Double-S Curve

Social foundations before economic growth:
Developing countries 1960-2000
England 1500-1900

Taken from

"Social Foundations of Economic Development"

Unpublished paper, 1984

&

Feeling for Stones, 2004

Unpublished graphical notes, 2000

both by B.J. Heinzen

INTRODUCTION
## Social foundations of system change

In 1984, Barbara Heinzen gave a presentation to the scenarios group in Royal Dutch Shell, London, where these patterns from developing countries were first presented. Her presentation was based on a database created by the Statistical Unit of the United Nations Research Institute for Development (UNRISD) and the ideas were first proposed by Claude Richard at UNRISD. The statistics were later partially updated in 1990 for a paper published by Global Business Network in California. Both papers show that strong social foundations – especially health and education for the whole population – tend to precede rapid economic growth. Both papers have also been scanned for inclusion with other Articles and Presentations on this website. Look for (1985) "Social foundations of economics development" and (1991) "Unfinished revolutions".

When Barbara Heinzen began working on *Feeling for Stones*, she wanted to see whether the same pattern of early social foundations had preceded the invention of the industrial revolution in England. Drawing on a variety of sources, she learned that literacy rose slowly, but steadily long before industrialisation took off in England. Life expectation, however, did not improve dramatically until after germ theory began influencing medicine and public health in the late 19th century.

The following slides show the patterns for both developing countries and pre-industrial England. As the 1984 data base has since been lost, these are hand-drawn copies of the original articles. While UNRISD is still in existence, their Statistical Unit has since been closed down.
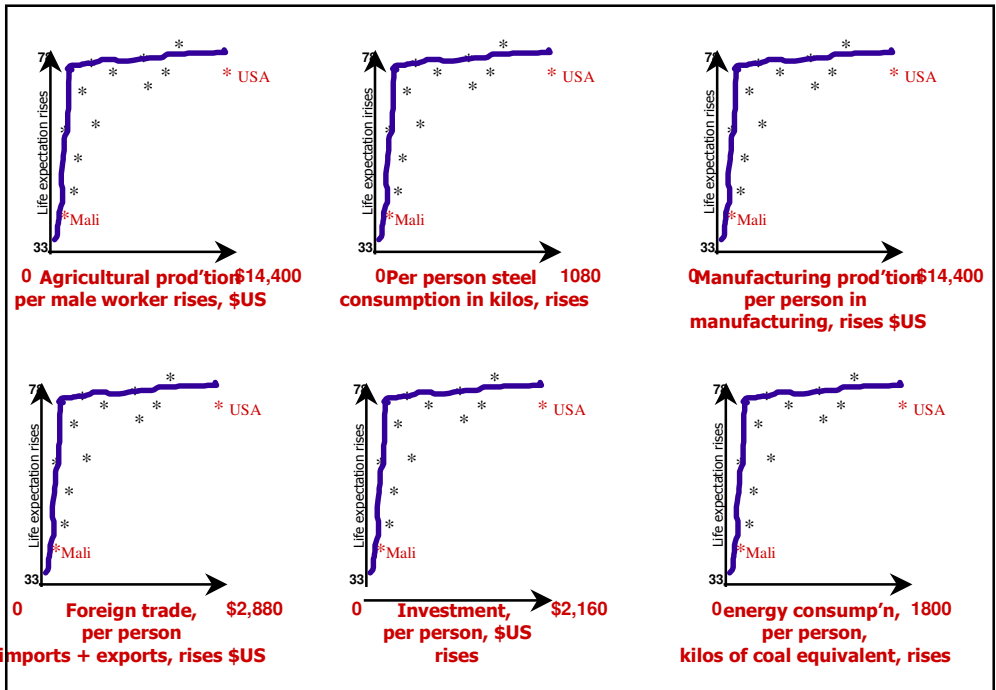
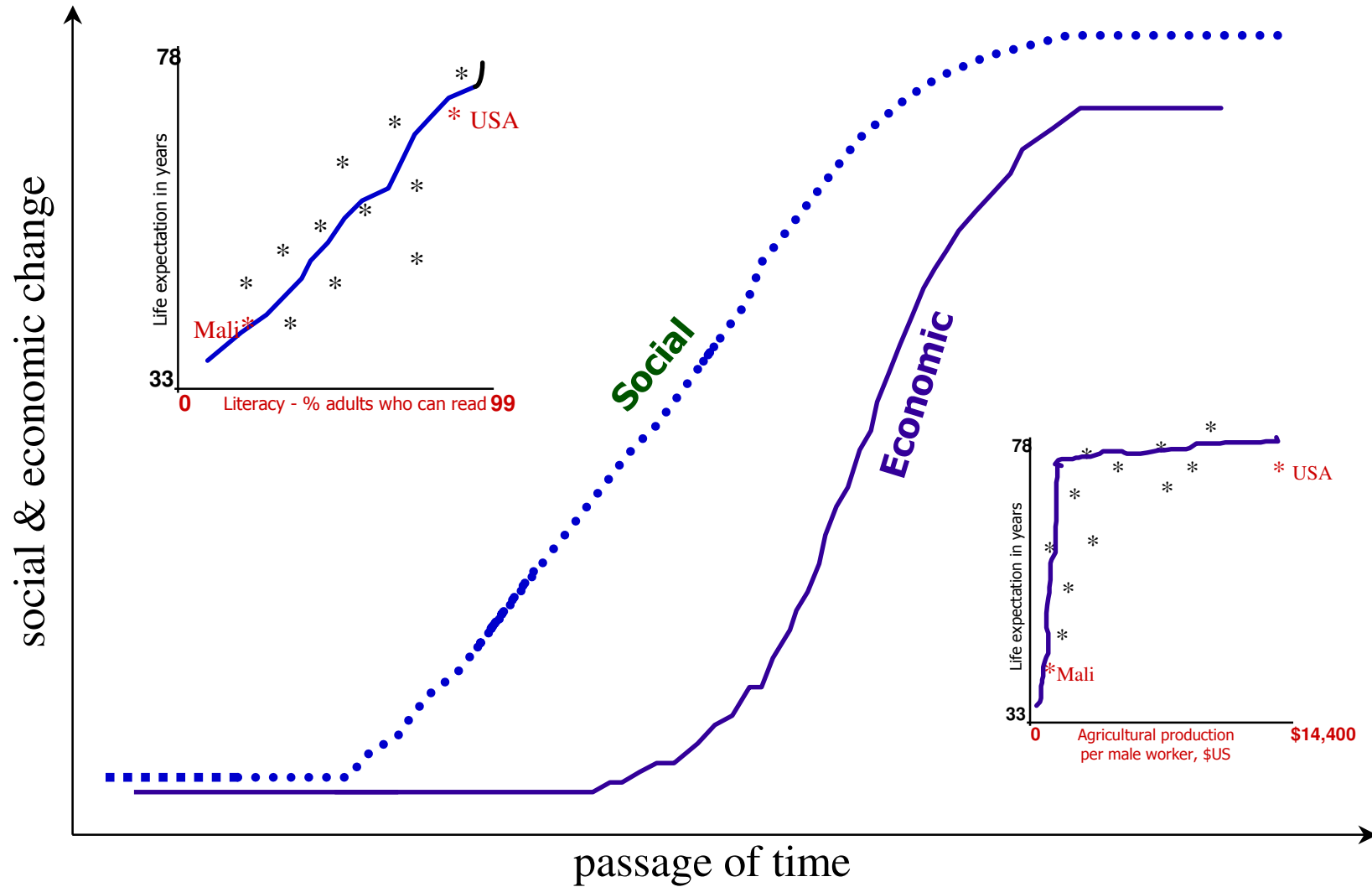# Lessons from Developing Countries 1960-2000
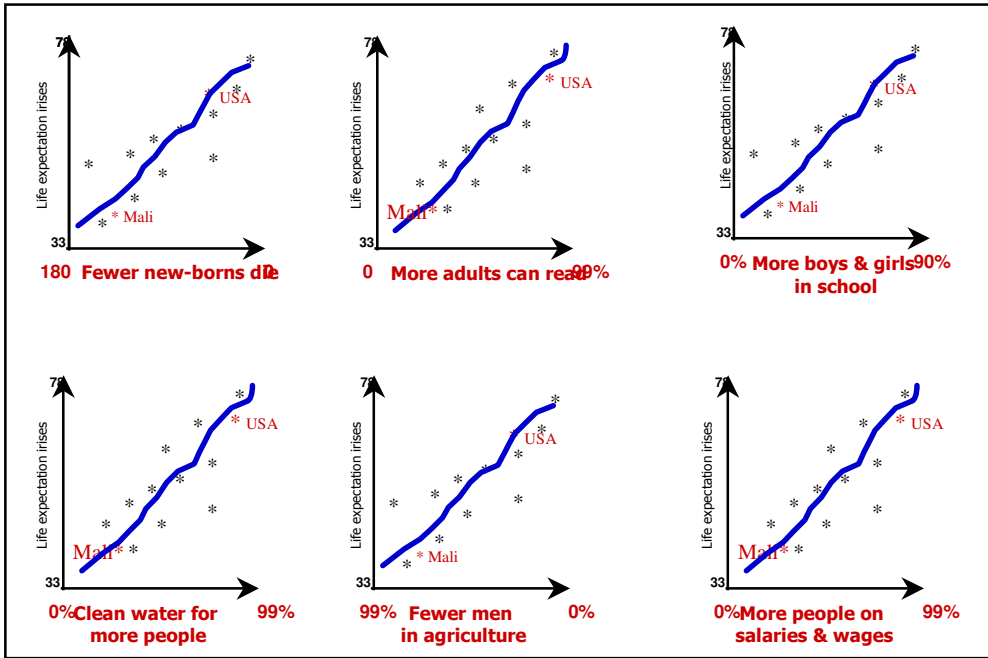
SIX SOCIAL INDICATORS
As life expectation rises, more people can read, more children stay in school, more people have access to clean water, fewer infants die, more men leave agriculture & more people are earning salaries and wages.

