow$ categorical duality
 - Why double AND NOT Sqrt(-1) ?
 - Why Pekuniar Integers AND NOT Belief, Model, Extinction of Gorilla
- Constraint Satisfaction / Truth Maintaining as Software why not economically interpreted?
- Modularization $\rightarrow$ Banking Industry Renaissance
- Economist: Mother Earth's Metabolism-Repair Controler

Formulas For Free



Alchemy of Economics

- Friedman's Non-100\$ $\leftrightarrow$

„The biggest fish in the river gets that way by never being caught.“, Tim Burton

- No Free Lunch $\leftrightarrow$

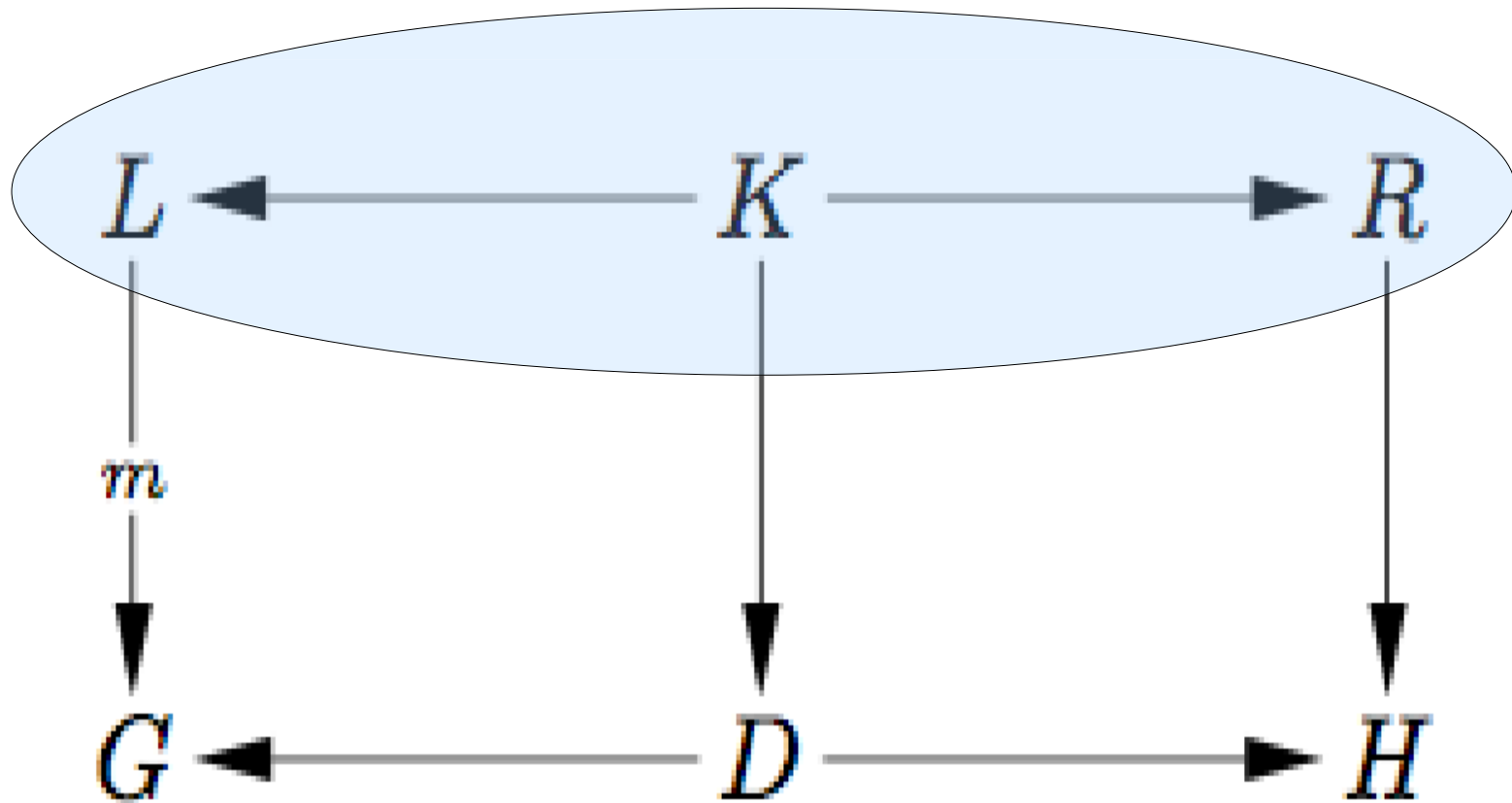
Dual Formulas For Free

- „Economics is extremely useful as a form of employment for economists.“

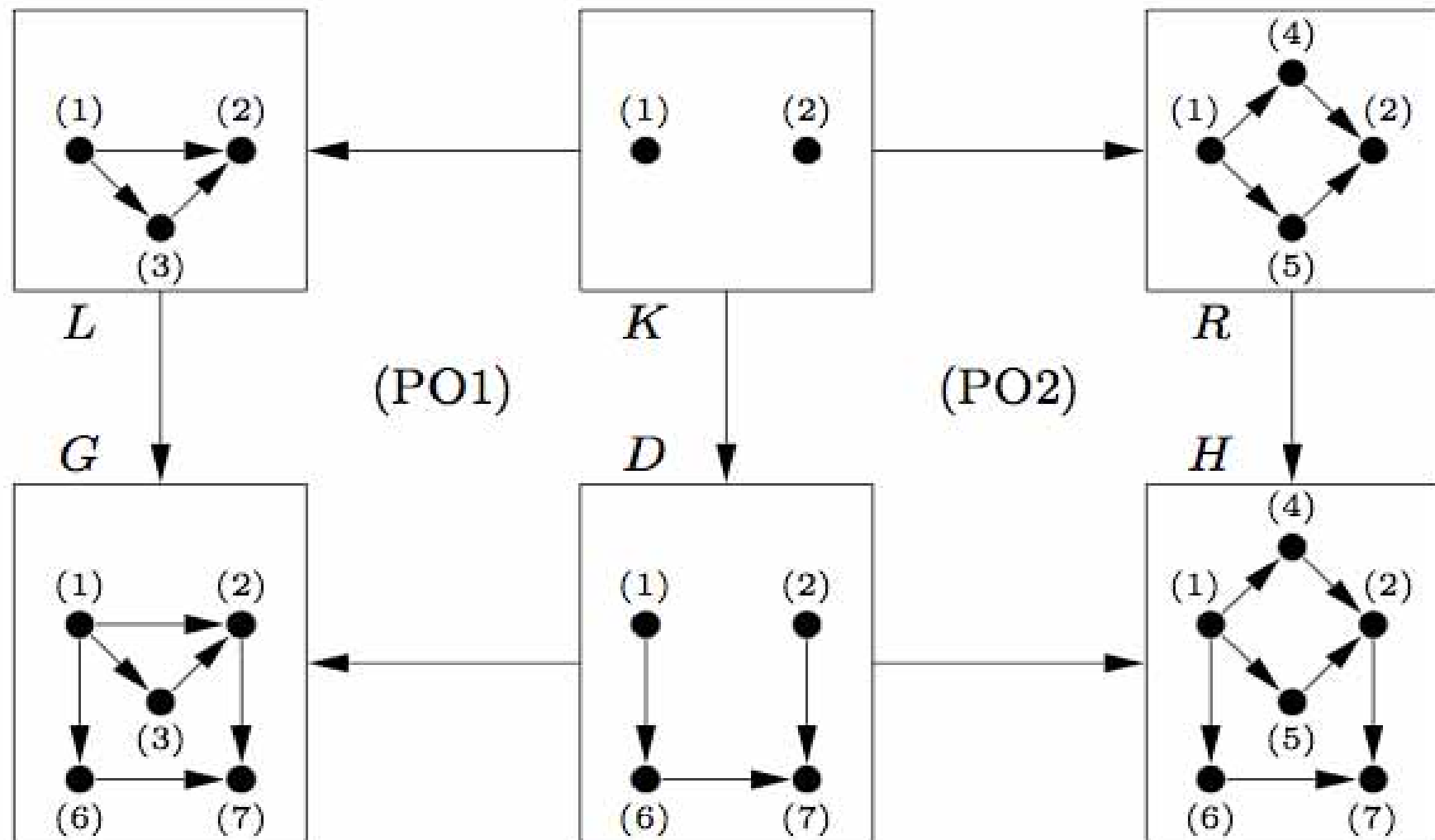
Economic Production Functions

- Marriage Market, Children Production, Slavery
- $f(g(x))=(fg)(x) \leftrightarrow$ – Calculus = Turing Machine
