# **Losing Control**

Viruses, bacteria & human reactions

a short presentation to the Anglo American Midhurst gathering

from B.J. Heinzen, September 1995

## **How Countries Grow**

Micro-economic activity



**Macro-economic policies** 

Seopolitics & economics seography

accidents

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

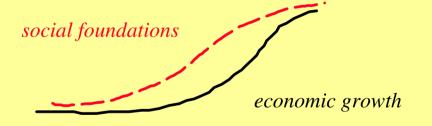
uck

Soft infrastructure:

financial systems, intellectual property rules, contracts, basic research

weather.

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



#### Capacity for political agreement & action:

-- think in terms of the whole population - think long term - create effective institutions

## The Age of Reason & Antibiotics

Isolate & identify

### **ENEMY GERMS**

Sanitation hygiene vaccines vectors

Neutralise & evade

#### **ENEMY GERMS**

Antibiotics Antifungals Poisons

Attack & destroy

1854: John Snow & the Broad St. pump

1880s: cholera 'germs' seen in a microscope

1944: first antibiotics

**ENEMY GERMS** 

Continued medical progress

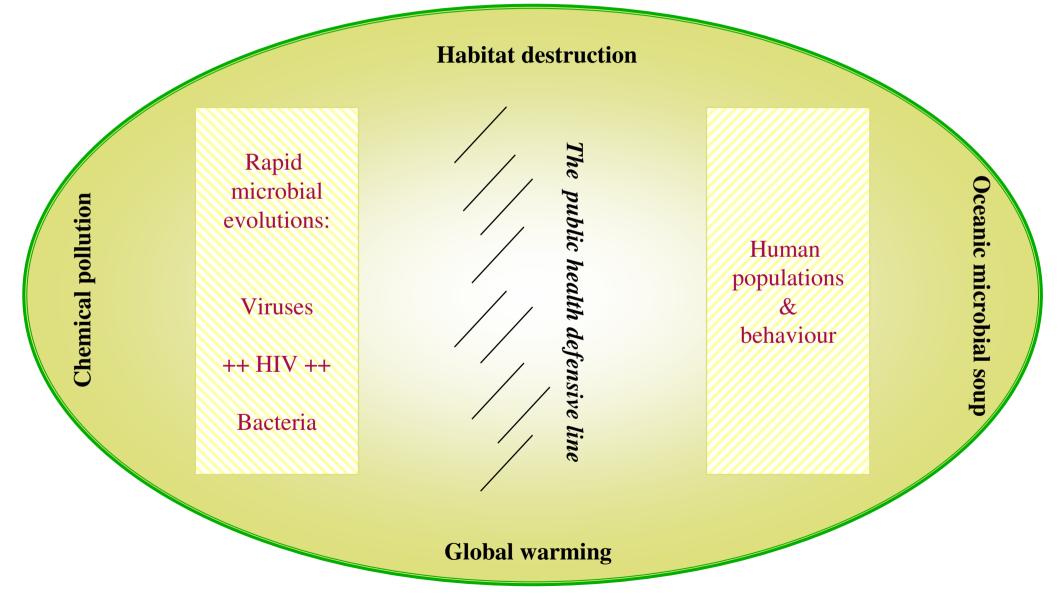
**ENEMY GERMS,** reduced to insignificance

"We'll never escape the limits of the ecosystem. We are caught in the food chain, whether we like it or not ..."

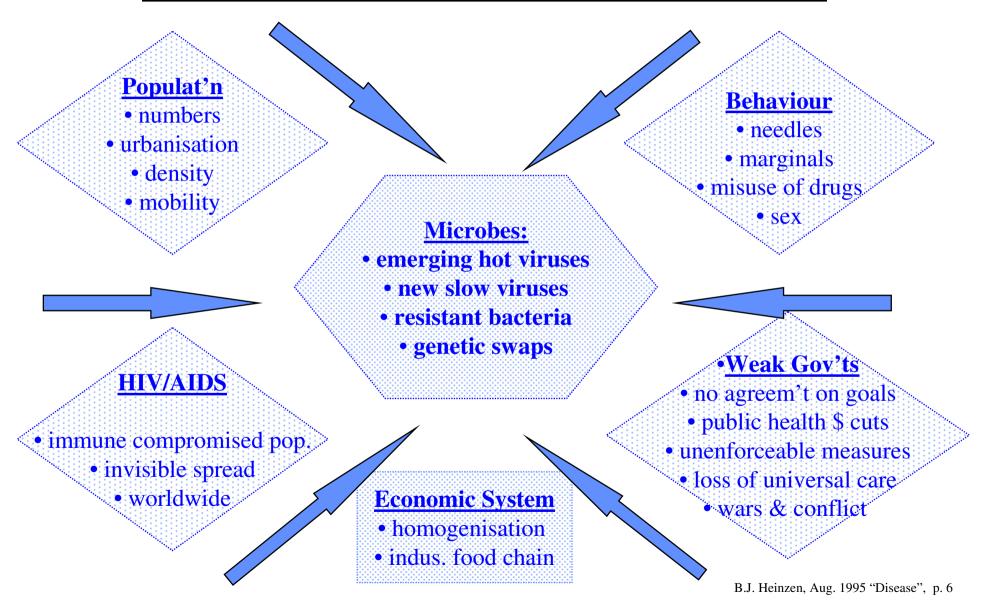
William McNeill, author of Plagues and Peoples

