The Dynamic Planetary Context for Intentional Communities

By Dr. Robert Gilman

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I’ve never been more encouraged about the future than I am today.
System domains

Where are we in history?

Implications for intentional communities
- A system domain is a region in the system-context “map” where the system has a *characteristic set of behaviors*.

- The *behavior of a system* changes, sometimes dramatically, when it moves from one domain to another.
H$_2$O example

Three very different domains of behavior with sharp transitions between domains

0°C
- Solid

100°C
- Gas

Liquid
Home-heating example
Home-heating example
Home-heating example

The Context

$T_{\text{out}}$
Home-heating example

What's the relationship between the system and its context?
Home-heating example

Heater on
Heater goes on and off, controlled by thermostat
Heater off

T_{in} = 20^\circ C
T_{in} = T_{out}

T_{in} = T_{out} + 30^\circ C

Domain C
Domain JR
Domain H
Ecosystem example

- The system will be a forest
- The context includes sun, rain and soil
- We’ll start with bare ground and then watch the forest develop over time
Ecosystem example

- Ecosystem Biomass
- Time

Ecosystem Carrying Capacity

S-curve
Time-lags Allow Overshoot

- Carrying Capacity
- Overshoot
- Collapse

Growth

Time
Ecosystem example

Ecosystem Carrying Capacity

S-curve

Resource-limited Domain

Midpoint

Reproduction-limited Domain

Succession Species

Ecosystem Biomass

Time

Pioneer Species
## Success Strategies

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Pioneer</th>
<th>Succession</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resource Consumption</td>
<td>high</td>
<td>low</td>
</tr>
<tr>
<td>Resource Efficiency</td>
<td>low</td>
<td>high</td>
</tr>
<tr>
<td>Growth Rate</td>
<td>high</td>
<td>low</td>
</tr>
<tr>
<td>Longevity</td>
<td>short</td>
<td>long</td>
</tr>
<tr>
<td>Diversity</td>
<td>low</td>
<td>high</td>
</tr>
<tr>
<td>Complexity</td>
<td>low</td>
<td>high</td>
</tr>
<tr>
<td>Relationship With Others</td>
<td>isolated</td>
<td>cooperative</td>
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</table>
System Domains - Summary

- Created by *system-to-context* relationship
- Transitions can be *sharp* or *gradual*
- *System behavior changes across transition*, sometime dramatically
- If we know only one domain, we *can be misled* into thinking we understand the system (e.g. Newtonian physics)
- *Identifying* a system’s domains and transitions is *crucial* to fully understanding that system
System domains

Where are we in history?
Where are we in history?

Past 16,000+ years → 1900 to now → 21st century
World Population

Billions of People

Year

1900 1950 2000 2050

S-curve Midpoint

Succession Strategies

Pioneer Strategies
Humanity’s Ecological Footprint

1.5
1.0
0.5
0.0

Number of Earths Required

0.0
0.5
1.0
1.5

World Biocapacity

CO₂ from fossil fuels

“Full Earth” Approx. 1970

Food, Fiber & Timber

Built

1900 1950 2000 2050

Year
Limits-To-Growth Crisis

- Non-renewable resources (e.g. fossil fuels) are finite and get more costly to produce over time
- Renewable resources (e.g. fisheries, forests, topsoil, groundwater) have maximum sustainable yields
- Natural waste processing services (e.g. CO₂ absorption, water purification) have maximum sustainable loads
- We have overshot in all these areas but time-lags are delaying the full impact
World Population

Billions of People

Year

Earth's “Business As Usual” Carrying Capacity

S-curve Midpoint

Succession Strategies

Pioneer Strategies
Where are we in history?

Past 16,000+ years

1900 to now
Billions of People

World Population From 14,000 BCE

Earth's "Business As Usual" Carrying Capacity

Year

-14,000 -12,000 -10,000 -8,000 -6,000 -4,000 -2,000

Farming

First Cities

Rome

Renaissance

2,000
Outline of History

Cultural System Domains
Outline of History

Cultural System Transitions
Outline of History

3500 BCE

cities

now

Tribal

Empire

Planetary

farming

11,000 BCE

Renaissance

1500 CE

OUTLINE OF HISTORY

Tribal

Empire

? 

spring 1985 / in context 21
Outline of History

Tribal
- farming
  - 11,000 BCE

Empire
- Renaissance
  - 1500 CE

Planetary
- now

Prehistory
- writing

History

Past
- New Age
Outline of History

Tribal
- farming
  - 11,000 BCE

Empire
- Renaissance
  - 1500 CE

Planetary
- now

Prehistory
- writing

History
- Past
- New Age

Paleolithic
- Kinship-based

Agrarian
- State-based

Modern
# Cultural System-Domain Qualities

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<td>Kinship</td>
<td>Violence-enforced, Religiously-sanctioned Hierarchy</td>
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</tr>
<tr>
<td>Communications Level of Development</td>
<td>Oral Stories, Songs and Verse</td>
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How Shall We Discern The Future?

- Humanity’s track record isn’t good
- Hard to imagine beyond our domain
How Shall We Discern The Future?

