

# HUMAN ECOLOGY

**Another approach to the place of  
humans on the planet**

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**What has gone up steeply in the last few decades?**

**the human population**

**the consumption of fossil fuels of other resources**

**agricultural activity**

**desertification**

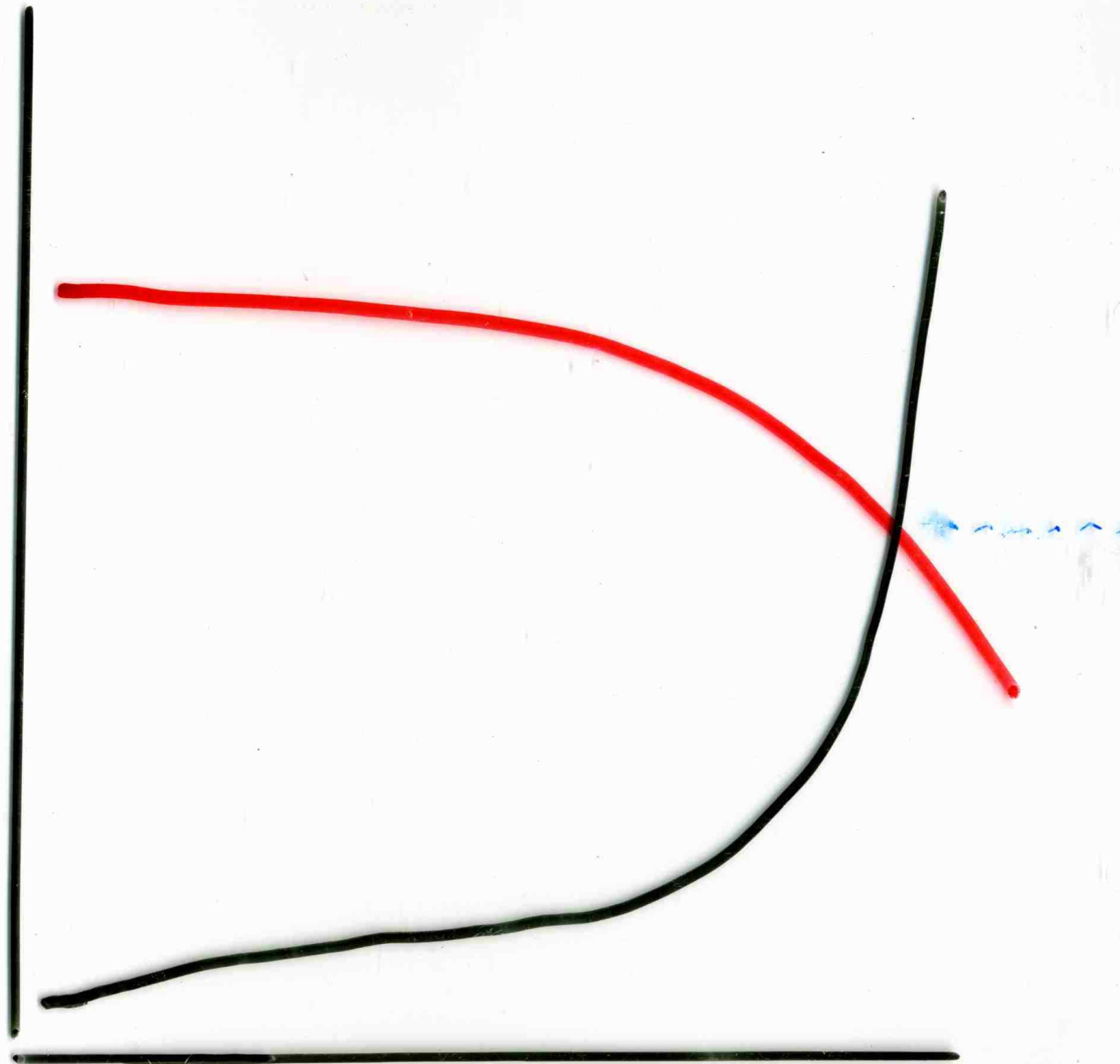
**Pollution**

**and much else**

Amount

1750

2000



# What has been coming down?

Forest cover

Soil quality

fresh water

fish stocks

whales

habitats, ecosystem health

environmental services

bio-diversity

human diversity

Greece: quote from Plato:

*"Contemporary Attica may be described as a mere relic of the original country. There has been a constant movement of soil away from the high ground and what remains is like the skeleton of a body emaciated by disease. All the rich soil has melted away, leaving a country of skin and bone. Originally the mountains of Attica were heavily forested. Fine trees produced timber suitable for roofing the largest buildings; the roofs hewn from this timber are still in existence. The country produced boundless feed for cattle, there are some mountains which had trees not so very long ago, that now have nothing but bee pastures. The annual rainfall was not lost as it is now through being allowed to run over the denuded surface to the sea, it was absorbed by the ground and stored...the drainage from the high ground was collected in this way and discharged into the hollows as springs and rivers with abundant flow and a wide territorial distribution. Shrines remain at the sources of dried up water sources as witness to this." (Th.)*