Social indicator graphs (each with "Life expectation rises" on vertical axis, 33 to 7_):
- 180 — **Fewer new-borns die** — USA, * Mali
- 0 — **More adults can read** — 99% — USA, Mali *
- 0% — **More boys & girls in school** — 90% — USA, * Mali
- 0% — **Clean water for more people** — 99% — USA, Mali *
- 99% — **Fewer men in agriculture** — 0% — USA, * Mali
- 0% — **More people on salaries & wages** — 99% — USA, Mali *

SIX ECONOMIC INDICATORS
Economic change is slow as social indicators change. When life expectation is 68.3 years, economic activity rises. Each person produces more as steel & energy consumption, trade & investment all rise.
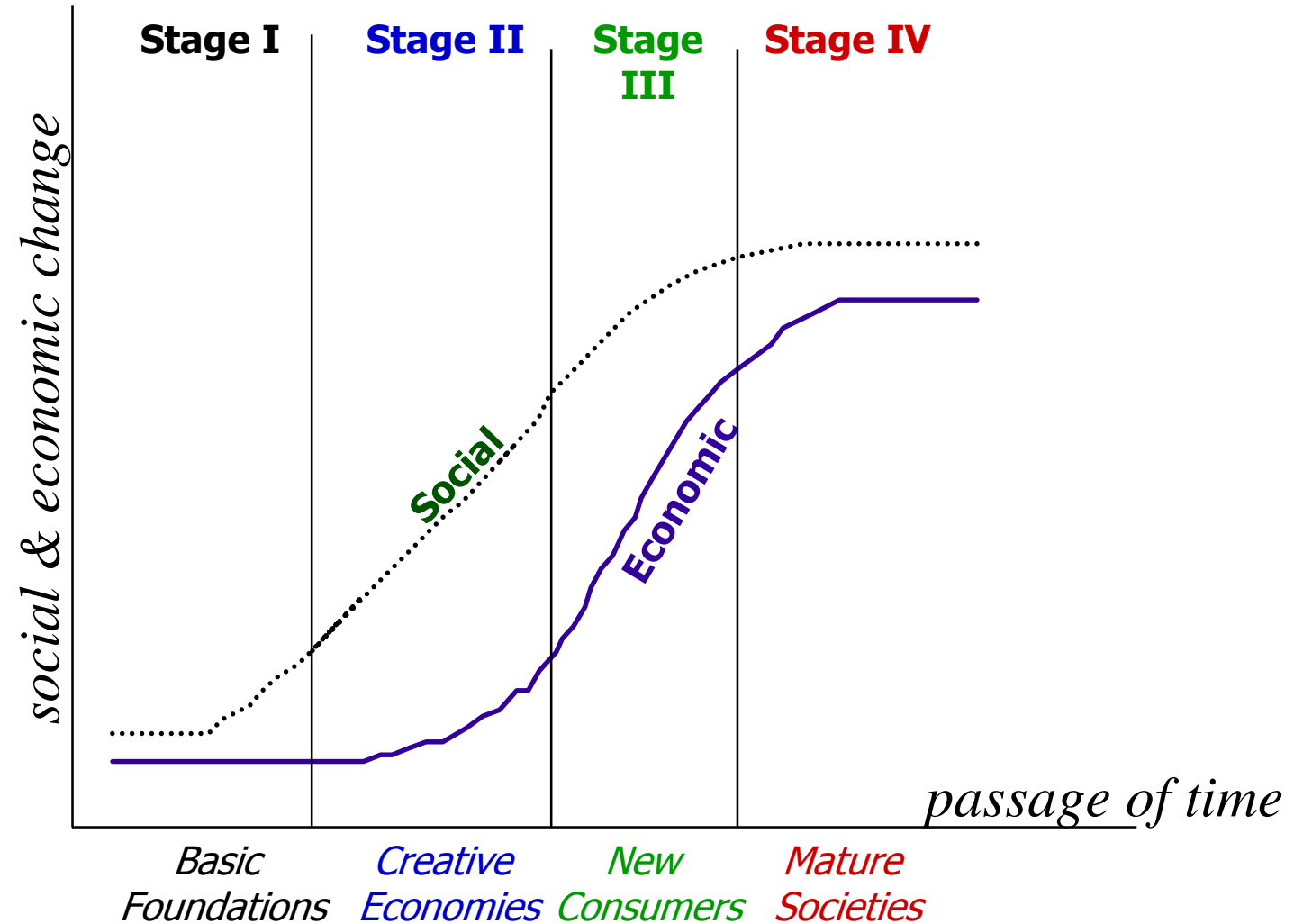
Economic indicator graphs (each with "Life expectation rises" on vertical axis, 33 to 7_):
- 0 — **Agricultural prod'tion per male worker rises, $US** — $14,400 — * USA, *Mali
- 0 — **Per person steel consumption in kilos, rises** — 1080 — * USA, *Mali
- 0 — **Manufacturing prod'tion per person in manufacturing, rises $US** — $14,400 — * USA, *Mali
- 0 — **Foreign trade, per person imports + exports, rises $US** — $2,880 — * USA, *Mali
- 0 — **Investment, per person, $US rises** — $2,160 — * USA, *Mali
- 0 — **energy consump'n per person, kilos of coal equivalent, rises** — 1800 — * USA, *Mali

