# Technology Transfer

Samspillet mellem teknologi og samfund

Lars Bo Andersen

# Hvad er Technology Transfer?

- Til tider synonym med **diffusion**
  - TT ~ planlagt/makro
  - Diffusion ~ systemisk/meso-mikro

Technology transfer—the **process** and **consequences** of **moving technological** ideas, skills, processes, hardware, and systems **across a variety of boundaries**—national, geographic, social and cultural, or organizational and institutional...
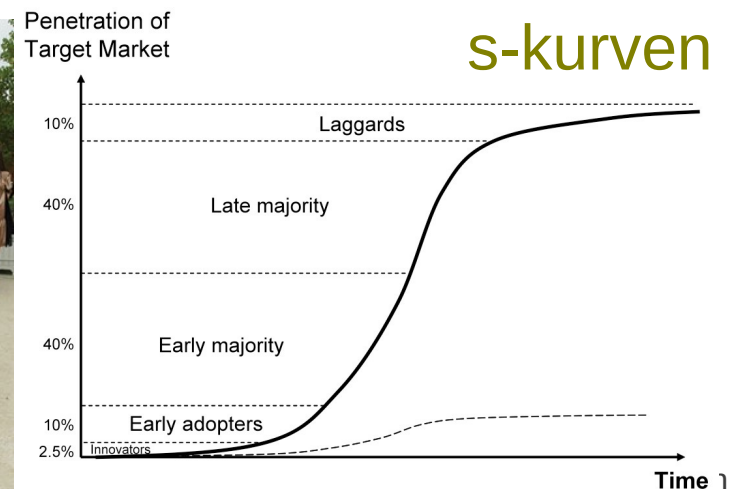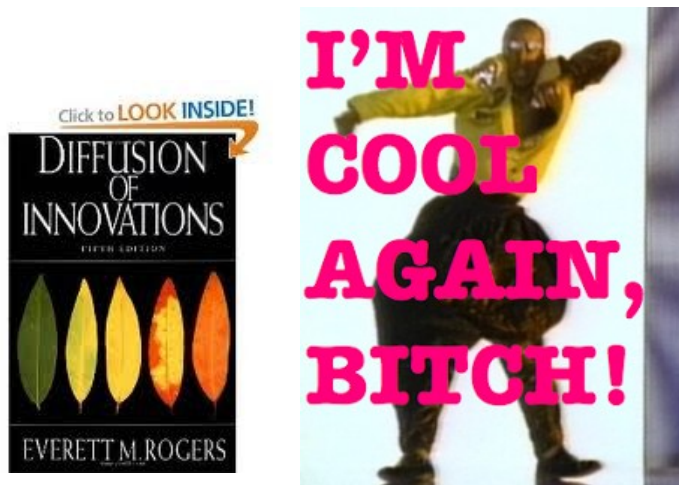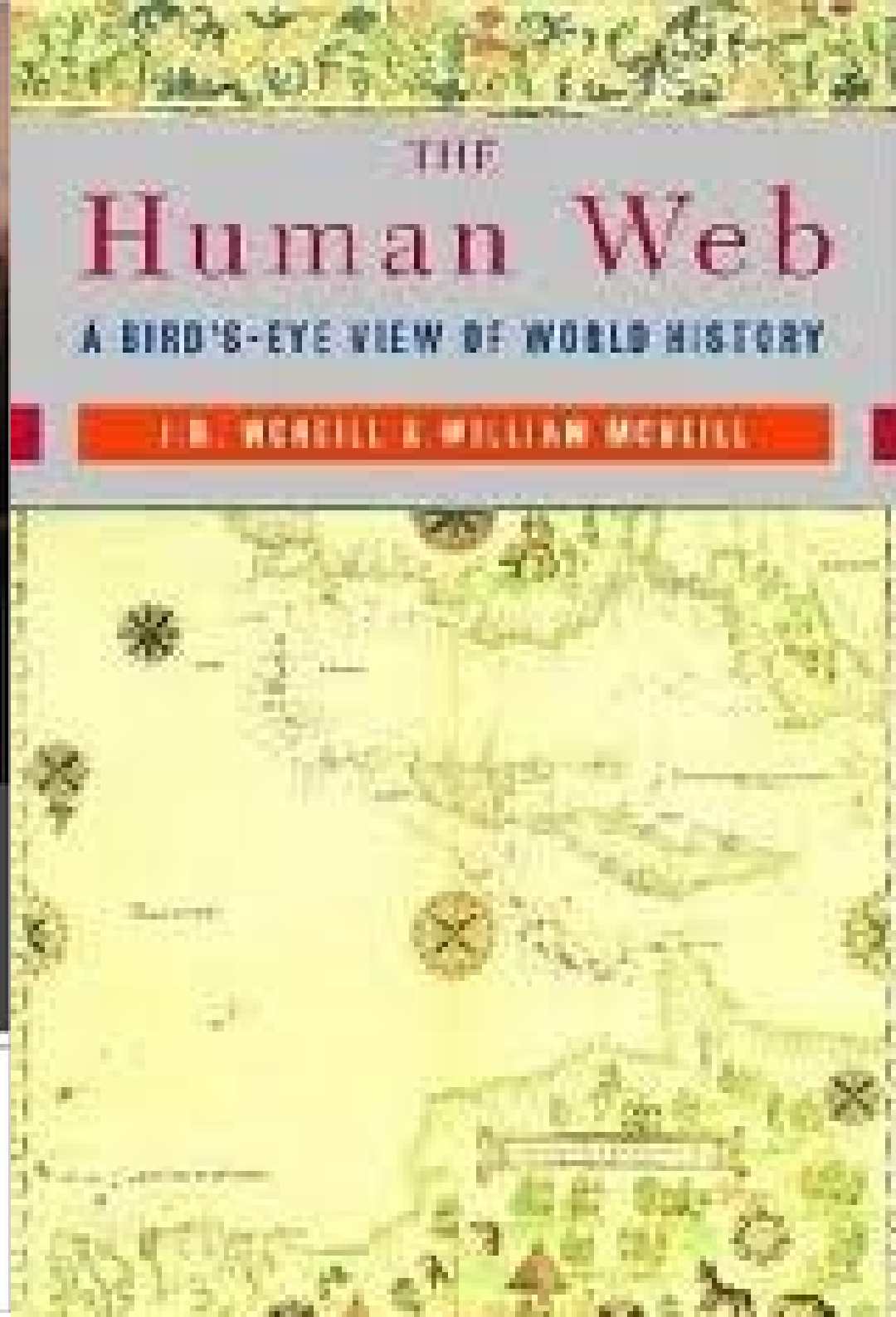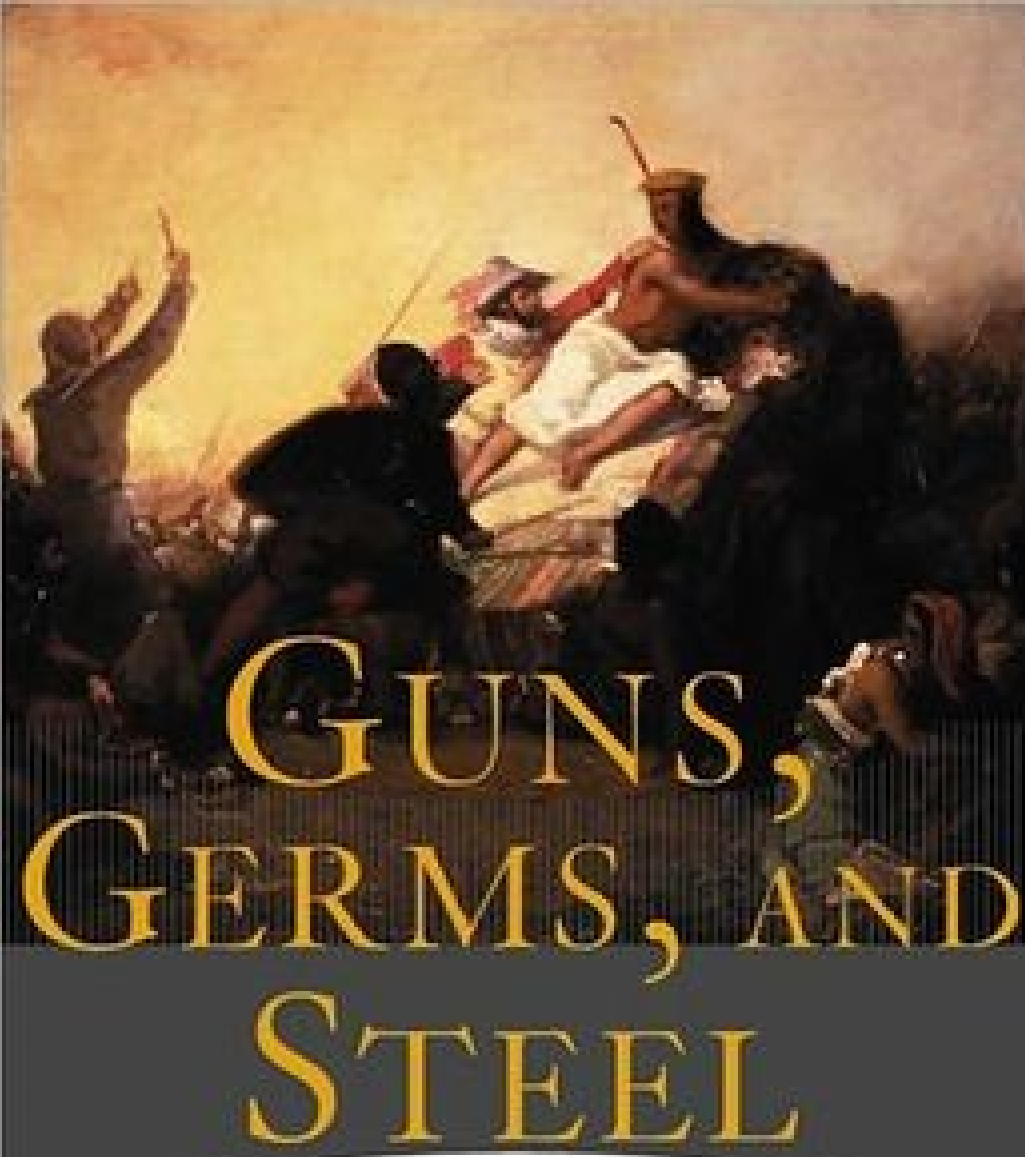
(Seely, s. 8)