(quoted in *The Coming Plague* by Laurie Garrett, 1995)

# The Age of Complexity Begins



## A Rising Potential for Plagues



## In an Unbalanced Environment

#### **Habitat destruction**

- loss of biodiversity
  - cross species transmission of microbes

#### **Global warming**

- more microbes
- more vectors
- greater range of both



#### **Oceanic pollution**

human & chemical wastes create a mobile, microbial soup

#### **Chemical pollution**

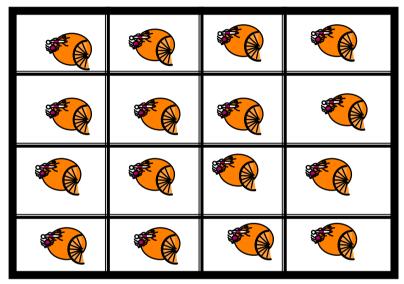
reduced resistance to disease among all species One rivet may be lost, and the plane won't crash. When many rivets fail, the plane goes down.

## **Malthus Revisited**

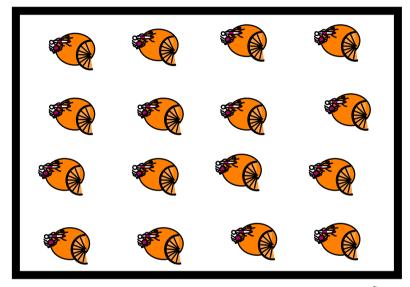


1958 Carl Huffaker, UC Berkeley

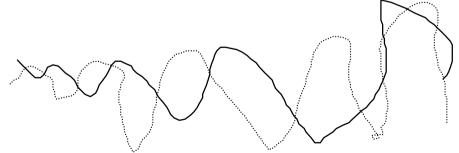
#### **Spatial Variability**



**Spatial Homogeneity** 

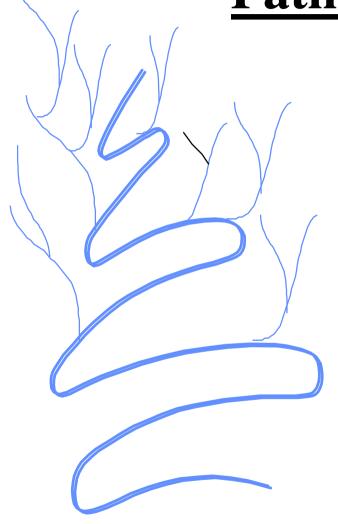


local extinctions, but systemic resilience



boom-bust of both populations to mutual extinction of all

## **Pathology of Control**



mg't more efficient
=> mg't more rigid
=>
eco-system less resilient
+
society more dependent
=>
more efficiency
+ more rigidity
+ less resilience
=>
!!FLOOD!!