- Humanity’s track record isn’t good
- Hard to imagine beyond our domain
- We need a strategy to look across the Empire-to-Planetary transition
- The strategy I’m using is to
  - look for analogous transitions in nature (e.g. pioneer to succession)
  - explore deep history from the perspective of cultural system domains in search of essential patterns that transcend any one domain
How We’ll Proceed

Tribal

11,000 BCE

farming

3500 BCE

cities

Empire

Renaissance

1500 CE

now

Planetary
# The Tribal-To-Empire Transition

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Lucky Latitudes For Agriculture

8,000 BCE

11,000 BCE

8,000 BCE
Global Climate Changes (Context)

Settlements

Domesticated Grains in Hilly Flanks

Domesticated Grains in China & Americas
Irreversible Transition to Agriculture

- Settlement
- Farming
- Population Growth
- Higher Energy Capture
- Over-Exploitation of Wild Plants & Animals
- Higher Population Density
- De-skilling
- Hard To Turn Back

De-skilling

Over-Exploitation of Wild Plants & Animals

Population Growth

Farming

Settlement

Higher Population Density

Higher Energy Capture

Hard To Turn Back

De-skilling
# Kinship To Hierarchy

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<td><strong>Main Livelihood</strong></td>
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<td>Initiated by climate change; maintained by more energy/capita &amp; /area</td>
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Scale Changes Social Dynamics

- Farming
- Personally Known Kin
- Clans
- Hierarchical Clans
- First Cities
Energy Capture Per Person

Energy Captured Per Capita (in kilocalories per day)

Year

First Cities
2.2 x

Farming
Energy Changes Social Dynamics

- More Captured Energy Per Person
  - More Division Of Labor
  - More Storable, Steal-able Surplus
  - Better Weapons And Fighters
  - More Motivation For Raids
  - More Violent Intergroup Conflict
  - More Militarization Of Communities
Empire Era Hierarchy

• Penetrates into all aspects of culture, e.g.
  ✴ adults over children
  ✴ men over women
  ✴ powerful men and women over others
  ✴ humans over nature
  ✴ mind or spirit over the body
  ✴ sky gods over everything

• This legacy is still powerfully with us
## Orality To Literacy

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Transition To Literacy

- Full literacy preceded by written numbers
- Much early writing focused on accounting and related record-keeping
- Literacy required enough division of labor and a large enough community to have multiple scribes; not surprisingly, it emerges along with the first cities (about 3200 BCE)
- Record-keeping enabled orderly control of large areas and populations; it was an essential complement to military force
Transition Timing

- Foraging to Agriculture
- Kinship to Hierarchy
- Orality to Literacy

Tribal Domain | Transition | Empire Domain
Lessons From The Transition

• The driving forces (e.g. improved agricultural yields, population growth) are gradual and unobtrusive

• Small changes can grow to irreversibility

• Changes in one part of the system can destabilize other parts, driving change throughout the system

• Powered by positive feedback loops, the changes progress until a new stable constellation of qualities is found

• Foraging, kinship and orality never go away; they just become secondary
The Empire Era

3500 BCE

Tribal

Empire

Renaissance

Planetary

now

farming

11,000 BCE

cities

1500 CE
Empire Era Characteristics

• Cultural system *domain* characterized by:
  ✴ Agriculture (>90% of population)
  ✴ Hierarchy (violence-enforced, religiously-sanctioned)
  ✴ Literacy (<10% of population)

• Its basic pattern remained stable for 4500 years (from 3000 BCE to 1500 CE)

• Nevertheless, there were some changes during the era ...
Largest Settlements

Inhabitants

Year

First Cities

Rome

Chang’an

Kaifeng

Hangzhou
Later Empire Era Inventions

- **Coal for smelting** (China) -1500
- **Horse saddle** (Eurasian nomads) -1000
- **Watermill** (Greeks) -500
- **Papermaking** (China) 1
- **Advanced mathematics** (Islamic & India) 500
- **Printing** (China) 1000
- **Gunpowder** (China) 1500
- **Compass** (China)
The Empire-To-Planetary Transition

- Tribal
  - farming
    - 11,000 BCE
- Empire
  - Renaissance
    - 1500 CE
- Planetary
  - 3500 BCE
  - cities
  - now
Innovation Seen As An Asset

• “Innovation” includes technological, social, economic, philosophical change

• Innovation has always been a factor
  ✴ Before Empire Era, too slow to be noticed
  ✴ During Empire Era, elites wary of innovation

• Europe best positioned to lead on using innovation (like Hilly Flanks was with agriculture)
  ✴ Multiple competing centers of power
  ✴ Knew that others (Greece, China, etc.) were more advanced; could learn from them
  ✴ Major initial success with warships
Innovation’s European Dynamics

Multiple Centers Of Power

Accelerates Europe's Advantage

Local Arms Race

Commerce Expands

Costs Increase Dependence On Commerce

Power Spreads To Commercial Elites

Dependence On Technological Superiority

Commerce Benefits From Tech Advances

Local Arms Race

Multiple Centers Of Power

Accelerates Europe's Advantage

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Costs Increase Dependence On Commerce