Few expressions represent so **many different meanings** to so many different people as the often-used phrase 'technology transfer'

(Manning in Seely, s. 8)

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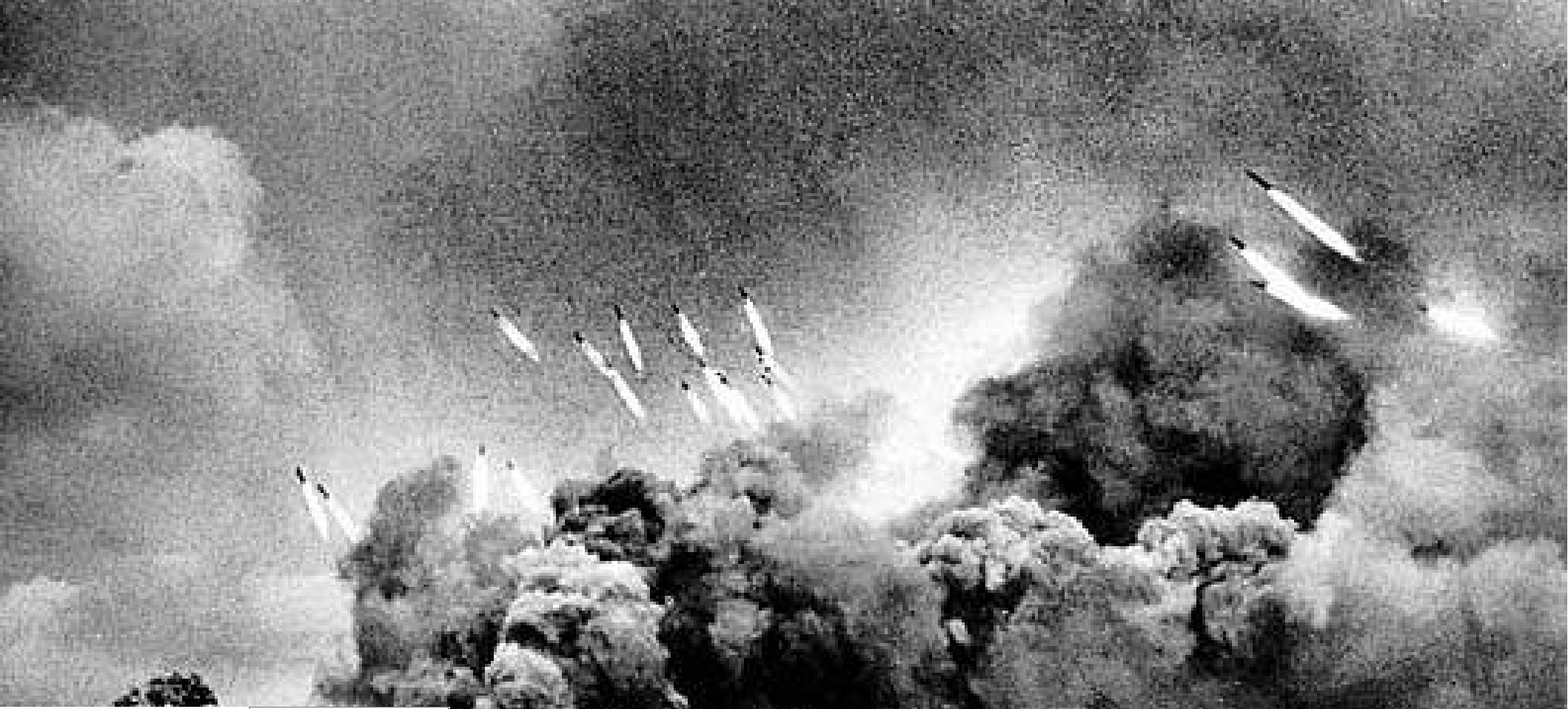
# Hvad er Technology Transfer?