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The Double-S Curve

social & economic change

passage of time

Social

Economic

Inset 1 (top left):
Life expectation in years
78
33
Mali*
* USA
0   Literacy - % adults who can read **99**

Inset 2 (bottom right):
Life expectation in years
78
33
*Mali
* USA
0   Agricultural production per male worker, $US   **$14,400**
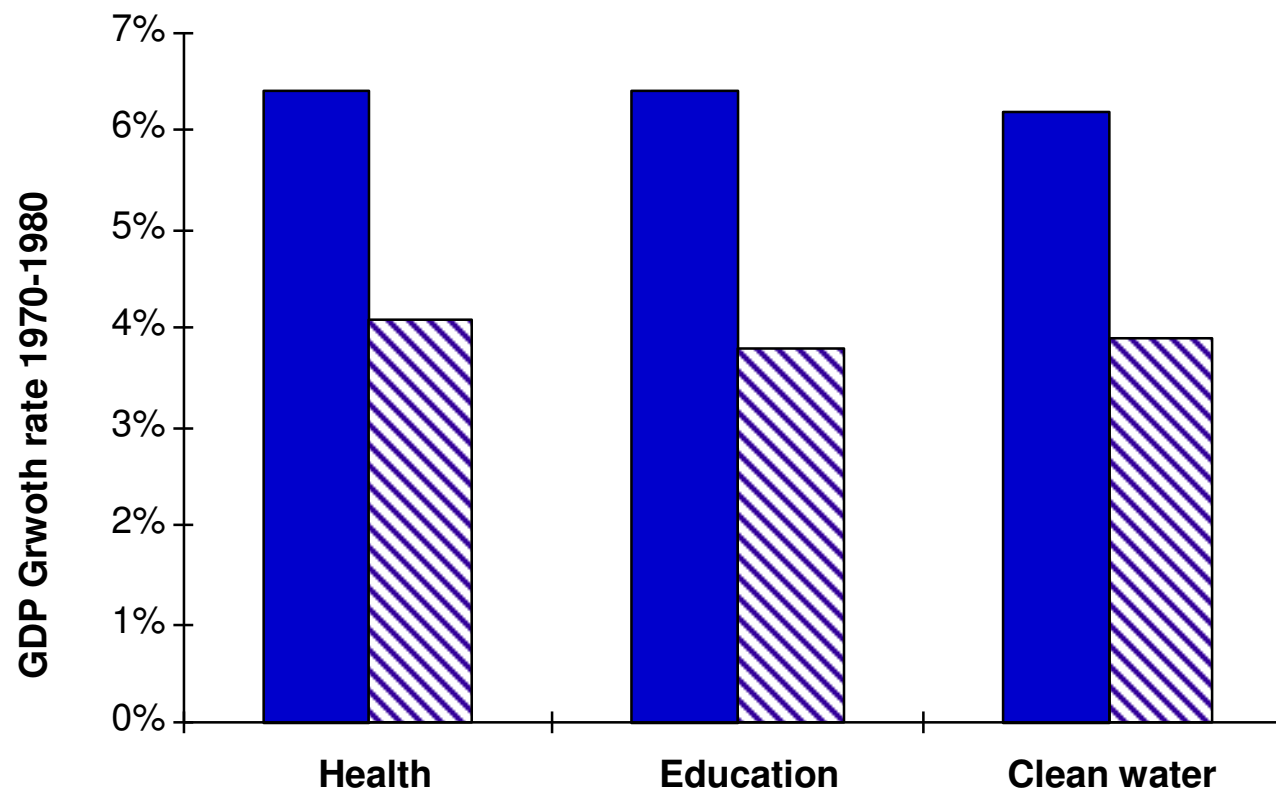
Late 20th Century Development Stages