- Inout=Merger=Sequential=Parallel=Nonsense
- No aggregation, No synergies, No embedding
- $\rightarrow$ Double Pushout Graph Transformation =
Generalized Economic Production =
Nonlinear Chomsky (Linguistics) Grammar

Graph Transformation



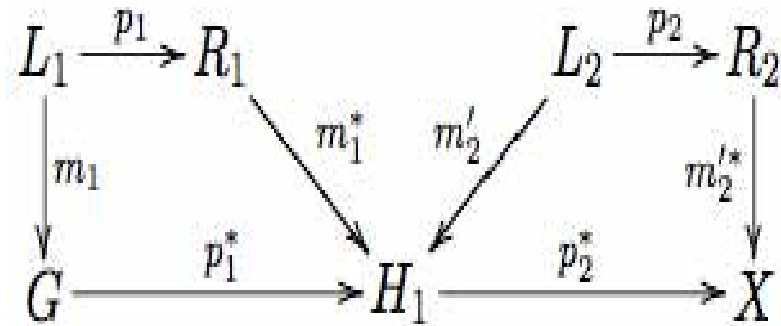
Double Pushout Graph Transformation



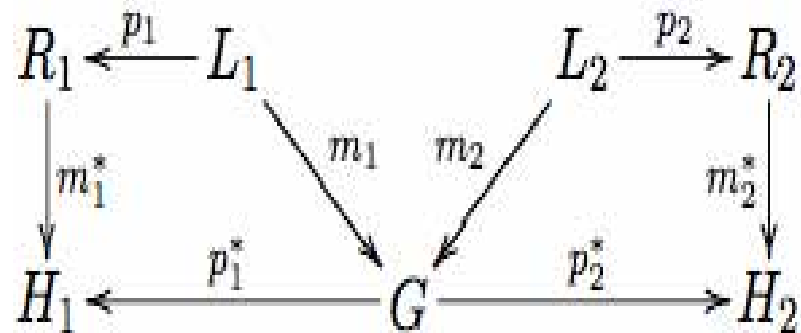
Devision of Labor - Decentralization

- General Equilibrium is about Communism
- Decentralization
 - Identify Common Substructures
 - Sequentialize – Devision of Labor
 - Parallelize – Decentralize
 - Systems Biology:
Different Hierarchical Time Scales
→ No Central Control
- Concurrency Computing $\leftrightarrow$ Internet

Sequentialize - Parallelization



Sequential Independence



Parallel Independence

Networks

- Organization – Rashevsky
- What is Life? - Robert Rosen
- What is a Company? WHY?
- What is Money? WHY?