- Everett Rogers - Diffusion of Innovations

  – Skift i fokus fra teknologi til proces (kommunikation)

  – Innovators, early adopters, laggards, opinion leaders, change agents

- ANT begrebet **translation** bruger transfer/diffusion som stråmand

- Vi studerer ofte hvordan teknologi bevæger sig / bliver udbredt



s-kurven

# GUNS, GERMS, AND STEEL

## The Fates of Human Societies

### JARED DIAMOND

AUTHOR OF *THE THIRD CHIMPANZEE*

# THE Human Web

## A BIRD'S-EYE VIEW OF WORLD HISTORY

### J. R. McNEILL & WILLIAM McNEILL

Colonialism (1914)

Land Occupation
- Belgium
- France
- Germany
- Great Britian
- Italy
- Portugal
- Spain
- Independent

**[W]e** must embark on a bold new program for making the benefits of our scientific advances and industrial progress available for the improvement and growth of **underdeveloped** areas …

Their food is inadequate. They are victims of disease. Their economic life is primitive and stagnant. Their poverty is a handicap and a threat both to them and to more prosperous areas. **For the first time in history**, humanity possesses the knowledge and the skill to relieve the suffering of these people
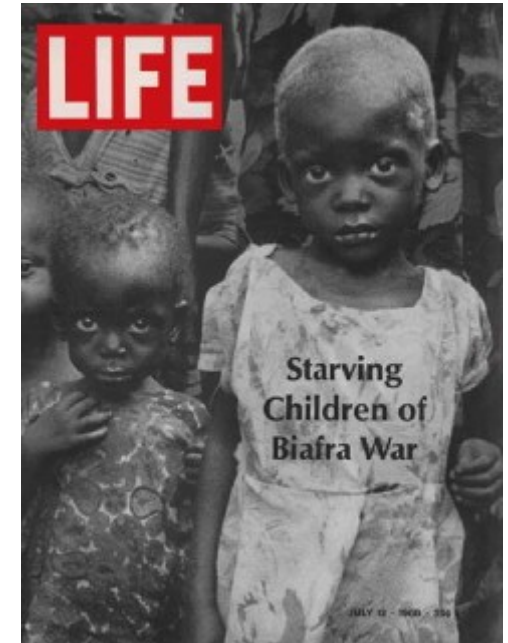
(Truman, 1949)

# Marshall planen



Two years after the war Stuttgart's inner city still reflected the destruction of urban centers during wartime bombing. | 1947 1955 | Marshall Plan funds helped provide for the rebuilding of cities. Photos on these two pages were taken from the same spot.



LIFE

Starving Children of Biafra War



"the most massive technology transfer in history" (Seely: 11)

# The Development Decade

- UN udråber 1960'erne til Development Decade

  – Formål: "A redirection of science and technology to attack the problems of developing countries" (Jolly et al., 2004, p. 89)

It didn't occur to us in the beginning of the 1960s, that any of us should reach the other side of Silver Jubilee working in Danish development. We really thought that the development decade […] would bring **so many transfers and spark so many initiatives that growth would follow and extreme poverty would be eradicated**.

(Christian Kelm-Hansen quoted in Villadsen & Heldgaard, 2012 - my translation)

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# Udvikling

- **Udfordringen** (som formuleret i 1960erne): A growing gap in
  - economic capacity / poverty
  - science and technology
- **Løsning**: Redirecting techno-science - bridging the gap with technology transfer
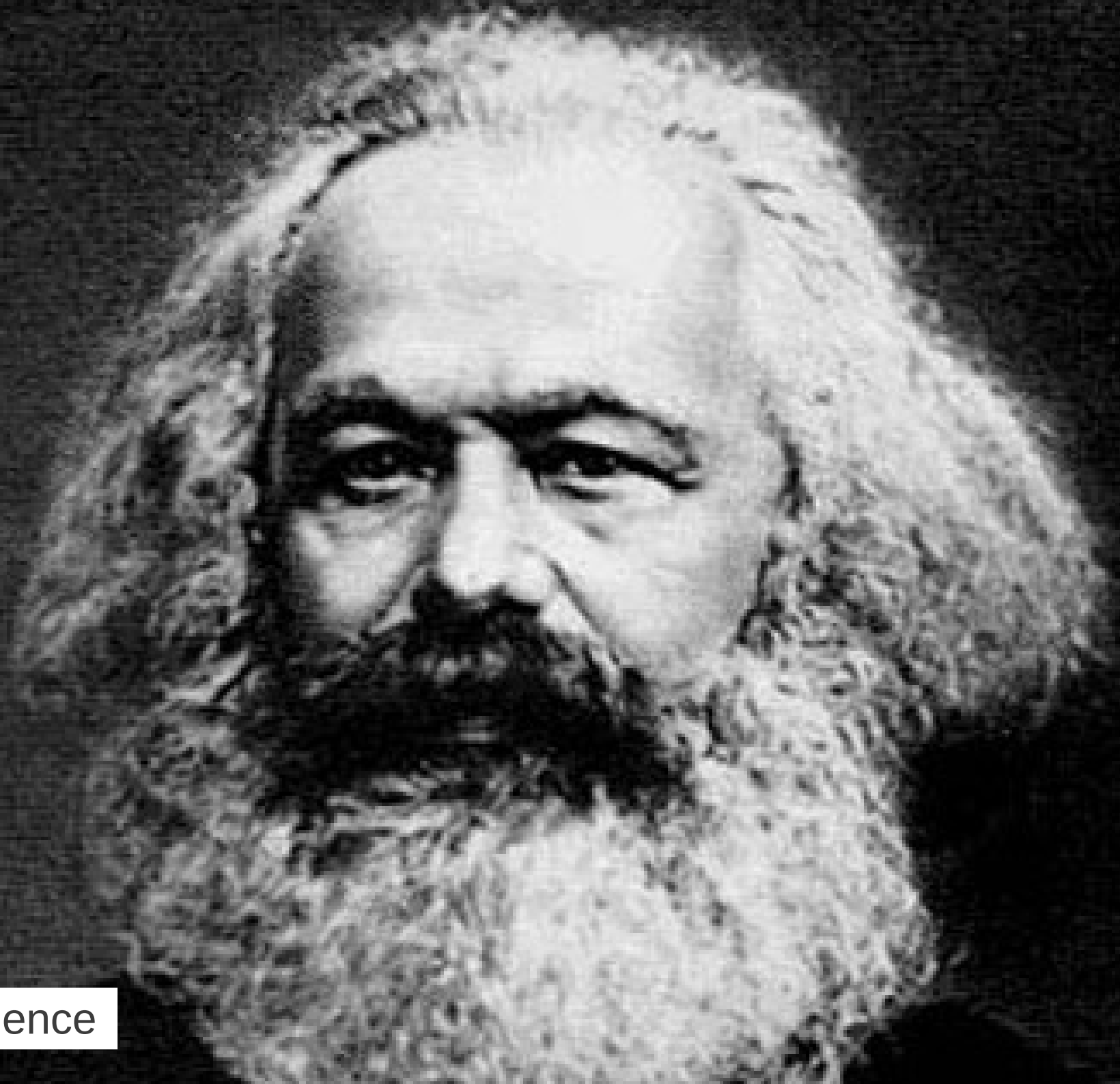  - Teknologi som drivkraft for udvikling og fremskridt