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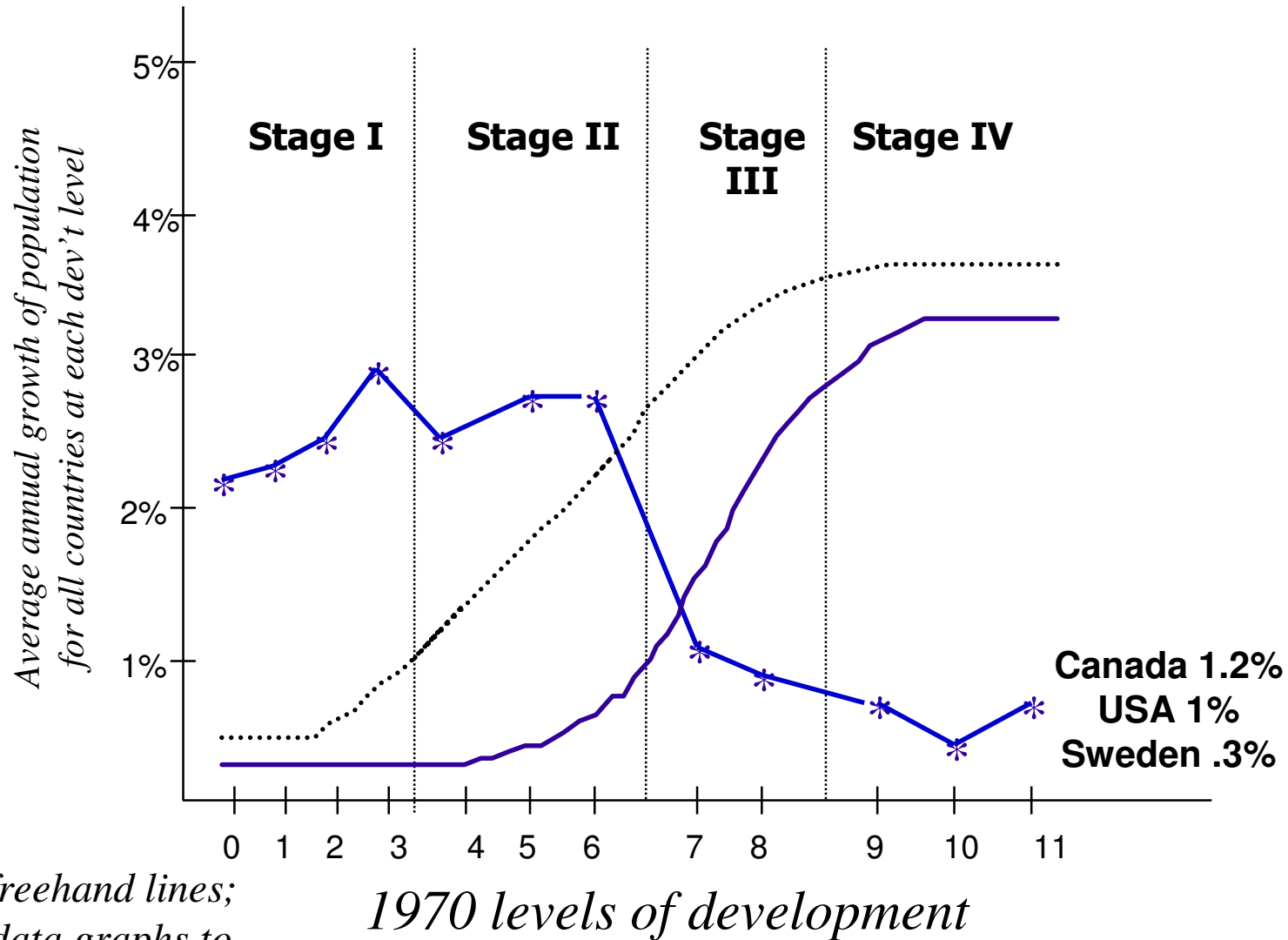# Economic Growth & 20ᵗʰ Century Development Stages
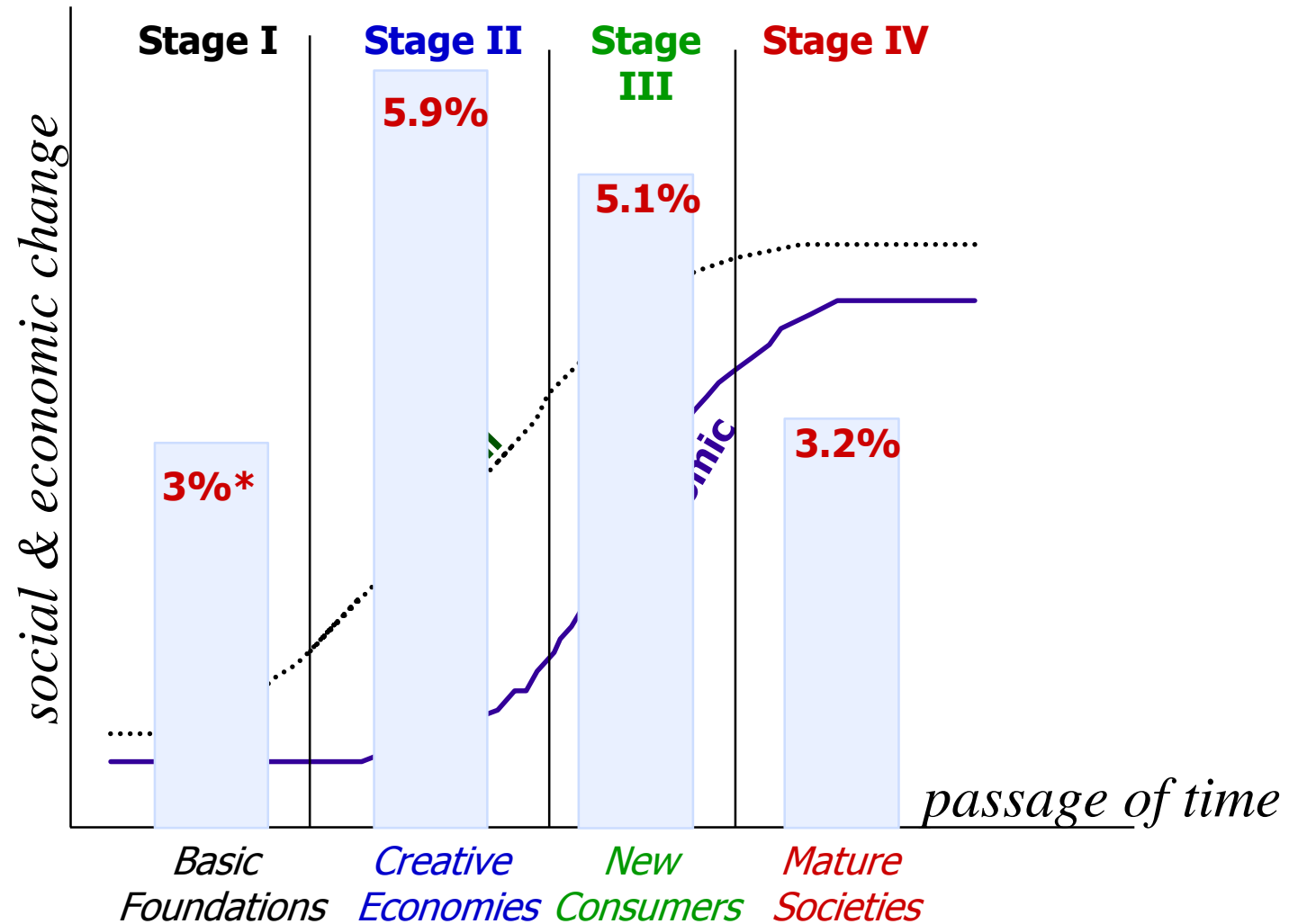
* 1970-80 growth rates of countries according to 1970 dev't level

unpublished paper, "Social Foundations of Economic Development", November 1984 by B.J. Heinzen

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1970 Social Foundations & GDP Growth 1970-'80

15 countries where 1970 level of health, education or access to water was <u>higher</u> than GDP per capita in 1970.

All other countries in each sample

1970-1982 Population Growth by 1970 Development Stages

Average annual growth of population for all countries at each dev't level

Stage I   Stage II   Stage III   Stage IV

5%
4%
3%
2%
1%

0 1 2 3 4 5 6 7 8 9 10 11

1970 levels of development

Canada 1.2%
USA 1%
Sweden .3%

(NB: freehand lines; real data graphs to be scanned in)

1970 Social Indicators as Growth Predictors 1970-'80

High Growth Predicted & Seen

• Philippines	6.3%
• Kenya	6.5%
• Bulgaria	7.1%
• Thailand	7.2%
• Indonesia	7.6%
• Malaysia	7.8%
• Singapore	8.5%
• Paraguay	8.6%
• Romania	8.6%
• Ecuador	8.8%
• Poland	8.9%
• Hong Kong	9.0%
• South Korea	9.5%

High Growth Predicted, but Not Seen

• Zaire	0.1%
• Peru	3.0%
• India	3.6%
• Spain	4.0%
• El Salvador	4.1%
• Sri Lanka	4.1%
• East Germany	4.8%
• Bolivia	4.8%
• Greece	4.9%

Growth Seen, but Not Predicted

• Malawi	6.3%	• Lesotho	7.9%
• Nigeria	6.5%	• Brazil	8.4%
• Dominican Republic	6.6%	• Yemen Arab Republic	9.2%
• Ivory Coast	6.7%	• Syria	10.0%
• Algeria	7.0%	• Saudi Arabia	10.6%
• Egypt	7.4%	• Iraq	12.1%
• Tunisia	7.5%		

1970 UNRISD Indicators - By Shape of Curve
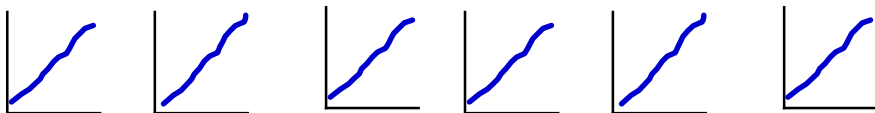
SOCIAL INDICATORS - A GRADUAL CURVE

Health
Life expectation
infant mortality
Access to clean water

Education
Adult Literacy
School enrolment of boys & girls

Nature of Employment
Men in agriculture:
as % of working men
Salaried & wage earners:
% of work'g men & women