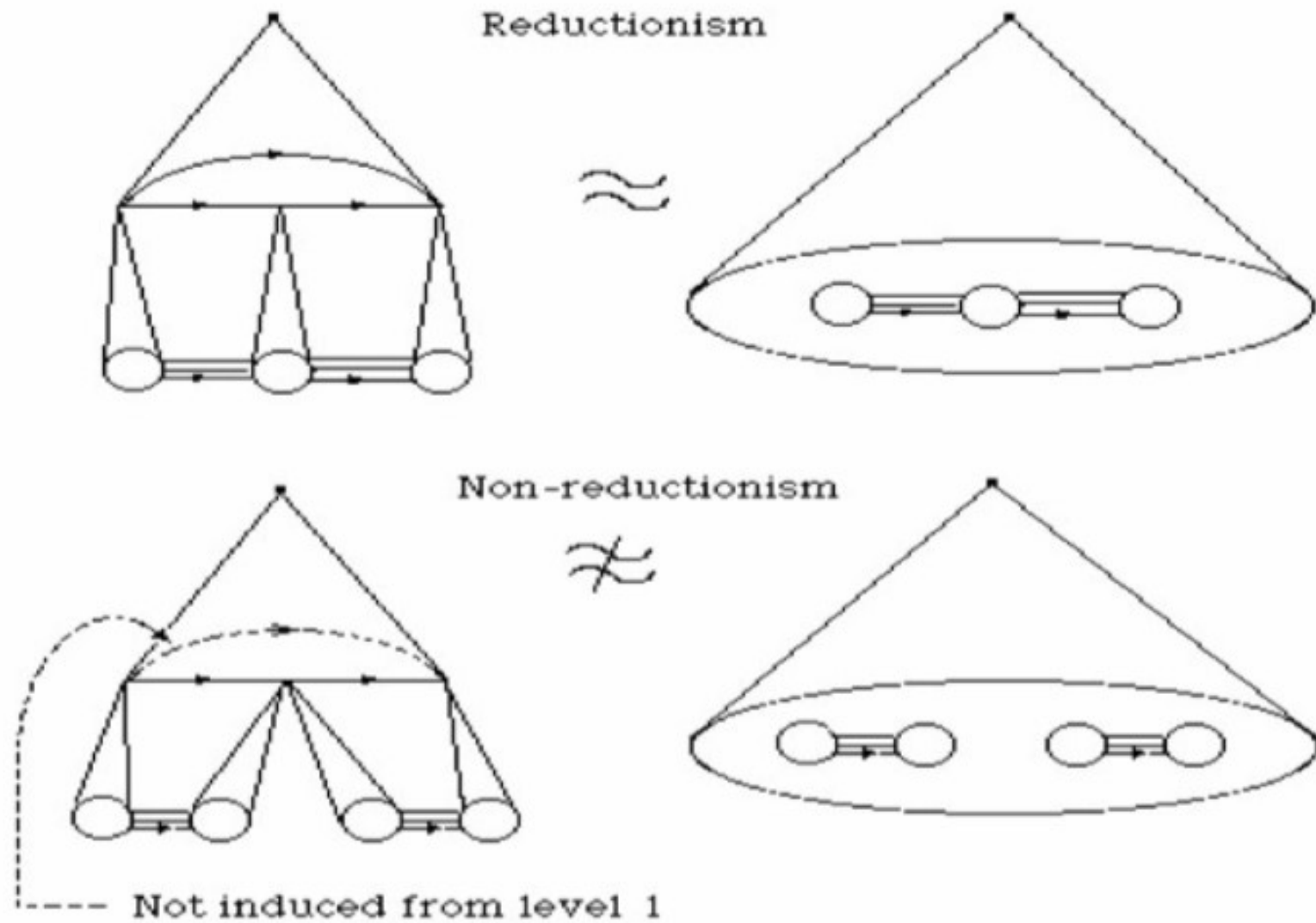
Expectations

- I belief that you belief that I belief
- $a=a+1 \leftrightarrow a=1:a = [1 : [1 : [1 \dots]]] = [1 \ 1 \ \dots]$
- Non-well founded sets – Russel Paradox
- Bisimulation $\leftrightarrow$ Observational Equivalence
- No ponzi game condition? $\leftrightarrow$ Count down Infinity
- Lucas Critique – System in System ?
- Diff.Eq. Meta Language for Object Language ?

Aggregation - Emergence

- Goguen: Widgets Behaviour $\leftrightarrow$ Categorical Limit
- Purchasing Power of Money $\leftrightarrow$ Emergent Prop.
- Climate Research $\leftrightarrow$ Model Merging
- Consciousness
- Life
- Universe
- to AND BACK 

Reductionism



Environment – Institution - Culture

- Newton's Particle State Based System
- Newton Circularity = Derivatives
→ Constant Force=Environement? Hell for Life !
- Production of Organization – Relational Econ.
- North / Williamson Institutional Econ = Prosa
- Pac Man: Wall Intelligence – Emergent Strategy
- Path Dependency – Coinduction / Bisimulation
- Chuck Norris couted to infinity – and back

Politics

- Information Revolution =
Representative Democracy Level
- Interest Groups
- Live Constitution of Constitutions
- Optimal Currency Area + Free Banking →
Central Banks for All ! Now !
- N. Stephenson: „National State“ Franchise System

Education

- Linguistics – Semantics – Model theory
Economists do it with Models ?
NO with Rubber Dolls
- Teach them to want a real wo/man
- GUI $\rightarrow$ Syntax Semantics Dynamics $\leftrightarrow$ Semiotics
- Logic, Category Theory, Biology, Cognition
Science, Philosophy
- NOT three times Microeconomics NO Macro
- „Economics is a Affront to my Intellect“



ARS ELECTRONICA FESTIVAL 2010

Catalogue (excerpt)