The common feature of assistance from foundations, the United Nations, World Bank, the United States, or Soviet governments was the automatic assumption that **economic development required the transfer of advanced Western technology**—hardware, industrial processes, knowledge, and skills.

# Strømninger gennem TT

- Convergence // Modernisation

  – Vi ender det samme sted

  – Link til oplæg om **determinisme** og **modernitet**

- Dependency // Centre-Periphery

  – Dynamiske netværksstrukturer skaber ulighed

- Empowerment

  – Oplæg om **skoler, uddannelse og kritisk tænkning**

Temaer vi kan relatere til i vores analyser

Convergence
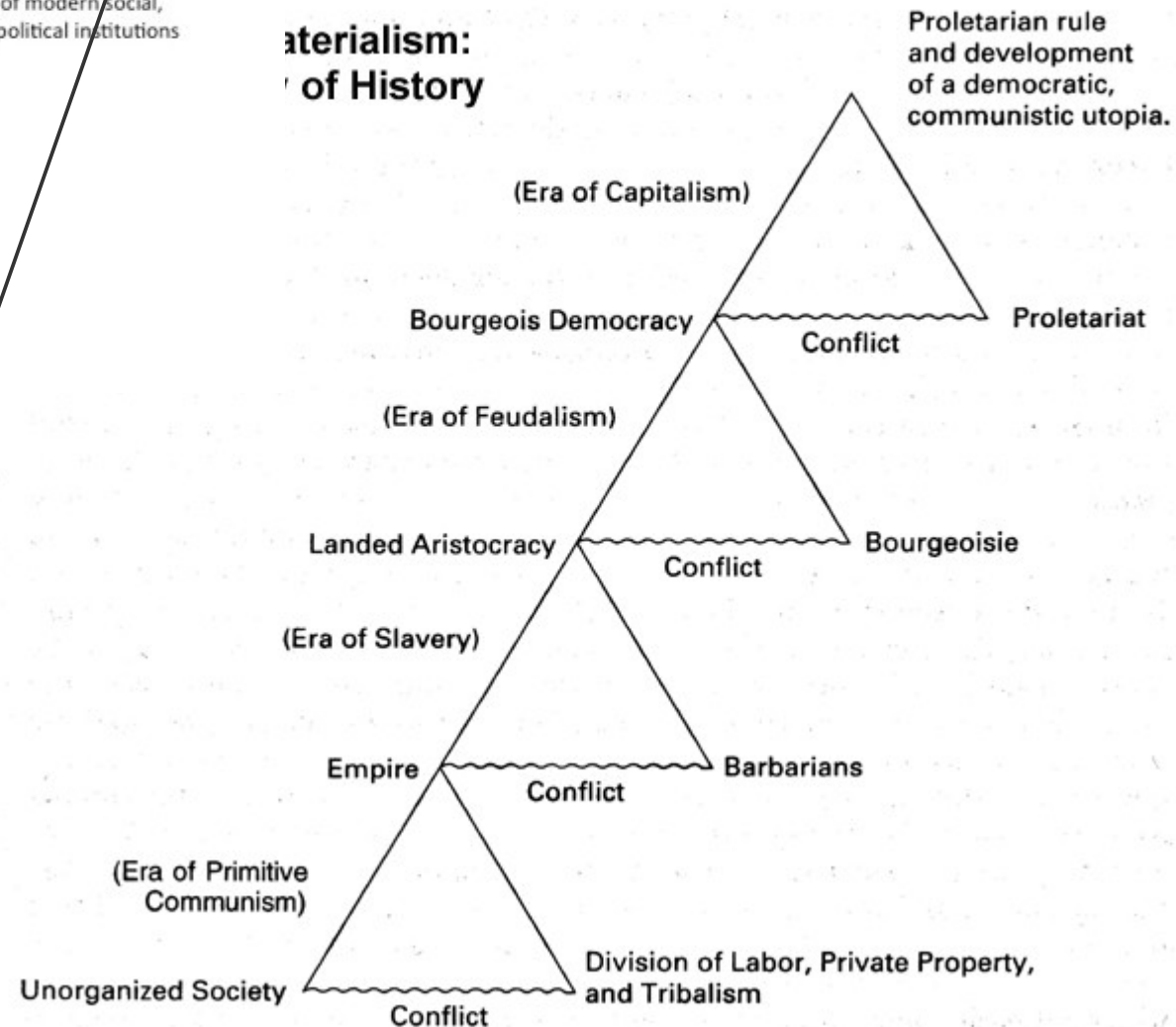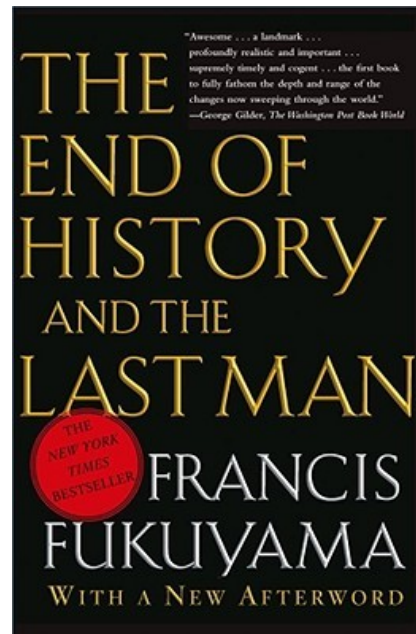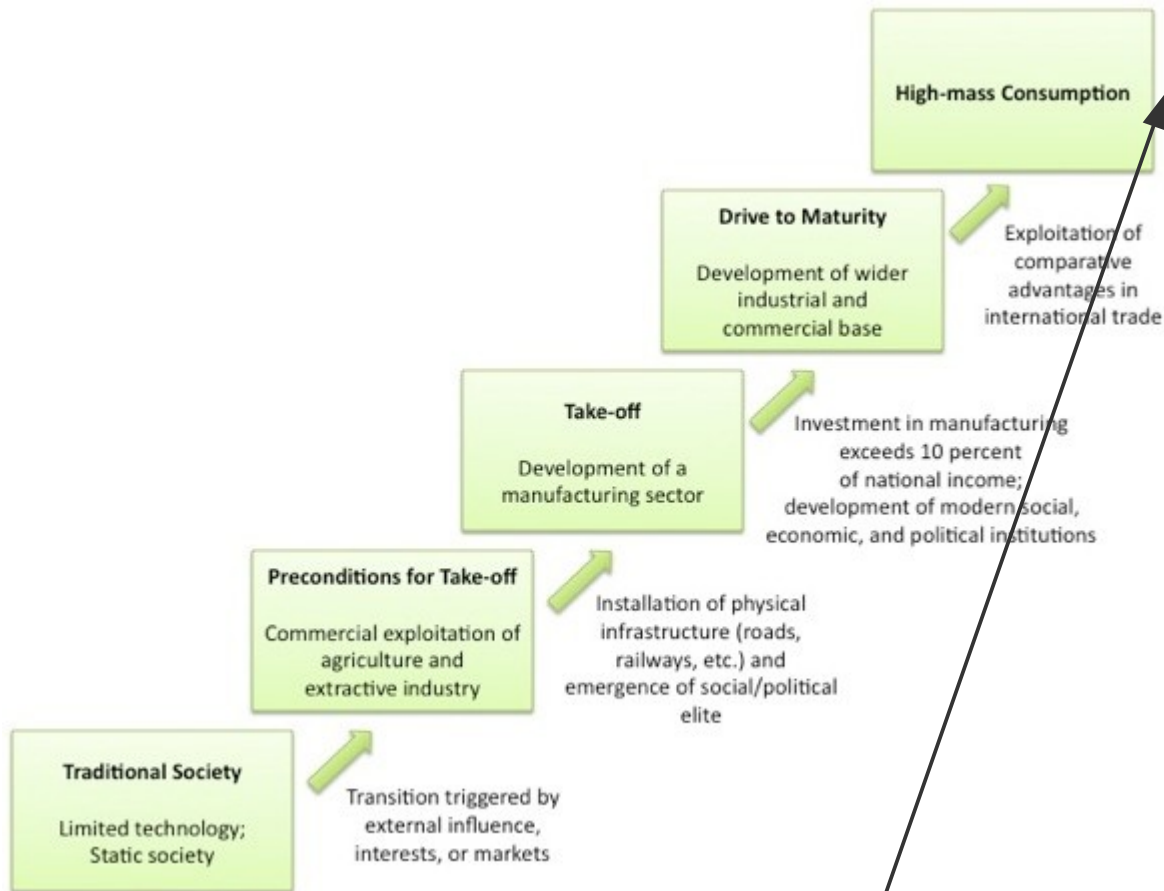
# W. W. ROSTOW