ECONOMIC INDICATORS - 'ELBOW' CURVE

Direct Personal Consumption
Daily newspapers in circulation
Telephones per 100,000 population
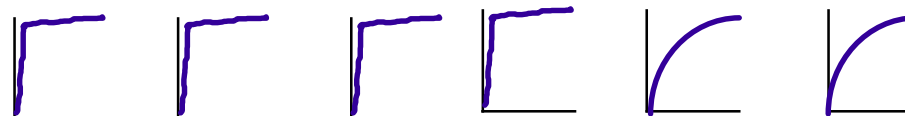Televisions per 1,000 population
Animal protein consumption per head

Consumption by Economy at Large
Investment per capita
Foreign trade per capita
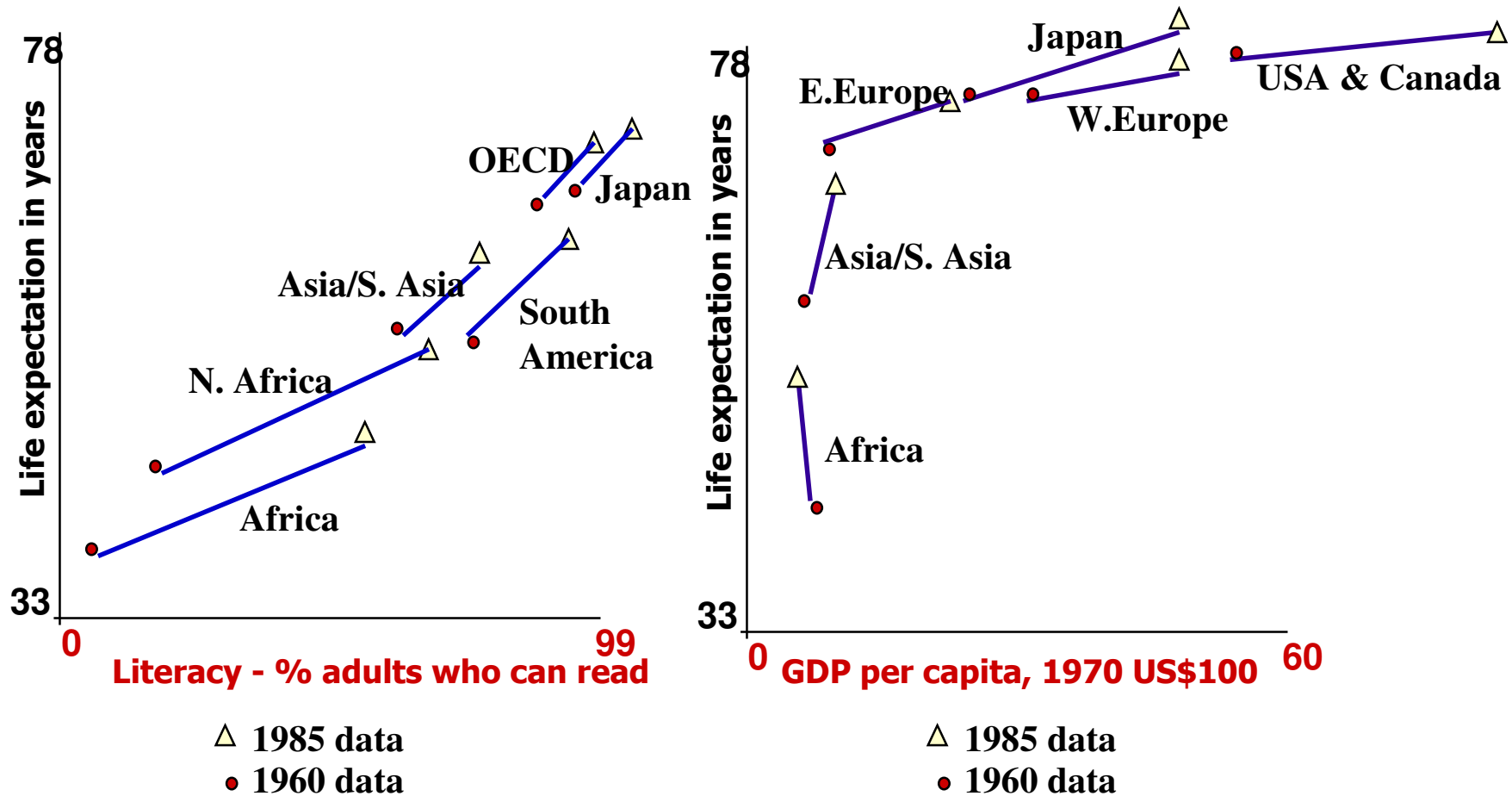Steel consumption per capita
Energy consumption per capita

Production & Productivity
Agriculture production per man in agriculture
Manufacturing production per person in mf.*
Professional & technical workers
as % of working population*

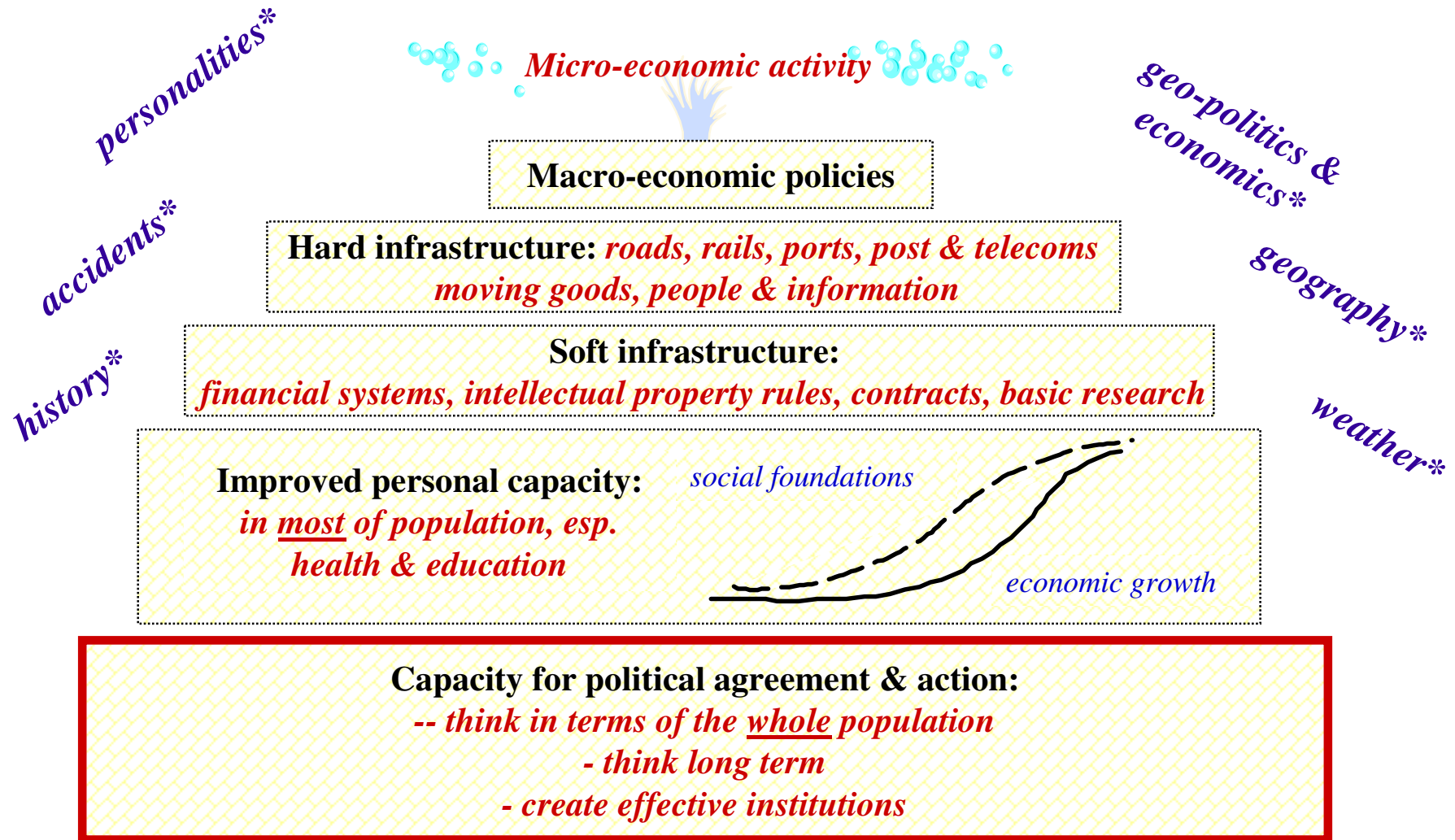*these two indicators curved moderately,
rather than sharply