Ed. by H. Leopoldseder, C. Schöpf, G. Stocker
Ostfildern (Hatje Cantz) 2010

Prolog For a Future That Can be Experienced



Tobias Regensburger, Machine 1, 2000, div. materials
Photo: Helmut Kunde

Climate change, dependence on scarce resources, globalization and demographic developments are confronting humankind and our planet with new existential challenges. A paradigm shift seems long overdue. Sustainability and ethics are now key factors to ensure that a responsible society uses its resources wisely. How fit for the future is a society when it boils down to each individual acting solely on the basis of a realization of the necessity of giving up comfortable, customary ways in return for that which is new and uncertain? And what functional or even “functionalized” role does art play in this much-evoked call for transformation, a process that, if it’s even gotten started at all, has not made much progress to date? The affirmation of transdisciplinarity as one of the fundamental preconditions for visionary, future-oriented concepts lets us consider such changes not as acts

of art, of science and technology, or of the society and the economy alone, but rather as processes determined by reciprocal interaction. *overtures*, a series of projects conceived from its very inception as a long-term undertaking, was initiated in 2000 in response to these challenges. The aim is to work together with artists, designers, technologists, scientists, businesspeople and government officials to enable people to publicly experience current insights and issues through the use of social and performative interaction, workshops, expeditions, “sustainable” art services and paradigm shift training. This zone of substantive tension and interplay is the area being reconnoitered by artists Benjamin Bergmann, Finnbogi Pétursson and Kalle Laar and their work at the nexus of fiction, imagination and reality. They embody the yearning for the mental liberation of obsolete thinking and for experimentation on behalf of *The New*. At this year’s Ars Electronica Festival, *overtures* is collaborating with these three artists as well as the Design for Sustainability Department at the Delft University of Technology and the *Desire for Future* symposium to launch the Prolog to *ZeitRäume*, a research and development project on applying and experiencing the future, which will be staged as a project & discussion platform over the coming year at various locations.

<http://www.overtures.de/zeitraeume>
<http://www.pilotraum01.org>



Fitness fountains in Feijenoord, projectstudy by Bram van der Grinten, Delft University of Technology

Prolog für eine erfahrbare Zukunft

Der Klimawandel, die Abhängigkeit von limitierten Ressourcen, die Globalisierung und die demografische Entwicklung stellen die Menschheit und unseren Planeten vor neue existenzielle Aufgaben. Ein Paradigmenwechsel scheint längst überfällig. Nachhaltigkeit und Ethik werden Schlüsselfaktoren, um eine verantwortungsbewusste Gesellschaft mit einer vernünftigen Nutzung unserer Ressourcen zu gewährleisten. Wie zukunftstauglich ist aber eine Gesellschaft, wenn es darum geht, dass jeder Einzelne allein aus der Erkenntnis der Notwendigkeit bequem Gewohntes gegen die Ungewissheit des Neuen eintauschen soll? Und welche funktionierende oder auch „funktionalisierte“ Rolle spielt die Kunst in diesem allseits viel beschworenen Transformationsanspruch, der als Prozess bislang – wenn überhaupt – nur zögerlich in Gang kommt? Das Bekenntnis zur Transdisziplinarität als eine der grundlegenden Voraussetzungen für visionäre und zukunftsorientierte Konzepte lässt uns die Veränderungen nicht als einen Akt allein der Kunst, der Wissenschaft und Technik oder der Gesellschaft und Wirtschaft betrachten, sondern als einen von Wechselwirkungen bestimmten Prozess. Vor diesen Herausforderungen entstand die bereits im Jahr 2000 langfristig angelegte Projektreihe *overtures*, die in Zusammenarbeit mit Künstlern, Designern, Technologen, Wissenschaftlern sowie Vertretern aus Wirtschaft und Politik aktuelle Erkenntnisse und Fragestellungen mit gesellschaftlichen und performativen Interaktionen, Workshops, Expeditionen, aber auch mit „nachhaltigen“ Kunstdienstleistungen und Paradigmenwechseltrainings öffentlich „erfahrbar“ machen will. In diesem inhaltlichen Spannungsfeld bewegen sich die hier gezeigten Künstler Benjamin Bergmann, Finnbogi Pétursson und Kalle Laar mit ihren Arbeiten zwischen Fiktion, Imagination und Realität. Sie verkörpern die Sehnsucht nach der geistigen Befreiung überholten Denkens und nach dem Experiment für das Neue. Mit ihnen, dem Design for Sustainability Department der TU Delft sowie dem Symposium *Desire for Future*, startet *overtures* auf der diesjährigen Ars Electronica den Prolog zu *ZeitRäume*, einem Forschungs- und Entwicklungsprojekt zur Anwendung und Erfahrbarkeit von Zukunft, das sich im Laufe der kommenden Jahre an wechselnden Orten als Projekt- und Diskussionsplattform entwickeln wird.

Text: Serafine Lindemann, Christian Schoen

Stefan Döblin, Martin Richartz

Desire for Future

If “it is too late to be a pessimist” (Yann Arthus-Bertrand), then how can we generate optimism and appetite to devise a future worth living in, the kind of optimism that Alan Kay expresses in his statement: “The best way to predict the future is to invent it”? We are currently experiencing big failures, which are widely regarded as fatal, such as those in the environment (Mexican gulf), in our economy (financial crisis), and in international politics (middle east and central Asia). Globalization and population growth squeeze sustainability and ecological behavior. It is necessary to overcome the notion of failure as events that inevitably doom our societies to infirmity and decay. Therefore we set up a trans-disciplinary dialogue between science, technology, economy, and arts, to discuss and promote guidelines for designing our future:

- Perceive failure as a productive source of creativity: Design for the future and earn our living.
- Implement failure management, failure strategy, and establish failure as a challenge and use it in a dedicated process of change.
- Implement *diversity* as a guiding principle to achieve resilience in society, culture, and economy.
- Enable cognition by *transdisciplinary* teamwork in mutual reaction with interventions from art processes.
- Break open prevailing self-reference, corruption and lack of responsibility in economy, academia, and politics.