# The stages of economic growth

## A non-communist manifesto

Third edition

**(Neo-)liberal demokrati**

High-mass Consumption

Drive to Maturity

Development of wider industrial and commercial base

Exploitation of comparative advantages in international trade

Take-off

Development of a manufacturing sector

Investment in manufacturing exceeds 10 percent of national income; development of modern social, economic, and political institutions

Preconditions for Take-off

Commercial exploitation of agriculture and extractive industry

Installation of physical infrastructure (roads, railways, etc.) and emergence of social/political elite

Traditional Society

Limited technology; Static society

Transition triggered by external influence, interests, or markets

"Awesome . . . a landmark . . . profoundly realistic and important . . . supremely timely and cogent . . . the first book to fully fathom the depth and range of the changes now sweeping through the world."
—George Gilder, *The Washington Post Book World*

THE END OF HISTORY AND THE LAST MAN

THE NEW YORK TIMES BESTSELLER

FRANCIS FUKUYAMA

WITH A NEW AFTERWORD

aterialism: of History

Proletarian rule and development of a democratic, communistic utopia.

(Era of Capitalism)

Bourgeois Democracy — Conflict — Proletariat

(Era of Feudalism)

Landed Aristocracy — Conflict — Bourgeoisie

(Era of Slavery)

Empire — Conflict — Barbarians

(Era of Primitive Communism)

Unorganized Society — Conflict — Division of Labor, Private Property, and Tribalism