Double-S Curve in 1985

Left chart:
Y-axis: Life expectation in years (33 to 78)
X-axis: Literacy - % adults who can read (0 to 99)

Labels: OECD, Japan, Asia/S. Asia, N. Africa, South America, Africa

△ 1985 data
● 1960 data

Right chart:
Y-axis: Life expectation in years (33 to 78)
X-axis: GDP per capita, 1970 US$100 (0 to 60)

Labels: Japan, E.Europe, W.Europe, USA & Canada, Asia/S. Asia, Africa

△ 1985 data
● 1960 data

Development's Building Blocks

personalities*

accidents*

history*

Micro-economic activity

geo-politics & economics*

geography*

weather*

Macro-economic policies

Hard infrastructure: *roads, rails, ports, post & telecoms moving goods, people & information*

Soft infrastructure:
financial systems, intellectual property rules, contracts, basic research

Improved personal capacity: *in most of population, esp. health & education*

social foundations

economic growth

Capacity for political agreement & action:
-- think in terms of the whole population
- think long term
- create effective institutions

(*"If you can't be wise, be lucky…")

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The English Experience 1100-1750

Popular & elite education

Percent of Oxford students who were 'plebs'

1570-1630	1630ff	1711	1760	1810
> 50%	37%	27%	17%	1%

husbandmen, clothworkers, trades, glovers

Literate men
Literate women

Popular learning - popular knowledge
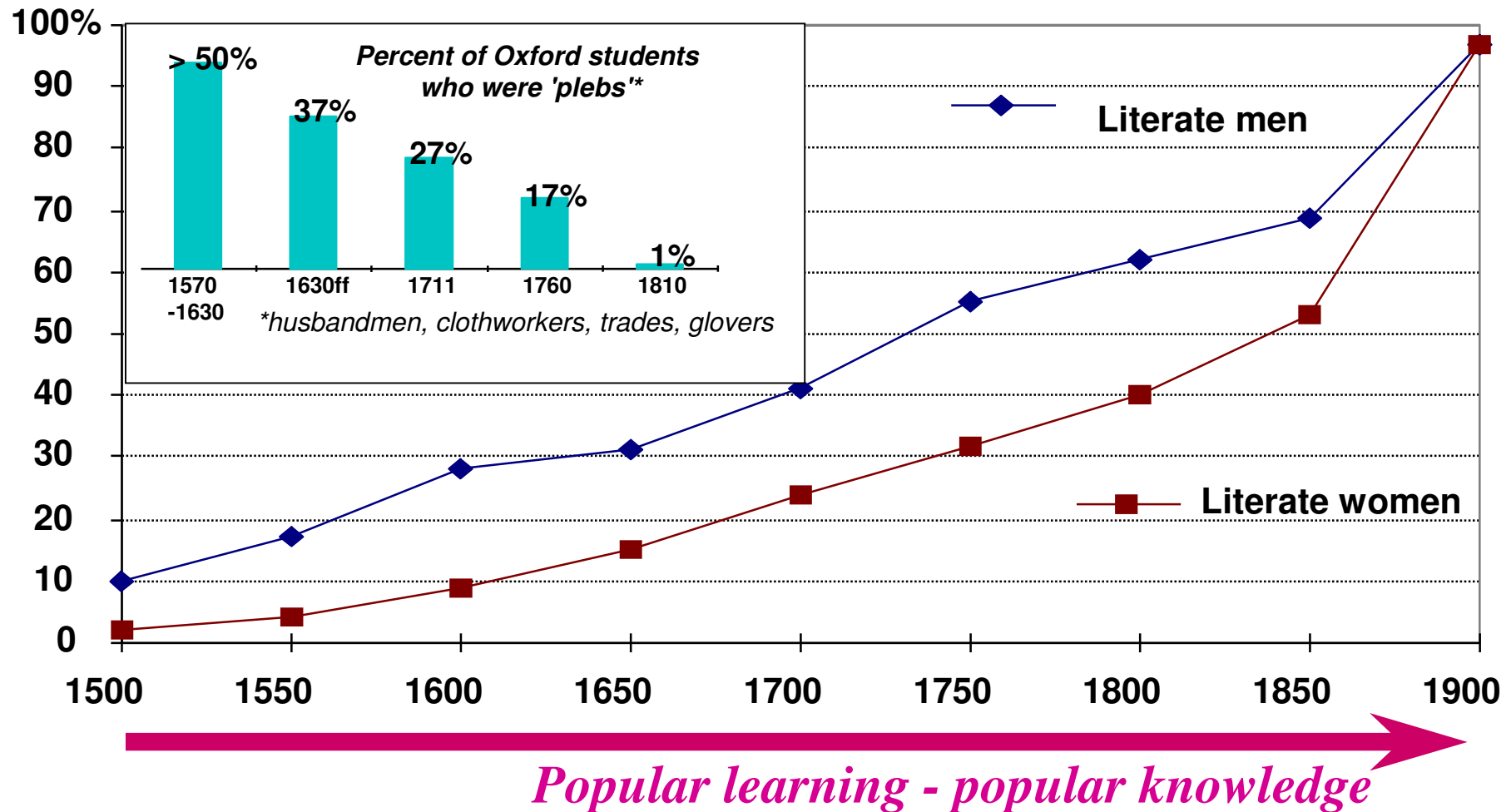
*Literacy data from Literacy and the Social Order by David Cressy, Cambridge University Press, numbers read off graph on p. 177. **Perhaps as many as another 1/3 knew how to read, but not how to write.** Nigel Whealey, Writing and Society: Literacy, print and politics in Britain 1590-1660. Routledge, London and New York, 1999, p. 22.*