We need to mobilize ourselves and all other people to take responsibility free from fear for a brighter future. With this symposium we want to create a community multiplying and communicating and to implement examples of positive change actively in all kind of different ways.

For this symposium we gather a number of renowned experts from sociology, economics, philosophy, technical sciences, design, and artists with the curators in charge. We want to reflect and to experience jointly how to admit failure and generate the desire for change.

Wenn Yann Arthus-Bertrand mit seiner Feststellung „Es ist zu spät, um Pessimist zu sein“ recht hat, wie kann man dann Interesse für den Entwurf einer lebenswerten Zukunft wecken? Wie kann man Optimismus erzeugen – die Art von Optimismus, die Alan Kay meint, wenn er sagt: „Der beste Weg, die Zukunft vorherzusagen, ist, sie zu erfinden“? Wir erleben derzeit massive – großteils als fatal anzusehende – Misserfolge, etwa im Umweltbereich (Golf von Mexiko), in der Wirtschaft (Finanzkrise) und in der internationalen Politik (Naher Osten und Zentralasien). Globalisierung und Bevölkerungswachstum erschweren Nachhaltigkeit und umweltbewusstes Verhalten. Daher müssen wir die Vorstellung aufgeben, dass Misserfolge Ereignisse sind, die unsere Gesellschaft unvermeidlich zu Unsicherheit und Zerfall verdammen. In diesem Sinne rufen wir zu einem transdisziplinären Dialog zwischen Wissenschaft, Technik, Wirtschaft und Kunst auf, um Leitlinien für die Gestaltung unserer Zukunft zu diskutieren und zu forcieren. Ziel ist dabei,

- Misserfolge als produktive Quelle der Kreativität zu akzeptieren, d. h. Einsatz zukunftsweisender Entwicklungen zur Sicherung unseres Lebensunterhalts,
- Managementinstrumente und Strategien für den Umgang mit Misserfolgen zu implementieren, Misserfolge als Herausforderung zu erkennen und in einem engagierten Veränderungsprozess zu nutzen,

- *Diversität* als Leitprinzip festzulegen, um soziale, kulturelle und wirtschaftliche Krisenfestigkeit zu erreichen,
- durch *transdisziplinäres* Teamwork im Wechselspiel mit Interventionen aus Kunstprozessen Erkenntnisse zu ermöglichen,
- die vorherrschenden Selbstreferenzen, die Korruption und die Verantwortungslosigkeiten in Wirtschaft, Forschung und Politik aufzubrechen.

Wir müssen uns selbst und andere mobilisieren, um angstfrei Verantwortung für eine bessere Zukunft zu übernehmen. Mit diesem Symposium möchten wir eine kommunizierende Gemeinschaft begründen, die sich ständig vergrößert, und aktiv auf unterschiedlichste Weise Beispiele für positive Veränderung umsetzen.

Bei dieser Veranstaltung treffen eine Reihe renommierter Experten aus den Bereichen Soziologie, Philosophie, technische Wissenschaften, Design und Wirtschaft sowie Künstler mit den zuständigen Kuratoren zusammen. Dabei sollen die gemeinsame Reflexion und der Erfahrungsaustausch im Mittelpunkt stehen: Wie kann man Misserfolge eingestehen und den Wunsch nach Veränderung erzeugen?

Aus dem Englischen von Susanne Steinacher

This symposium of Münchner Kreis, Ludwig Maximilians University and Technical University Munich in cooperation with Ars Electronica is an event in the overtures – ZeitRäume series, organized by artcircolo and pilotraum 01. Further projects in the ZeitRäume series are planned for 2010 and 2011.



Julia Kissina
Postkasten für die Briefe
an die Zukunft
Holz, Farbe, Schloss

Finnbogi Pétursson

Earth

Since he first began exhibiting in the 1980s, the Icelandic artist Finnbogi Pétursson has created a varied body of work that revolves around the relationship between sound, the visual image, sculpture and architecture. Artistic creativity and an avid interest in scientific research and cultural history together form the starting point for his conceptual work. The impetus for his installations comes from his musical background, technical skills and passion for playful experimentation whilst his minimalistic approach lends them their precise form. His work is free from superfluous decorative clutter. It concentrates on what is essential but it also has a poetic quality. New and different ways of seeing the world are thus opened up for the viewer. Pétursson became internationally acclaimed for the installation with which he represented his country at the Biennale in Venice in 2001. For *Diabolus*, he transformed the entire Alvar Aalto Pavilion into a resonance space. The work can be entered by means of a tunnel that tapers at one end to contain an organ pipe and a “low frequency speaker” that emit tones at a varying frequency. The interference wave created by the reverberating tones, measuring 17 hz, was condemned in medieval times as the music of the devil. For the installation *Earth*, Pétursson creates an interference wave measuring 7.8hz in a pool of water. The tone, which can be heard and physically detected, is visible on the surface of the water in the form of waves. A megahertz of 7.8 corresponds to the physical phenomenon known as the Schumann Resonance, which is the frequency of the Earth's electromagnetic fields. For Pétursson, this frequency represents the primal pulse of our Planet.