# Convergence // Modernisation

- Både vesten og USSR koblede teknologi med **<u>historisk</u>** fremskridt

  – Convergence: Udvikling(en) leder samme sted hen

  – Modernisation: Overførsel af teknologi + indførsel af reformer for at komme til næste "trin"
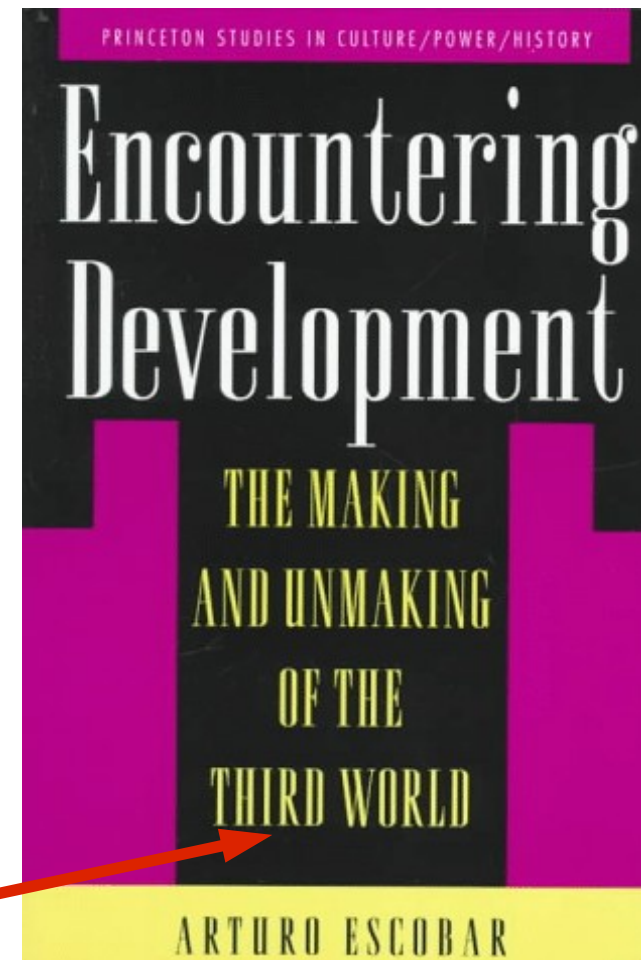
During the take-off new industries expand rapidly, yielding profits a large proportion of which are reinvested in new plants, and these new industries, in turn, stimulate, through their rapidly expanding requirement for factory workers, the services to support them, and for other manufactured goods, a further expansion in urban areas and in other modern industrial plants.     (Rostow, 1990, p. 8)
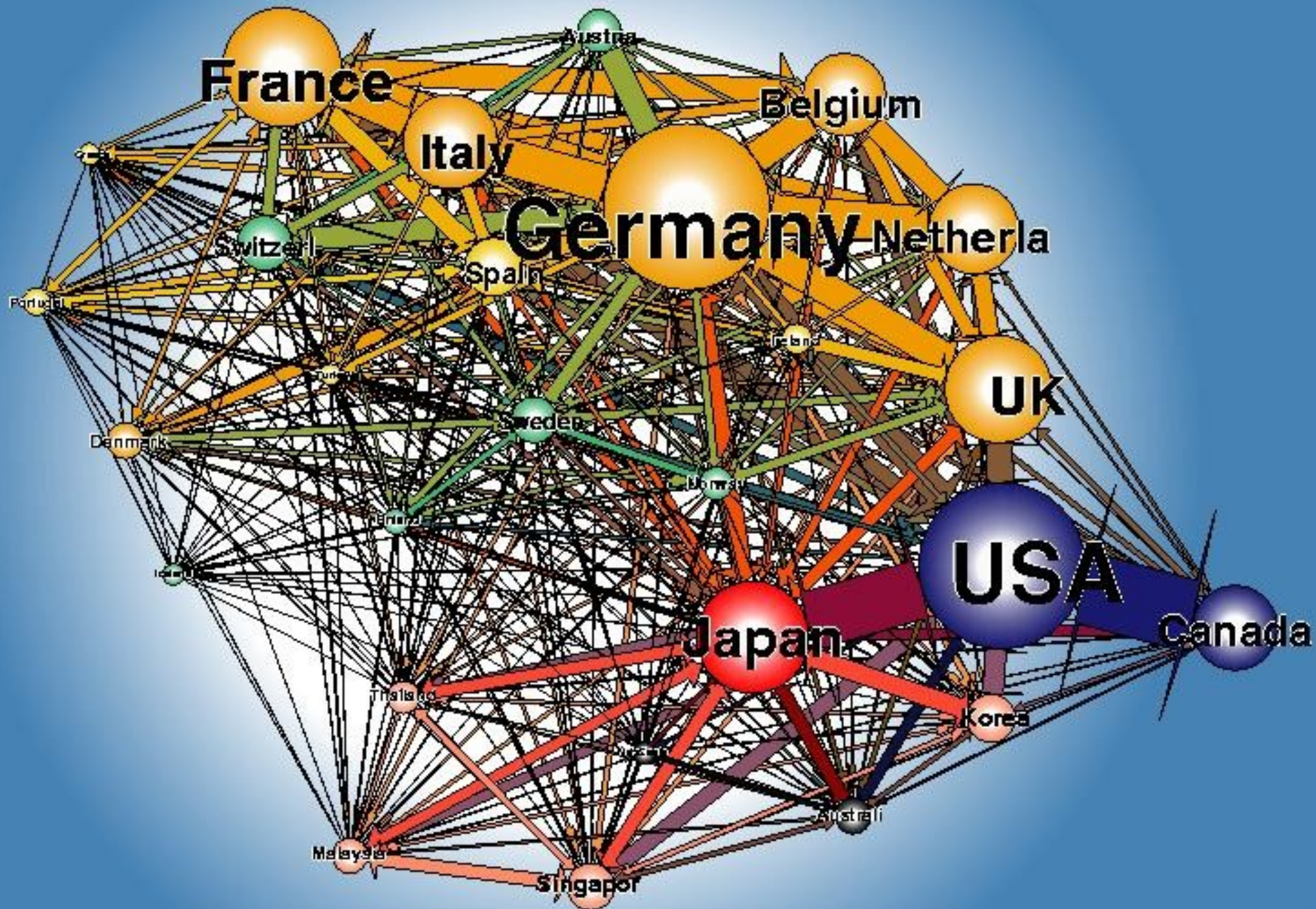
# Convergence // Modernisation

- Modernisation theory er sidenhen blevet stærkt kritiseret – især for dets teknologisyn

Technology, it was believed, would not only amplify material progress, it would also confer upon it a sense of direction and significance. In the vast literature on the sociology of modernization, **technology was theorized as a sort of moral force that would operate by creating an ethics of innovation, yield, and result**.