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English Life Expectation 1541-1866
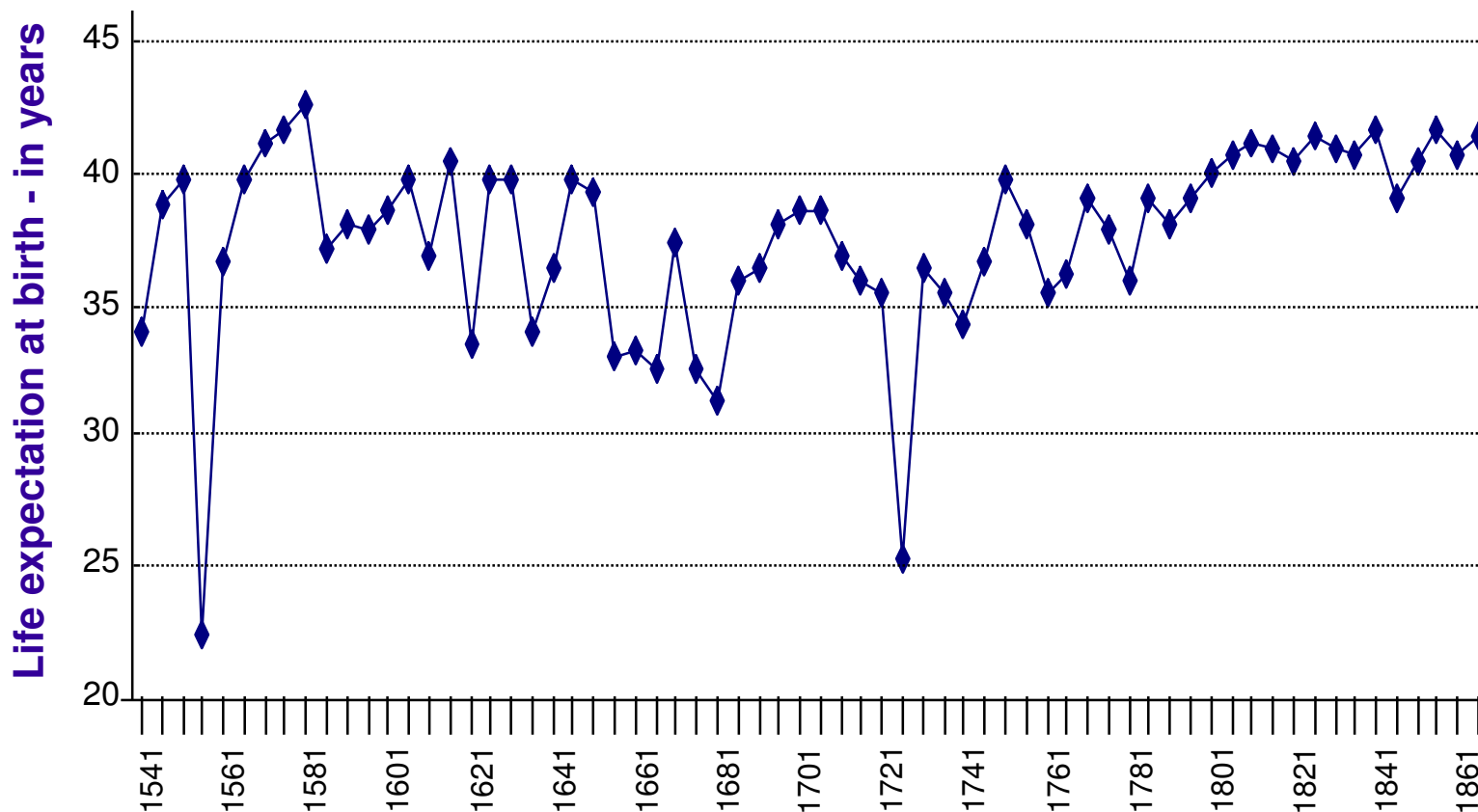
The two low points of 1561 and 1721 represent surges in the death rate, neither of which was explained by the authors, who remarked that their job is still only "half done", as they have collected the data, but not yet explained it.