Compare with modern quote:

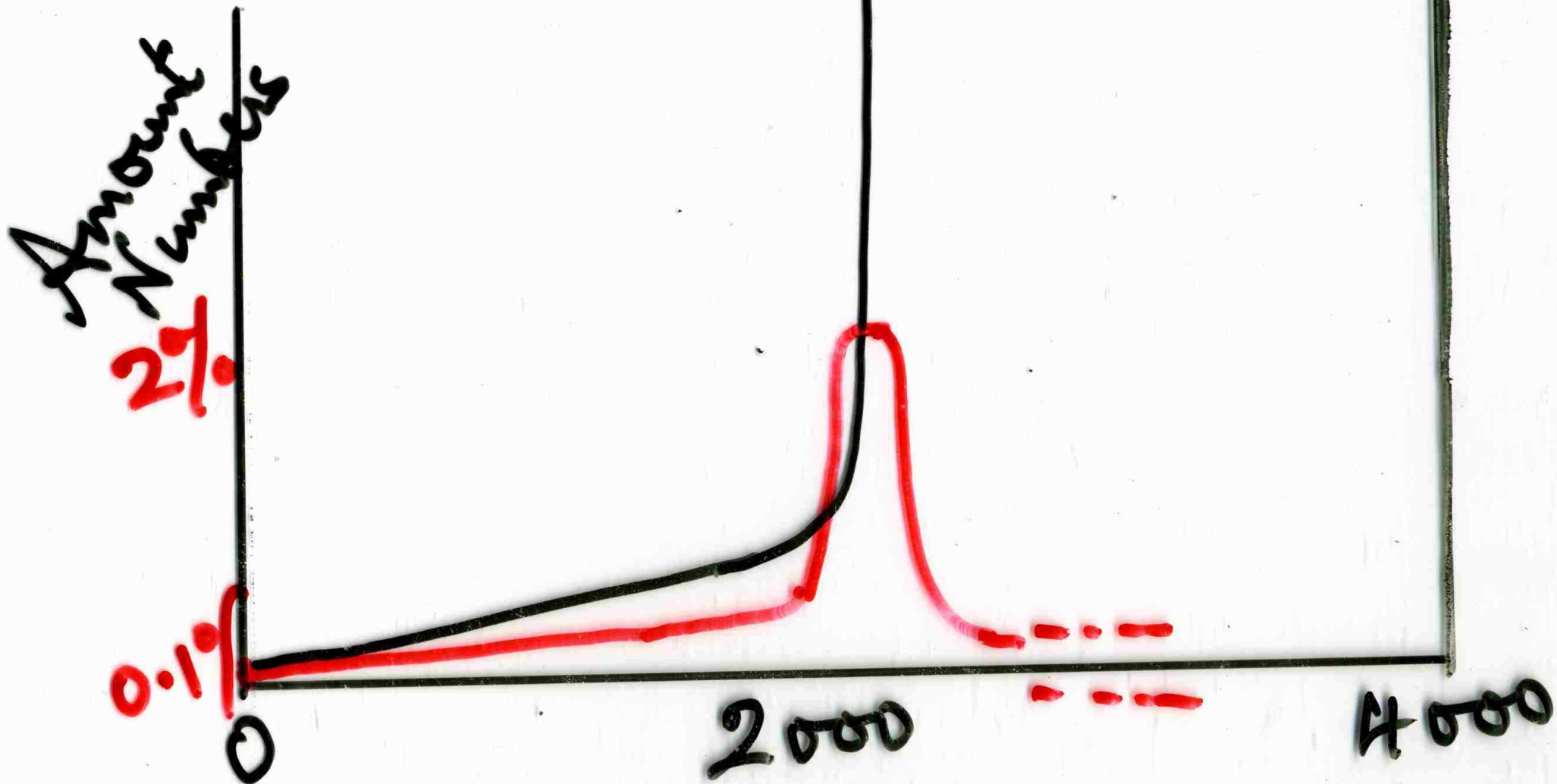
*"It is important to recognise, too, how tightly linked are the resources of soil, water and forest. Deforestation produces erosion and water pollution and makes run-off erratic, reducing the availability of water and causing more erosion. This process can become irreversible by altering the environment so drastically that reforestation is impossible." (Ehrlich, p278)*

What are the rates of change?

plot the rates on a time scale of 4000 years

from the birth of Christ to the same period into the future;

we see how population growth and use of fossil fuels is but a brief episode in human history; likewise most of the other changes.