(Escobar, 1995, p. 36)

PRINCETON STUDIES IN CULTURE/POWER/HISTORY

Encountering Development

THE MAKING AND UNMAKING OF THE THIRD WORLD

ARTURO ESCOBAR

Lars Bo Andersen

Network capitalism (Core-Periphery)

# Dependency // Centre-Periphery

- Kritik af modernisation og convergence

  – Ofte marxistisk kritik af imperialisme

  – Technology transfer er indvævet i **afhængighedsforhold**

- Udnyttelse forskydes rundt i dynamiske netværk

Skrevet i 1970erne – informations kapitalisme

...a system of imperialism mediated by instant communication connecting different centres through links that "form and dissolve in rapid succession, changing scope and domain, highly adjustable to external circumstance"
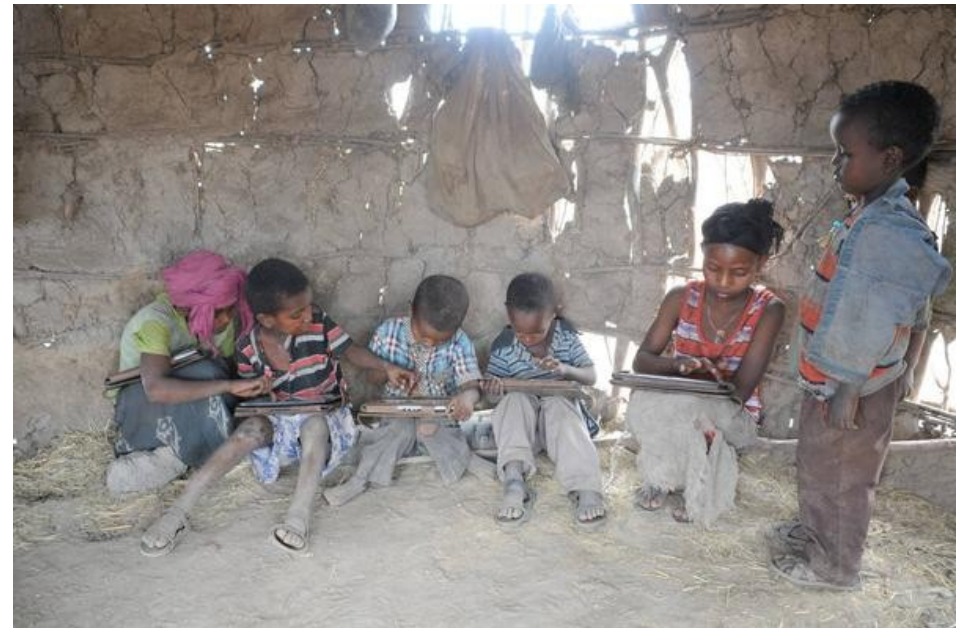
(Galtung: 95)

# Dependency // Centre-Periphery



Galtung:

Hvilken relation medierer en traktor?

# Dependency *//* Centre-Periphery

- Centre-Centre (e.g. USA)

- Periphery-Centre (e.g. Saudi Arabia)

- Centre-Periphery (US workers)

- Periphery-Periphery (e.g. Shia Muslims)

- De to førstnævnte har fælles interesser

- De to sidstnævnte kommer ud med den tabende hånd – især Periphery-Periphery

# Der sker et "knæk" i 1970erne

- Reorientering mod technology transfer internt i lande – klyngedannelse a la Porter og Katrinebjerg

  - "less ideological and more economic" (Seely: 22)

- Alternative tilgange

  - Needs, culture, values... of recipients!

- Basic Needs

- Community building

- Paulo Freire er en inspiration

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# Hov, der kom de igen

# Problemet: a growing gap

- The Digital Divide
  - Et nyt strukturelt "gap" opstår i 1990erne
  - Sammenfald mellem økonomisk og teknologisk segmentering

Information tools, such as the personal computer and the Internet, are increasingly critical to economic success and personal advancement. *Falling Through the Net: Defining the Digital Divide* finds that more Americans than ever have access to telephones, computers, and the Internet. At the same time, however, NTIA has found that **there is still a significant "digital divide" separating American information "haves" and "have nots."** Indeed, in many instances, the digital divide has *widened* in the last year.

(NTIA, 1999, p. xiii)

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# Fornyet convergence

Global Village – Global information society

Governments of the Industrial World, you weary giants of flesh and steel, I come from Cyberspace, the new home of Mind. On behalf of the future, I ask you of the past to leave us alone. You are not welcome among us. You have no sovereignty where we gather.

John Perry Barlow

As children grow up on the internet they're going to be more global than their parents. […] We are definitely going to have a global culture and we're going to have a single language. Now, maybe this is in a thousand years and maybe it's- I mean, you and I won't be around.

(Negroponte @ WEF)

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# Modernisation og Tigerspring

This (information) technology is far less capital-intensive than old industrial technology, and therefore may enable poor countries to *leapfrog some of the long and painful stages of development* that others had to go through.

(Kofi Annan quoted in Pal, 2008 - emphasis added)





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Centre-Periphery

# **Manuel Castells**

- Transformation fra
    - Produktionsformer baseret på energi til information
    - Space of place til space of flows
- *Space of flows*
    - Ahistorisk og apolitisk sted spredt over hele jorden
    - Her bor eliter uden tilknytning til omkringliggende område
- Space of place – a fourth world of disconnected black holes
    - Her bor almindelige mennesker – udkantsdanmark?

# Bridging the Digital Divide

…the real issue is whether it is actually possible to use ICTs effectively to help transform the lives of poor people and marginalised communities *despite* the global interests that seek to maintain competitive advantages and thus digital divides at a range of scales.
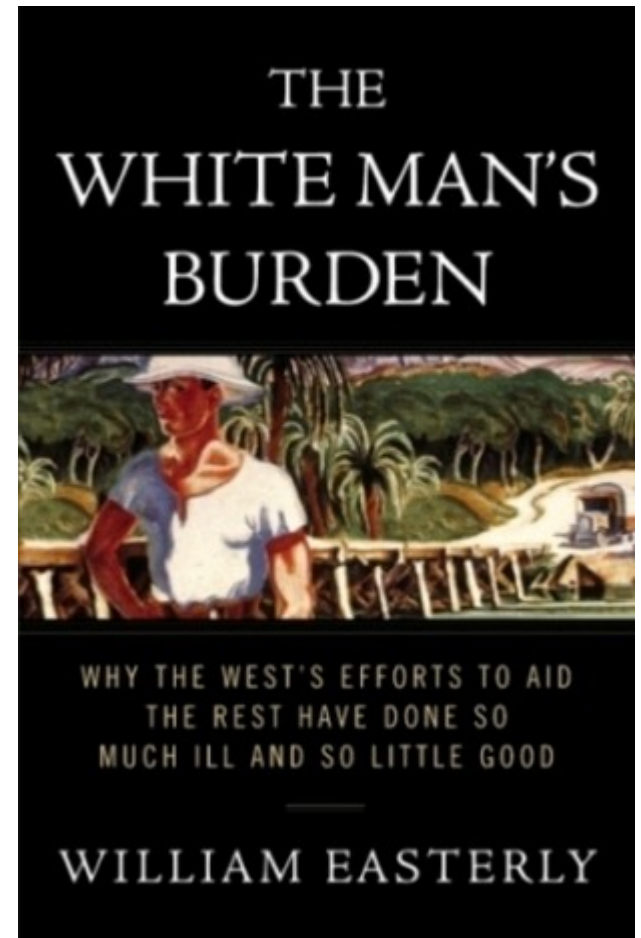
(Unwin, 2009, p. 26 – my emphasis)

Overførsel af IT i praksis er dog svært

...practitioners face significant technology transfer challenges […] Computers appear to be a universal technology […] but their adoption and use in different cultures suggests reality is much more complex...