Variability

Homogeneity

# "Plagues are as certain as death and taxes."

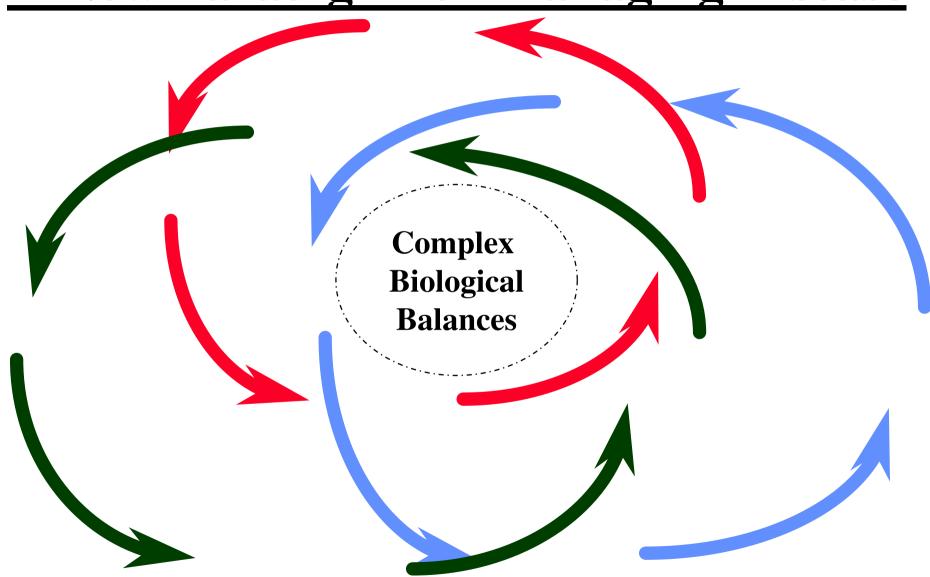
Dr Richard Krause, testifying before the US Congress, 1982

(quoted in *The Coming Plague* by Laurie Garrett, 1995)

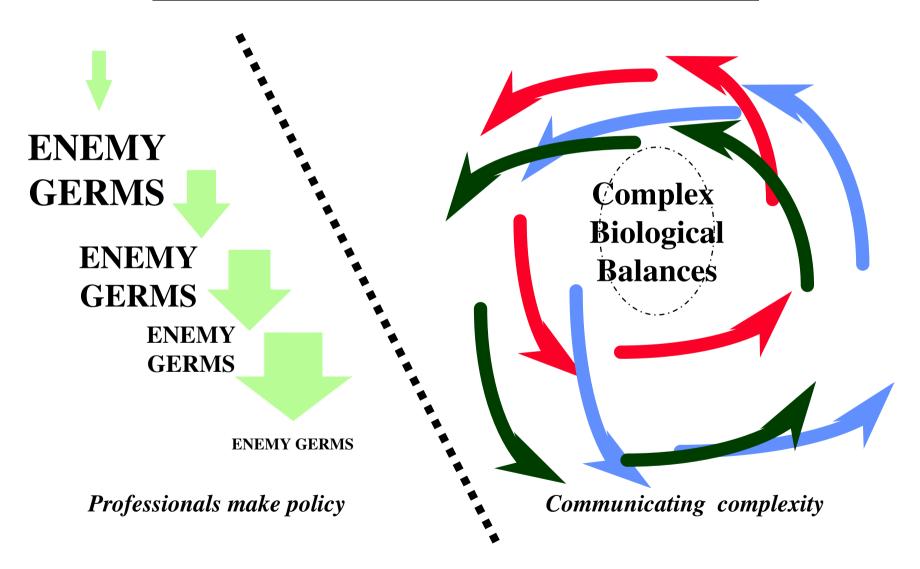
#### The Making of a Plague Rising Plague Potential **Existing HIV/AIDS** pandemic **IMPACT ON** New & old "hot" "HEALTHY" Weak governments diseases unable to **SOCIETIES?** anticipate & manage disease ++ *plus* increased travel & migration ++

chequered geography of serious epidemics

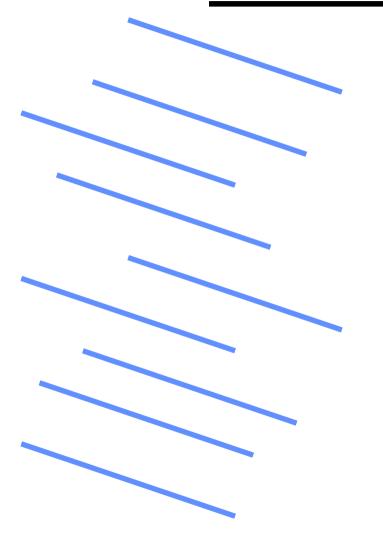
## A New Paradigm for Managing Disease



## The Need for New Tools



## The Defensive Line



#### **Public Health**

- •Basic & applied research Surveillance & epidemiology
  - •Disease "cowbows"
    - •Good nutrition
  - Clean water & air & soil
- Clean, uncrowded housing
  - Good clinics & hospitals
    - Effective drugs
    - Effective compliance

Will it hold?

## The Lesson of AIDS - Changing Behaviour