Source: data from <u>English Population History from Family Reconstitution 1580-1837.</u> Authors: E.A. Wrigley, R.S. Davies, J.E. Oepen, R.S. Schofield. Cambridge University Press, 1997, Table A9.1, Appendix 9, p. 614. This is quinquennial demographic data produced by generalised inverse projection.
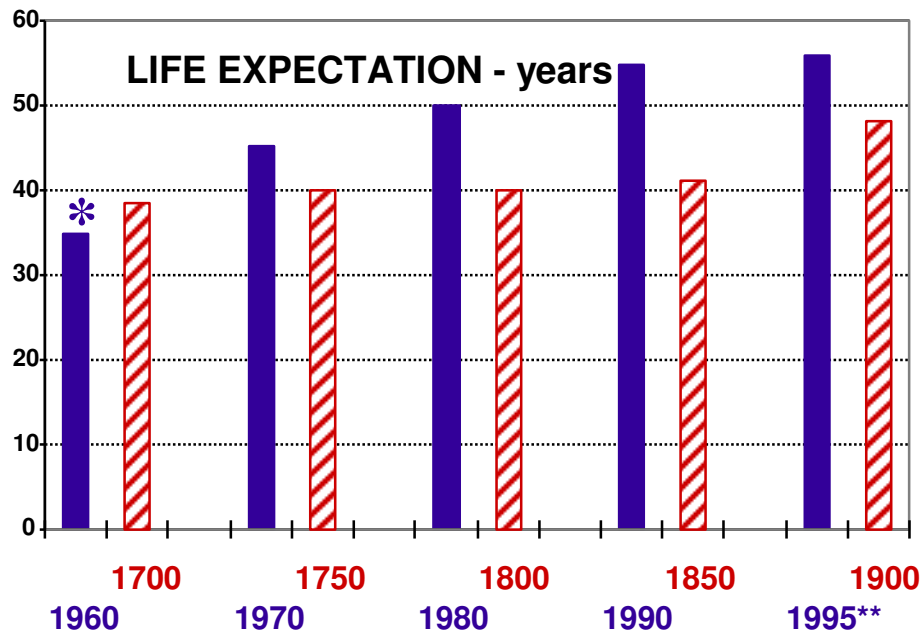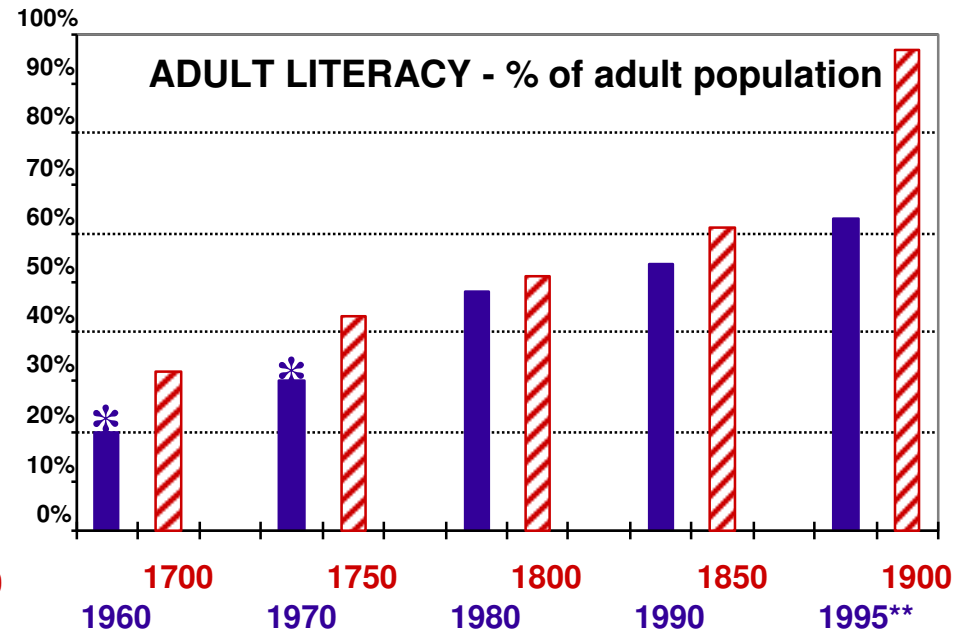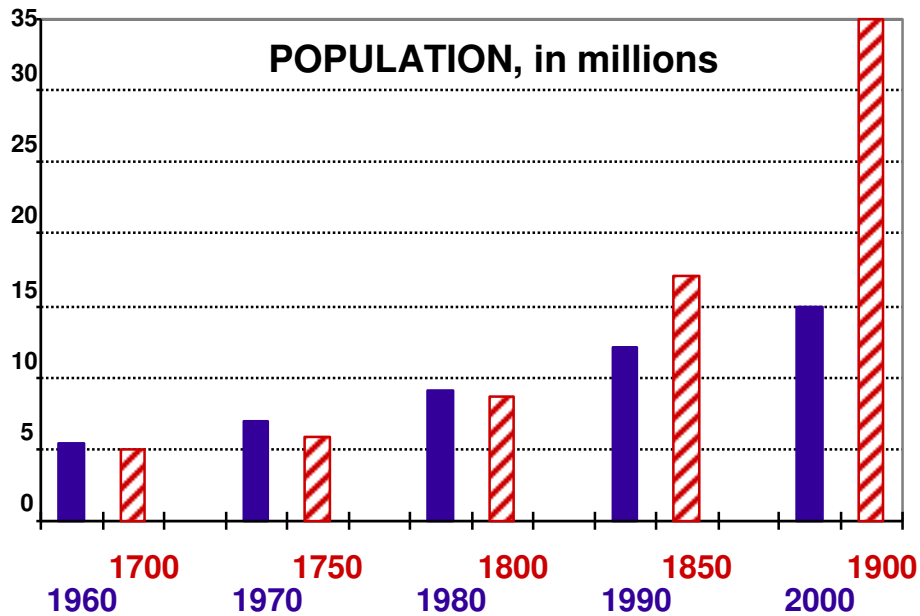
Life Expectation & Literacy
Early England v. the Modern World
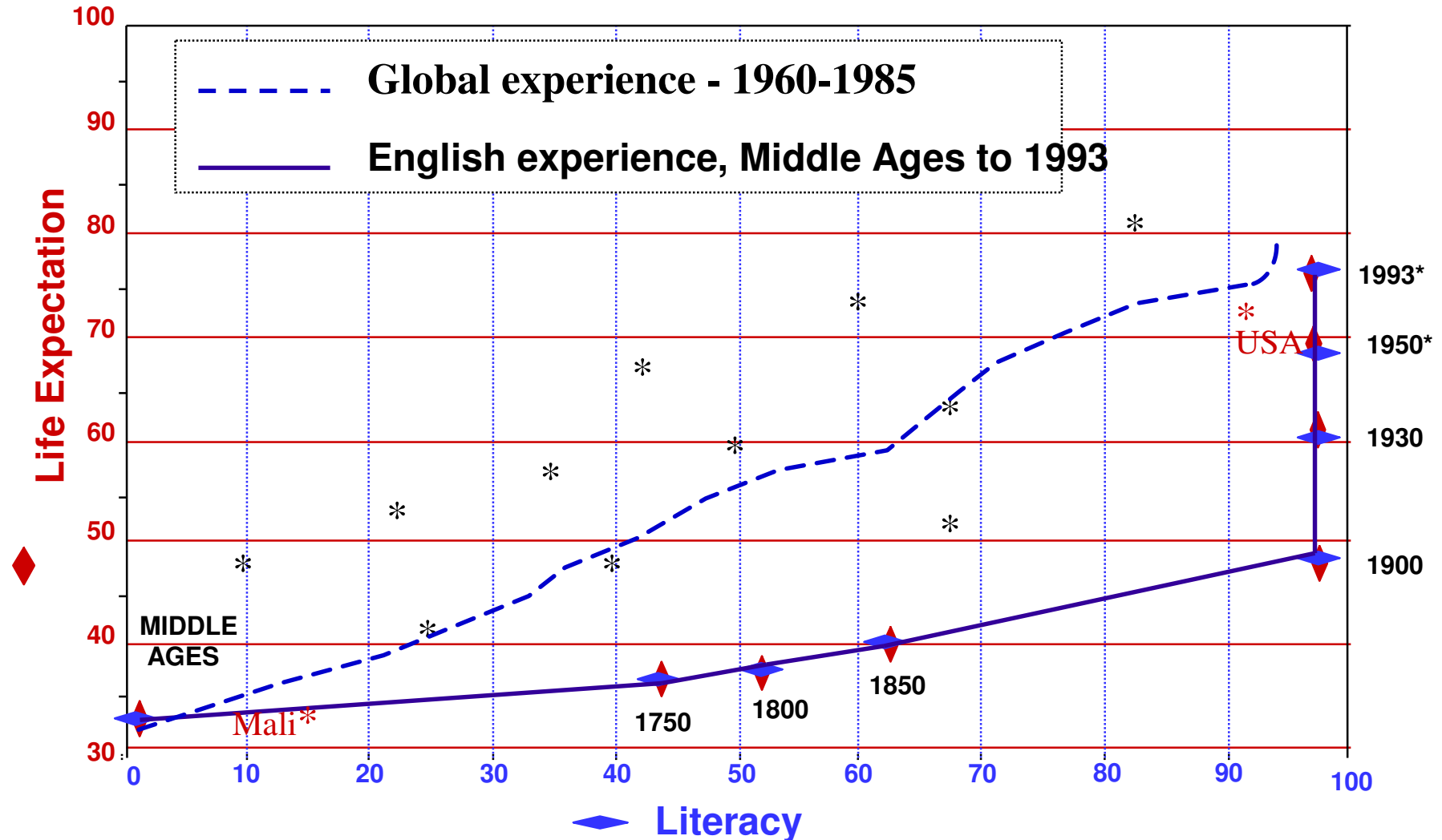
English literacy data for 1750=1900 from <u>Literacy and the Social Order</u> by David Cressy, Cambridge University Press, numbers read off graph on p. 177;
extrapolated for 1950-1993 **NB: check data. '; Life expectation from <u>A Concise History of World Population,</u> 2nd edition, 1997, by Massimo Livi-Bacci, 1997, p. 121, except Middle Ages, which is from G. Melvyn Howe, <u>People, Environment, Disease and Death: A Medical Geography of Britain throughout the Ages,</u> University of Wales Press, Cardiff, 1997, p. 3.; 1960-1985 global data is hand drawn only, should be copied from: B. Heinzen "Unfinished Revolutions", GBN, 1990*

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Population, literacy & life expectation

in
pre-industrial England
& 20th century Cameroon

POPULATION, in millions

ADULT LITERACY - % of adult population

LIFE EXPECTATION - years

■ **Cameroon** ▨ **England**

* Note: Cameroon's literacy for 1960 & 1970, plus life expectation for 1960 are my own 'best guesses'; no data are available.
** Data for Cameroon's literacy & life expectation in the year 2000 are not yet published.

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