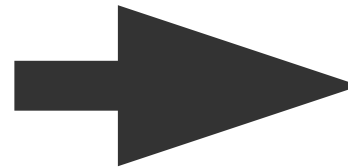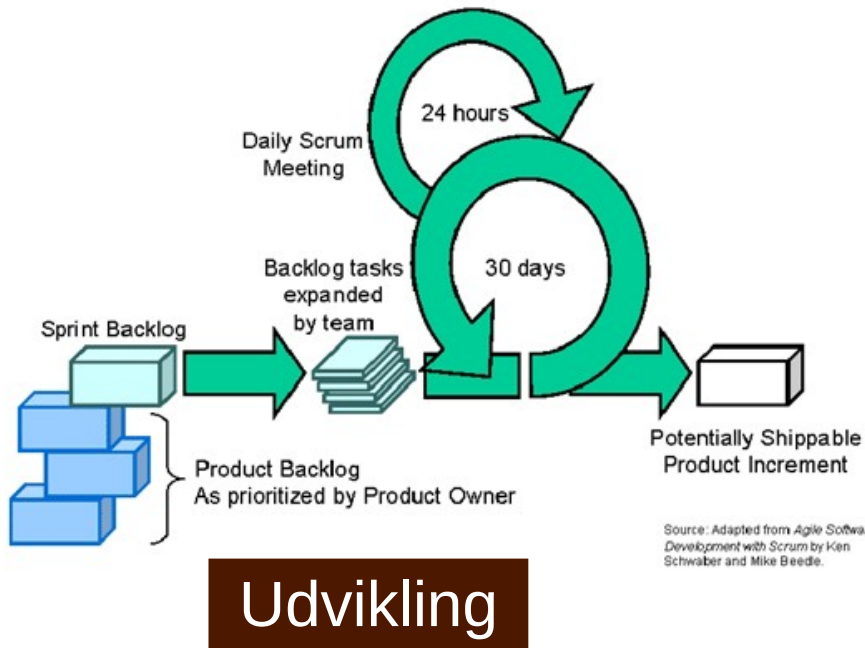(Seely, s. 30)

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# Re-inventions

Link: *translation*







http://www.lusakatimes.com/2008/11/18/mosquito-nets-mistaken-for-fishing-nets-in-nangoma/

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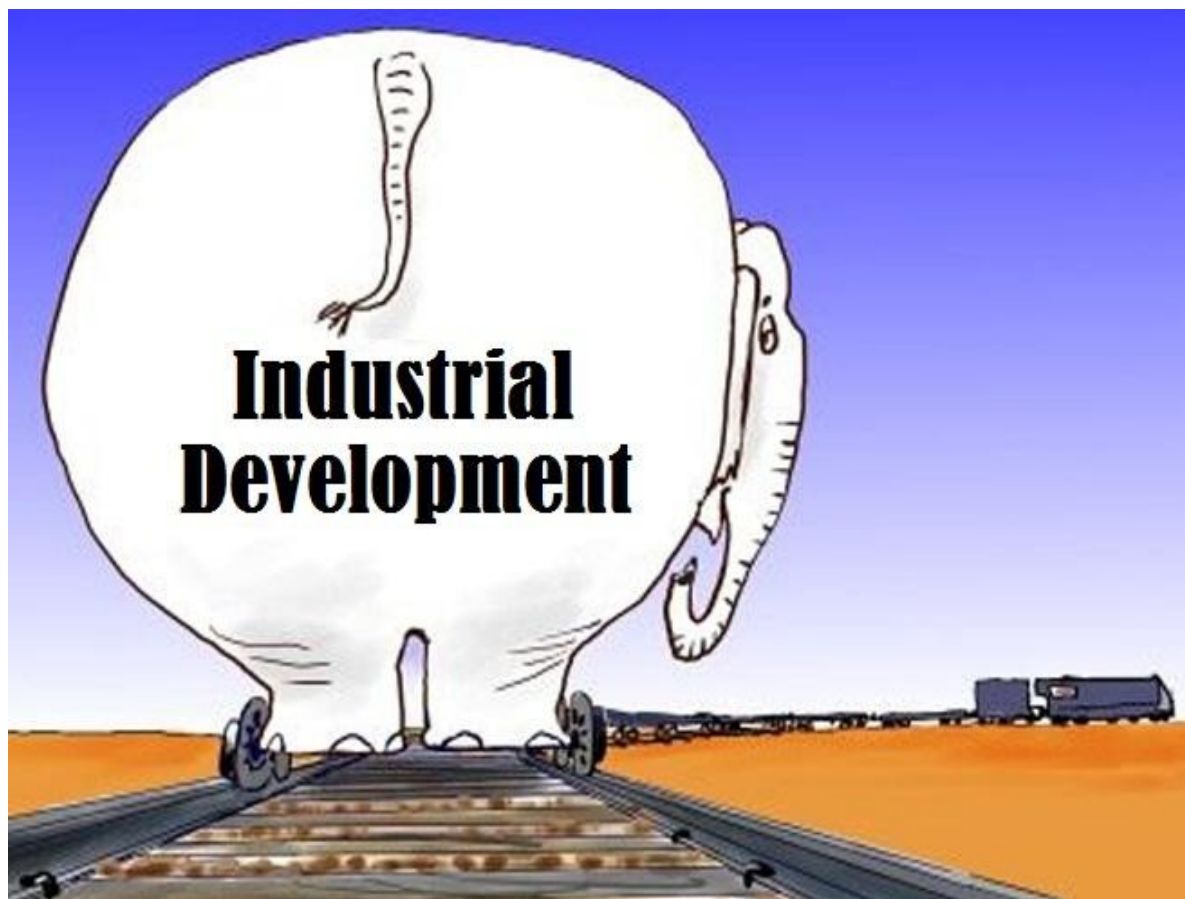# Re-inventions

Link: *translation*



Udvikling

Transfer

Brug

...there was no "it" to select, implement, evaluate, or bring in accordance with, except in an extremely vague, unspecified sense […] The innovation was to be **invented on the inside**, not imported from the outside...

(Charters & Pellegrin, 1973, p. 13)

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# Hvide Elefanter



Værste konsekvens af, at teknologier ikke forbliver det samme..