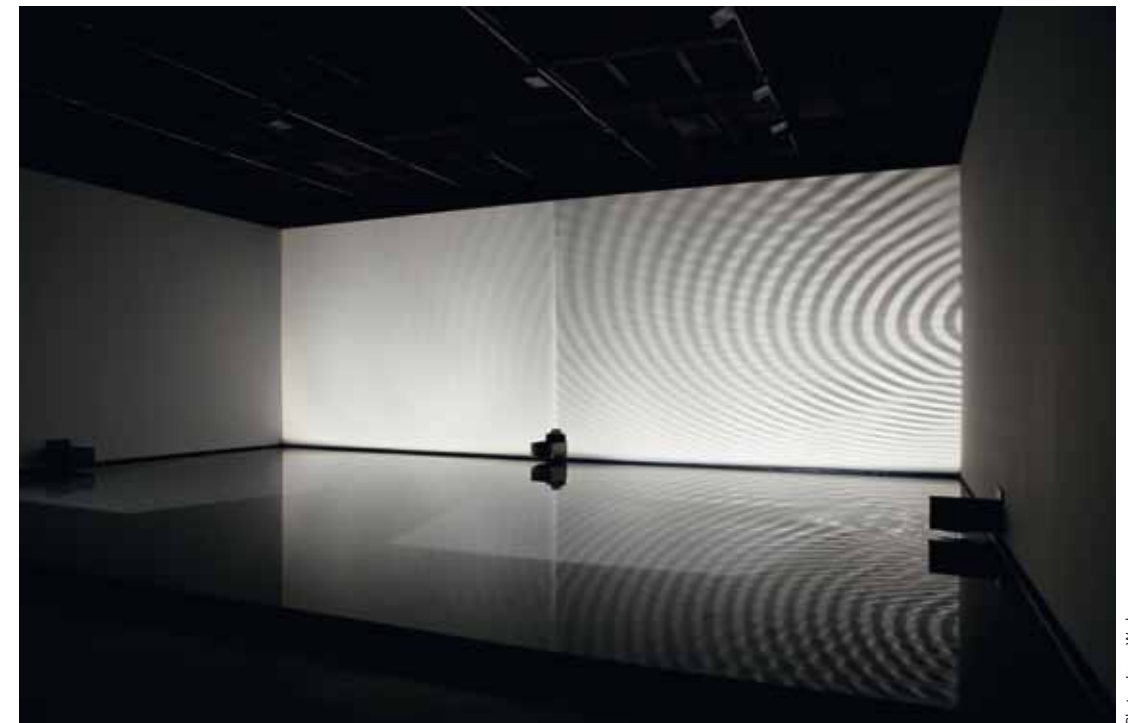
Translated from German by Claire Springer

Seit dem Beginn seiner Ausstellungstätigkeit in den 1980er Jahren hat der isländische Künstler Finnbogi Pétursson ein vielseitiges Werk geschaffen, das um die Verbindung von Sound, Optik, Skulptur und Architektur kreist. Eine Mischung aus naturwissenschaftlichem Forscherdrang, kulturhistorischer Recherche und künstlerischer Kreativität ist Ausgangspunkt seiner konzeptuellen Arbeiten. Sein musikalischer Hintergrund, die technischen Fähigkeiten und der spielerische Drang zum Experimentieren sind der Motor, das minimalistische Vorgehen gibt seinem Schaffen die präzise Form. Sein Werk ist frei von überflüssigem Dekor. Es konzentriert sich auf das Wesentliche und ist dennoch poetisch. So öffnen sich dem Betrachter neue Möglichkeiten einer anderen Sicht auf die Welt. International bekannt wurde Pétursson durch seine Installation, mit der er sein Heimatland 2001 auf der Biennale in Venedig vertrat: Für *Diabolus* hat er den gesamten Pavillon Alvar Aaltos in einen Resonanzraum verwandelt. Begehrbar ist die Arbeit durch einen sich verjüngenden Tunnel, an dessen Ende eine Orgelpfeife und ein „low frequency loudspeaker“ Töne in jeweils unterschiedlicher Frequenz erzeugen. Die hierdurch entstehende Interferenz von 17 Hz wurde in der mittelalterlichen Musik als Ton des Teufels verdammt. Für *Earth* erzeugt Pétursson in einem mit Wasser gefüllten Bassin eine Interferenz von 7,8 Hz. Der Ton, hör- und spürbar, wird durch Wellen auf der Wasseroberfläche sichtbar. Die 7,8 Hz entsprechen dem physikalischen Phänomen, das als Schumann-Resonanz bezeichnet wird. Es beschreibt die Schwingung des elektromagnetischen Feldes der Erde. Für Pétursson ist diese Frequenz der Herzschlag unseres Heimatplaneten.

Text: Christian Schoen

<http://www.finnbogi.com>

Courtesy of the artist and i8 gallery, Reykjavik



Earth (installation view from Sean Kelly Gallery, New York)

Photos: Jason Wyché

Benjamin Bergmann

Never Ever

The works of Benjamin Bergmann are bold statements, conceptual experiments and sophisticated intellectual games frequently permeated by a sense of the absurd. His creations often have the dimensions of a stage set; they are imbued with a sense of sculpture and come alive through their performative character. "For me, the beauty of absurdity is the sustainability of confusion. Eventually one finds oneself thinking that perhaps it would be much nicer if the world were totally absurd." (Benjamin Bergmann)

By mounting a basketball hoop at a vertiginous height, Bergmann is setting up a real and metaphorical experiment with an unattainable goal where failure is more likely than success. His installations and sculptures derive from reality and in their irrationality, fallibility and inherent hubris reflect man in his striving to test his own limits. Bergmann develops the dialogue that emerges between his work and the public, a confrontation perceived at the level of physical experience, into a playful experiment in which the detection and repetition of error, and repeated failure, are intentionally set up. The Artist, his work and the viewer tread the same path together until the point at which art claims supremacy; fears, emotions and the search for meaning can no longer be expressed verbally and the image acquires an irreplaceable dimension.

