Four spikes*

- Greenhouse gases
- Extinction
- Consumption
- Population

*Ed Ayres (1999, *God’s Last Offer*)

Through the bottleneck

- Greenhouse gases
- Extinction
- Consumption
- Population
- Interactions

*Endangered Earth*
Pessimism?

“There is no point to intellectual and political work if one were a pessimist. Intellectual and political work require, nay, demand, optimism.”*

Air pollution
Water pollution
Ozone depletion
Veal consumption


Greenhouse gases

**Outcomes**
- Temperature
- Precipitation
- Altered ecosystems

**Sources**
- CO₂—fossil fuels
- Methane
- CFCs
- NOₓ

**Solutions**
- Kyoto et al.
- Energy policy
- Individual actions
GH gases—individual actions

- Transportation
- Energy

1 gallon of gasoline ~ 40 acres of wheat*

*Jeffrey Dukes (2003, Climatic Change)

Extinction

**Outcomes**
- Reduced ecosystem services (valued at $33 trillion/year)
- Reduced inspiration
- Reduced flexibility
- Reduced beauty

**Drivers**
- Loss of habitat
- Ecological footprint
- Homogenization

**Solutions**
- $30 billion* (~70%)
- Individual actions

Extinction—individual actions

- Support conservation organizations
- Reduce ecological footprint (1% → 40%)
- Lifestyle change (as if lives depended on it)

Consumption

Consume:

1. To do away with completely; destroy
2a. To spend wastefully; squander
2b. Use up
3. To waste or burn away; perish
Consumption

Outcomes
- Intergenerational inequity
- Distinct social classes
- Economic “growth”

Drivers
- Neoclassical economics
- Marketing
- Human desire

Solutions
- Steady-state economy
- Shift subsidies
- Individual actions

Hard-wired for simplicity

Flight or fight (i.e., survival)

Procreation

Acquisition
Neoclassical economics

“It’s the economy, stupid”*

Goal of economic growth is never questioned

Positive discount rate devalues future

*James Carville (Clinton administration)

Consumption

**Outcomes**
- Intergenerational inequity
- Distinct social classes
- Economic growth

**Drivers**
- Neoclassical economics
- Human desires
- Marketing

**Solutions**
- Steady-state economy
- Shift subsidies
- Individual actions
Consumption

- Enough paved roads in U.S. to circle globe 157 times*
- U.S. military expenditures to protect Mideast oil: $30-60 billion/year*
- Value of Mideast oil: $20 billion*
- Water consumed by showering once/day for one year: 5,000 gal+
- Water required to grow one pound of beef in the U.S.: 2,600-5,000 gal+

* Lester Brown (2003, Plan B)
* John Robbins (2001, Food Revolution)

Consumption—shift subsidies

- Prices reflect total cost (e.g., gasoline > $9/gal)
- Stop subsidizing destructive practices
- Begin subsidizing constructive practices
Consumption—individual actions

- Reduce/Reuse/Recycle
- Think globally, eat locally
- Re-connect with nature

Human population

**Outcomes**

- Increased demands on ecosystem services
- Reduced quality of life
- Underlies other forces

**Drivers**

- Natural selection
- Individualist ethic
- Denial

**Solutions**

- Socioeconomic policies
- Revised worldview
- Individual actions
Denial?

Human population can grow “for the next 7 billion years”*  

*Myers & Simon (1994, Scarcity or Abundance: A Debate on the Environment)

The energy myth

Biosphere II – unlimited energy, human carrying capacity of 6-8*  

Global carrying capacity of 6-9 billion hard-working vegetarians  

*Odum and Odum (2001, A Prosperous Way Down)
Global food supply

*Worldwatch Institute (2003, Vital Signs)

Individualistic ethic

Formalized in our founding documents:

* e.g., unalienable right to life, liberty, and the pursuit of happiness
Human population

Outcomes
- Increased demands on ecosystem services
- Reduced quality of life
- Underlies other spikes

Drivers
- Natural selection
- Individualist ethic
- Denial

Solutions
- Socioeconomic policies
- Revised worldview
- Individual actions

Population—individual actions

- Minimize reproductive output
- Support alternative lifestyles
- Find community
Population—two paths

Stabilizing population

- Decrease fertility
- Increase mortality

Military expenditures*

U.S. expenditures, world needs*

Military: >$400 billion/yr

International aid: $10 billion/yr

Needed to reach basic social goals:
$62 billion/yr

- Education
- Nutrition
- Health care
- Reproductive services

* Lester Brown (2003, Plan B)

Envisioning the future

- Environmental protection
- Social justice
- Human economy
- Building design, livable space
- Conservation biologists
- Political scientists
- Sociologists
- Anthropologists
- Economists
- Environmental scientists
- Engineers
- Architects
- Urban planners
Envisioning the future

Suppose you had had the revolution …, and you had the kind of society you wanted. How would you live, you personally, in that society? Start living that way now! Whatever you would do then, do it now. When you run up against obstacles, people, or things that won’t let you live that way, then begin to think about how to get over or around or under that obstacle, or how to push it out of the way, and your politics will be concrete and practical.*