

Tamedia building, Zurich Stauffacher. Architect: Shigeru Ban



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Chicago World Fair 1933/34

„A Century of Progress“

Motto:

**„Science discovers, genius invents,
industry applies, and man adapts himself
to, or is molded by, new things.“**

Agree?

The 50 Greatest Breakthroughs Since the Wheel

The Atlantic, November 2013

1. The printing press, 1430s
2. Electricity, late 19th century
3. Penicillin, 1928
4. Semiconductor electronics, mid-20th century
5. Optical lenses, 13th century
6. Paper, second century
7. The internal combustion engine, late 19th century
8. Vaccination, 1796
9. The Internet, 1960s
10. The steam engine, 1712
11. Nitrogen fixation, 1918
- (...)
13. Refrigeration, 1850s
- (...)
18. The automobile, late 19th century
- (...)

The 50 Greatest Breakthroughs Since the Wheel (II)

The Atlantic, November 2013

20. The pill, 1960

Launched a social revolution

(...)

22. The green revolution, mid-20th century

Norman Borlaug, the agricultural economist who devised this approach, has been

credited with saving more than 1 billion people from starvation.

(...)

30. The moldboard plow, 18th century

Without it, agriculture as we know it would not exist in northern Europe or the American Midwest.

(...)

The 50 Greatest Breakthroughs Since the Wheel (III)

The Atlantic, November 2013

33. Pasteurization, 1863

(...)

44. Air-conditioning, 1902

Would you start a business in Houston or Bangalore without it?

(...)

46. Anesthesia, 1846

In response to the first public demonstration of ether, Oliver Wendell Holmes Sr. wrote: “The fierce extremity of suffering has been steeped in the waters of forgetfulness, and the deepest furrow in the knotted brow of agony has been smoothed for ever.”

From the diary of Elias Haffter, April 8th, 1847 (one month after Haffter learned about the possibility of anaesthesia)

1/2 11 Uhr unternahm ich die Operation Gott sei Dank glücklich und ohne Schwefeläther, wozu weder mein Assistent, noch ich, noch die Patientin [eine «alte Frau»] Lust hatte. Sie ertrug die Operation aber auch sehr standhaft. Auf den Abend war ich mit Wilhelm bei Frau Häberlin, dann bei Hause sangen wir einige Quartette.

At half past 10 I undertook the operation, thank God, luckily and without sulfuric ether, for which neither my assistant, nor I, nor my patient [an old woman] were in the mood. She bore it very bravely. In the evening I went with Wilhelm to Ms. Häberlin, and back home, we sang some quartets.

Some common assumptions on technological change

- The linear model: scientific discovery leads to technical innovation leads to changes in society (progress)
- Technological progress consists of innovation
- The new replaces the old
- The more efficient replaces the less efficient
- The alternative to change is stagnancy
- There is a path towards progress which is more or less the same everywhere
- Technology transfer starts from the „developed“ to reach the „developing“ world

Some biases in the popular perception of technology

- big / fast / complex vs. small / slow / simple
- recent vs. old
- science based vs. experience based
- market driven vs. subsistence driven
- „male“ vs. „female“
- gear vs. infrastructure enabling the gear to work
- efficiency vs. diversity and resilience