**Quote:**

***"The most significant biological event of the present geological era has been the expansion of the human population from a modest and probably fairly stable size of a few million to several billions in only a few thousand years."***  
**(Ann Ehrlich. p395)**



**Sir Frank Fraser-Darling wrote in 1950, (quoted in Morton Boyd, 1986) that:  
"...The phenomenon of accelerating devastation and increasing population has, in effect,  
been inevitable from the moment man began to break ecological climaxes and upset equilibria without allowing them to rebuild..."**

**Most of us are not prepared to defer to this final logic, that the very achievement of humanness dooms us, and that civilisation is an ultimate contradiction."**

**Similarly, the Brundtland Report (1987) begins with the idea that:  
"Humanity's inability to fit its doings into this (nature's) pattern is changing planetary systems, fundamentally."**

**And then:**

**"The next few decades are crucial.**

**The time has come to break out of past patterns.**

**Attempts to maintain social and ecological stability through old approaches to development and environmental protection will increase instability.**

**Security must be sought through change."**

## Summary of Human Ecological Principles (Hardin 1985)

1. We can never do merely one thing.

2. No effects are truly side effects.

3. No system can long survive the effects of unopposed positive feedback.

4. Negative feedback can be a positive boon.

5. The "sanctity of life" must give way before the "sanctity of carrying capacity."

7. Not all elements of the human carrying capacity are expandable.

8. Population growth ultimately makes democracy impossible.

9. Selection dictates the direction of evolution.

10. Every biocide selects for its own failure.

11. Every human law selects for its own evasion.

12. No inning is the last inning.

## RENEWABLE

Ambient energy  
Biomasses  
eg forests  
soils  
fisheries  
biological products

Biological diversity  
if maintained

## NON-RENEWABLE

Fossil fuels  
Minerals  
metal ores etc  
lime  
phosphates

Biological diversity  
if destroyed

Environmental services  
Ecological controls for stability

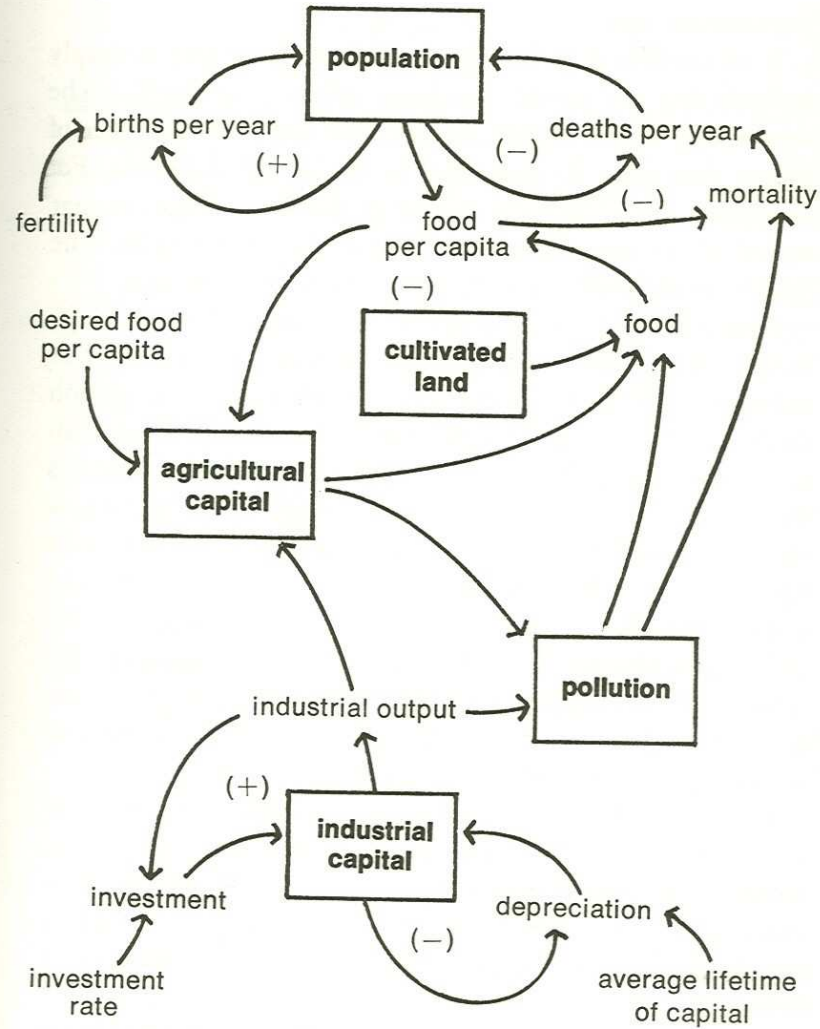
## NATURE

1. Driven by solar energy
2. Works in cycles
3. All materials are recycled, there is no waste
4. Competition and Co-operation in ecosystems
5. No great excesses
6. Increases biological diversity
7. Global stability
8. Multiple feed-back controls, mostly negative

## INDUSTRIAL MANKIND

- Driven mainly by stored fuel, fossil or biomass
- Works linearly
- Resources are consumed to waste
- Conquest by over-riding natural systems
- Large excesses
- Decreases diversity
- Global changes
- Little feed-back control, mostly positive

**Figure 24 FEEDBACK LOOPS OF POPULATION, CAPITAL, AGRICULTURE, AND POLLUTION**



*Some of the interconnections between population and industrial capital operate through agricultural capital, cultivated land, and pollution. Each arrow indicates a causal relationship, which may be immediate or delayed, large or small, positive or negative, depending on the assumptions included in each model run.*