Translated from German by Claire Springer

Die Werke Benjamin Bergmanns sind kühne Behauptungen, gedankliche Experimente und sensible Gedankenspiele, in denen nicht selten das Absurde in den Vordergrund rückt. Seine Arbeiten erreichen oft bühnenhafte Dimension, sie sind geprägt von skulpturalem Grundverständnis und leben von ihrem performativem Charakter. „Das Schöne an der Absurdität ist für mich die Nachhaltigkeit der Verwirrung. Irgendwann ertappt man sich bei dem Gedanken, dass eine gänzlich absurde Welt vielleicht viel schöner wäre.“ (Benjamin Bergmann)

Wenn Bergmann also in schwindelerregender Höhe einen Basketballkorb installiert, dann schafft er ein faktisches und metaphorisches Experiment mit hochgestecktem Ziel, bei dem das Scheitern wahrscheinlicher ist als der Erfolg. Seine Installationen und Skulpturen leiten sich von der Wirklichkeit ab und spiegeln in ihrer Irrationalität, Fehlerhaftigkeit und der ihnen innewohnenden Hybris das menschliche Streben nach dem Austesten der eigenen Grenzen. Der zwischen Werk und Publikum entstehende Dialog, in Form einer physisch erfahrbaren Gegenüberstellung, wird von Bergmann als spielerisches Experiment entwickelt, in dem Fehlerermittlung, Fehlerwiederholung und wiederholtes Scheitern Programm sind. Gemeinsam beschreiten Künstler, Werk und Betrachter einen Weg bis zu jenem Punkt, an dem die Kunst ihr eigenes Recht fordert; dann lassen Ängste, Gefühle und Sinnfragen sich nicht mehr in Worte fassen, und das Bild wird zur unersetzlichen Größe.

Text: Christian Schoen

<http://www.benjaminbergmann.de>



Basketballkorb montiert
an Kraftwerksfassade
Tabakfabrik, Linz



Kalle Laar

wherever you go I'll be already there. small sounds

Pictures—movies or stills—are spatially removed representations of our reality. Before they touch us, this distance has to be overcome. Sounds are restrained by no such impediments; they reach our brain and (sub)consciousness directly. This is a hardly measurable but nevertheless essential difference. Sound artist Kalle Laar investigates the ambient noises that surround us and that we consciously or unconsciously perceive. His "research work" focuses on the individual emotional connections evoked by sounds—and unaffected by visual elements. His objective is to activate this perspective and to link it to social, political and scientific aspects. In *wherever you go I'll be already there. small sounds*, a seemingly empty room is occupied by sounds, tone by tone. These sounds are often on the very threshold of audibility, so that the visitor doesn't always know whether he/she actually heard something and, if so, what and where. The acoustic nature of the installation space positively compels the visitor to perceive even the slightest sound, while the visual impression permits any and all associations. This is why every sound initially comes across as utterly out of place, distracting, surprising, and even amusing. Nature intrudes; there are techno-sounds and the noise of everyday life. In relation to the installation space's dimensions, they remain in miniature format, little tonal objects to be discovered, audible phenomena that, in their own way, surreptitiously take possession of this place.

Symphony for broken speakers

Symphony for broken speakers is to be understood in the context of "REPAIR," the theme of this year's Ars Electronica Festival. The way Kalle Laar sees it, kaput technology has the right to live on in dignity. Instead of disposing of his loudspeakers—that can no longer meet the standards demanded by a sound artist—they become members of his ensemble, contributing their own inimitable qualities to the interpretation of "defective" classic and electronic sounds.

Kalle Laar

wherever you go I'll be already there. kleine klänge

Bilder, bewegt oder unbewegt, sind räumlich entfernte Repräsentanten unserer Wirklichkeit. Bevor sie uns berühren können, muss diese Distanz überwunden werden. Der Klang kennt diese Grenzen nicht und erreicht Gehirn und (Unter-)Bewusstsein unmittelbar, ein kaum messbarer, doch essenzieller Unterschied. Soundkünstler Kalle Laar untersucht Geräusche, die uns umgeben und die wir bewusst oder unbewusst wahrnehmen. Im Vordergrund seiner „Forschungsarbeit“ steht die durch Klänge hervorgerufene individuelle emotionale Verbindung, unbeeinträchtigt von visuellen Elementen. Diese Perspektive zu aktivieren und mit sozialen, politischen und wissenschaftlichen Aspekten zu verknüpfen, ist sein Ziel. In *wherever you go I'll be already there. kleine klänge* wird ein scheinbar leerer Raum Ton für Ton von Klängen erobert. Oft am Rand der Hörschwelle angesiedelt, weiß der Besucher nicht immer, ob er tatsächlich etwas vernommen hat – und wenn ja, was und wo? Die akustische Natur des Installationsraumes zwingt dazu, auch das kleinste Geräusch wahrzunehmen, während der visuelle Eindruck jede Assoziation offen lässt. Daher wirkt jeder Klang zunächst deplatziert, irritierend, überraschend, auch amüsant. Natur dringt ein, technoide und Alltagsgeräusche. Im Verhältnis zu den Raumdimensionen bleiben sie in Miniaturform, kleine Klangdinge zum Entdecken, die den Ort auf ihre Art heimlich in Besitz nehmen.

Symphony for broken speakers. Eine Komposition für defekte Lautsprecher

Symphony for broken speakers trägt das Motto des diesjährigen Festival Ars Electronica „REPAIR“, denn bei Kalle Laar darf kaputte Technik in Würde weiterleben. Statt seine Lautsprecher, die für ihn als Klangkünstler nicht mehr tauglich sind, zu entsorgen, werden sie zu Ensemble-Mitgliedern, die ihre Eigenart in die Interpretation „defekter“, klassischer und elektro-nischer Klänge einbringen.