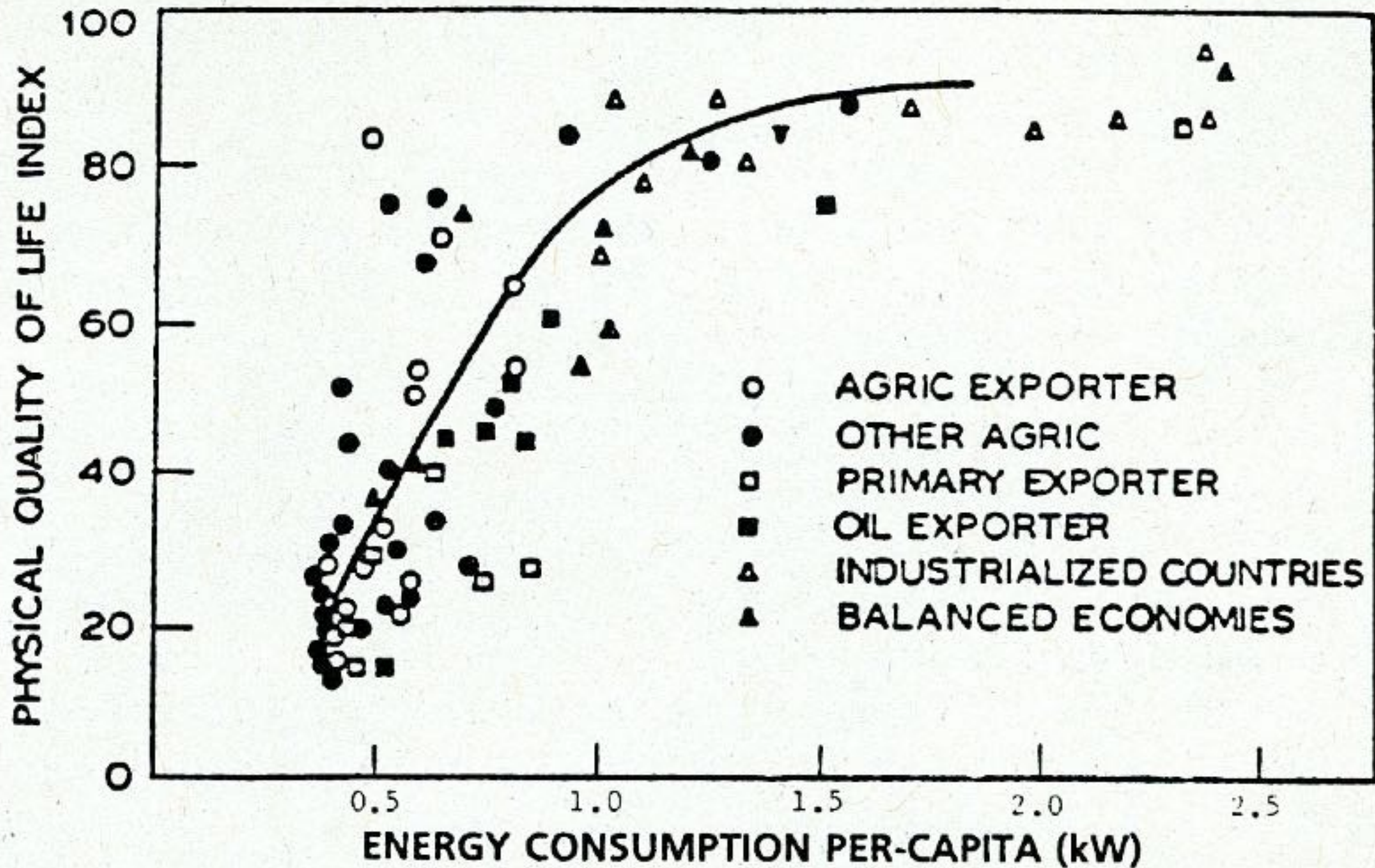
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**So what's—according to this motto—
the relationship between mankind and
technology?**

José Goldemberg: „One Kilowatt per Capita“, in:
Bulletin of the Atomic Scientists 46 (1990), No. 1, pp. 13-14



Supplementary material

Silvio Borner: «Von Sklaven und Segeln», in: *NZZ*, March 31st, 2017

This is an extreme example of an economist arguing with historical arguments free of historical knowledge but committed to a very simplistic notion of progress. Borner is prof. em. for economics at the University of Basel.

Borner argues with ERoEI figures. Are they right? You can check in this report.

«An Ecomodernist Manifesto», presented by The Breakthrough Institute, April 2015

The manifesto is an extreme (and typically californian in many aspects) example of techno-optimism, aimed at solving the ecological «challenges».