Text: Serafine Lindemann

<http://www.overtures.de/zeitraeume>



djkl & The Temporary Soundmuseum

No more duck and cover. Survive with the sound museum defective, sick, obsolete, irreparable, remarkable, lost, off-the-charts and misplaced sounds; on vinyl, of course; saved by the dj. From the collection of the Temporary Soundmuseum www.vinylculture.org



No more duck and cover. Überleben mit dem Soundmuseum defekte, kranke, überholte, kaputte, merkwürdige, verlorene, abseitige und abhandengekommene Klänge, natürlich auf Vinyl, saved by the DJ. Aus der Sammlung des Temporary Soundmuseum www.vinylculture.org



quelle 01

Do we need to redefine our views about the value of water? Are some of our views worth holding on to? Do others need revisiting? What changes need to be made in view of resource limitations, climate change and globalization? How much latitude do new ideas and visions for change enjoy in today's economy? And how much personal responsibility do we take for our actions, at a local and international level?

Access to healthy drinking water is a basic right, but it also poses technological and societal challenges. Experts from the fields of technology, biology, medicine, art and design came together to undertake a joint examination of issues around water consumption. The water re-treatment company, *quelle 01* (design by Peter Trautwein), was developed in order to ensure optimal water quality and to maximize the utilization of local sources, thereby reducing the need for unnecessary transportation and bottle cleaning and recycling, and also to ensure that preventative health measures are applied. *quelle 01* provides local tap water which has undergone physico-chemical preparation as nature intended. The centerpiece of the production plant, which is equipped with high quality technology, natural materials and filter systems, is the water vortex generator, which mimics naturally occurring water regeneration processes. *quelle 01* – a future-oriented fusion of technology, nature and life – also stands for the theme of this year's Ars Electronica Festival: REPAIR!

Translated from German by Claire Springer

Welche Werte im Hinblick auf Wasser sind neu zu definieren, zu bewahren oder wieder-zuentdecken? Welcher Veränderungsbedarf besteht aufgrund von Ressourcenlimitationen, Klimaproblematiken und Globalisierung? Welche Freiräume werden neuen Ideen und Transformationen in der heutigen Wirtschaft eingeräumt? Und welche persönliche Verantwortung übernehmen wir für unser Handeln, auf lokaler und internationaler Ebene?

Die Versorgung mit gesundem Trinkwasser ist ein Grundrecht, aber auch eine technische und gesellschaftliche Herausforderung. Experten aus Technologie, Biologie, Medizin, Kunst und Design schlossen sich mit dem Anspruch zusammen, dem täglichen Verbrauch von Wasser gerecht zu werden. Unter der Vorgabe, eine optimale Trinkwasserqualität zu erzielen, weltweit die lokalen Quellen zu nutzen und damit unnötige Transporte, Reinigung und Recycling von Flaschen zu vermeiden, aber auch Präventionsmaßnahmen für unsere Gesundheit zu ergreifen, wurde der Trinkwassernachbereiter *quelle 01* entwickelt (Design: Peter Trautwein). *quelle 01* spendet lokales Leitungswasser nach physikalischer und chemischer Aufbereitung, wie wir es von der Natur gewohnt sind. Herzstück des mit hochwertiger Technik, natürlichen Materialien und Filtersystemen ausgestatteten Gerätes ist der Wasserverwirbler, der natürliche Wasserregenerierungsprozesse nachahmt. *quelle 01* – ein zukunftsorientierter Zusammenklang von Technik, Natur und Leben – steht somit auch für das Motto des diesjährigen Ars Electronica Festivals: REPAIR!

Text: Serafine Lindemann

<http://www.quellsysteme.de>



ARS ELECTRONICA FESTIVAL 2010



[HOME](#)



ARS ELECTRONICA FESTIVAL 2010

90.227 BesucherInnen sahen das größte Ars Electronica Festival seit 1979

„Eine wirklich **unglaubliche Resonanz**, die in dieser Dimension nicht vorhersehbar war“, freut sich Gerfried Stocker, künstlerischer Geschäftsführer der Ars Electronica: „Denn auch wenn wir damit gerechnet haben, dass uns das erstmalige Öffnen der Tabakfabrik zusätzliches Publikum erschließt, übertrifft dieses Ergebnis alles, was wir uns im Vorfeld gewünscht bzw. erhofft haben.“ Ein **wesentlicher Faktor für das Gelingen** der Ars Electronica 2010 war die **breite Zusammenarbeit der nationalen und internationalen Kunst- und Kulturszene..**



ARS ELECTRONICA FESTIVAL 2010

307 Veranstaltungen auf fast 80.000 m²

2010 umfasste das Festivalprogramm so viele Angebote wie nie zuvor – mit der Tabakfabrik wurde zudem die größte und weitläufigste Location in der Geschichte des Festivals bespielt. 105 InfotrainerInnen informierten die BesucherInnen hier über die auf dem gesamten Areal verteilten Ausstellungen sowie über die Geschichte der Linzer Tabakfabrik. Insgesamt wirkten rund 1.100 Personen am wohl größten Ars Electronica Festival seit 1979 mit. Allein die Leistung der 30 TechnikerInnen kann sich sehen lassen: In rund 3000 Arbeitsstunden wurden 5 Kilometer Strom- und 4 Kilometer Netzkabel verlegt, 180 Computersysteme und Monitore, 50 Projektoren und 25 Flachbildschirme installiert und mittels 25 wlan-Routern ein flächendeckender Internetzugang auf dem Werksareal gewährleistet. Allein in den vergangenen Tagen wurde über den ebenfalls installierten 200 mbps Internetzugang eine Datenmenge von 1,1 Terrabyte übertragen.

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