Commerce Expands

Power Spreads To Commercial Elites

Dependence On Technological Superiority
Innovation’s European Dynamics

Process Is Self-reinforcing

Religious, Political and Social Innovations Emerge

Deference To Old Elites Diminishes

Demand For Literacy Grows

Commercial Competition Drives More Innovation

Old Knowledge Authorities Undercut

Commerce Expands
## The Empire-To-Planetary Transition

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Worldwide Workforce

2007

- Agriculture: 36%
- Services: 41%
- Goods: 22%

Agriculture: 1,500 (90%)
Goods: 700 (22%)
Services: 780 (41%)

# The Empire-To-Planetary Transition

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Communications Level of Development

- Expansion of travel
- Expansion of literacy (now 84% worldwide)
- Increase in speed of communications
- Beyond language: multi-media, multi-sense
- Increase in person-to-person access
World Bank: 75% of humanity had access to a cellphone in 2012

Cellphone Subscriptions

Year


Percent of World Population

0 20 40 60 80 100

20% of humanity age 15 and older had smartphones by the start of 2013.
Almost a billion smartphones expected to be sold in 2013, exceeding feature-phone sales.
Communications Level of Development

• Expansion of travel
• Expansion of literacy
• Increase in speed
• Beyond language: multi-media, multi-sense
• Increase in person-to-person access
• Just as the Empire Era needed literacy to come into full form, so the Planetary Era needs the new electronic tools
### The Empire-To-Planetary Transition

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<td>Widespread electronic multi-media</td>
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More People Get More Choice

• Choice of
  * occupation
  * place of employment
  * political leaders
  * friends and associates
  * marriage partners
  * where to live
  * information sources
  * beliefs
  * goods and services

• All have increased dramatically in past 500 years, enabled by better communications, travel, trade and courageous pioneers

• Choice destroys the power of coercion
Two Responses To More Choice

• A shift to more indirect, covert and psychological methods of control
  ✴ Depends on control of the flow of information

• The growth of self-organized consensual collaboration on scales from personal to global
  ✴ This is analogous to the way nature organizes complexity -- through co-evolution and symbiosis
# The Empire-To-Planetary Transition

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<td>More people have more choice in their lives</td>
<td>Self-organizing consensual collaboration</td>
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We Are In A Different World

Billions of People

Year

-14,000 -12,000 -10,000 -8,000 -6,000 -4,000 -2,000 1 2,000

Earth's "Business As Usual" Carrying Capacity

Ecologically Full Earth, Communications Small World

Farming

First Cities

Renaissance

Rome
Time To Look Forward

Past 16,000+ years

1900 to now

21st century
Thinking About The Future

• The Empire Era is still strong in our minds
  ★ Language and beliefs
  ★ Ideas about human nature and how life works
  ★ Leads to misunderstandings and cognitive dissonance

• There will be surprises
  ★ Truth is stranger than fiction
  ★ Some things will turn out better than we expect, some things worse
  ★ Some things will just be totally unexpected

• Nevertheless, as long as we take system domains and transitions into account, the big picture is potentially discernible
The Planetary Era

- **Tribal**
  - Farming: 11,000 BCE
- **Empire**
  - Renaissance: 1500 CE
- **Planetary**
  - Cities: 3500 BCE
  - Now
Small World Meets Full Earth

How will the limits-to-growth crisis impact the Planetary Era qualities?

• Likely to spur yet more innovation
• Successful innovations will use succession species strategies
  * high levels of diversity
  * high levels of symbiosis (as in self-organizing consensual collaboration)
• Communications will be prioritized
• Sustainability needs to be added as the fourth domain-defining quality
Likely Changes To Come

• Every facet of culture will be affected
  ✴ Economics, governance, legal system, health care, education, religion, warfare, etc.

• Many of these changes will be resisted - visibly, stridently, even violently - by those who still identify with Empire Era values, but they will be on the wrong side of history and their apparent successes will not last.

• On the other hand, agriculture, command & control hierarchies and literacy won’t go away; they will just become secondary.
Planetary Era Characteristics

• Cultural system domain characterized by:
  ✴ Sustainability
  ✴ Diversity (occupations, interests, groups, etc.)
  ✴ Self-organization (from the personal to the global)
  ✴ Connectivity (worldwide peer-to-peer >80% of world population)

• It will be at ease with and foster innovation

• Human relationship at all scales (personal to global) will be fundamentally consensual
The Central Issue Of Our Times

It is not whether humanity or the earth will survive; we very likely will.

We will likely find our way through the limits-to-growth crisis and in doing so, complete the transition to the Planetary Era.

The issue is how graceful can the transition be? How much suffering can be avoided? How much long-term damage can be prevented?
What We Each Do Matters

• It has taken countless courageous choices by millions of people to get this far
• It will take countless more to complete the journey
• Alignment with succession strategies is the path to success
• With today’s communications, learning and innovation processes have accelerated
What Shall We Do?

- Let go of the Empire Era
- Step forward into the Planetary Era
- Do it all with compassion
- Innovate - Implement - Educate
Why I’m So Encouraged

• The momentum of history is moving towards a *cultural system domain* based on:
  * Sustainability, diversity, self-organization and connectivity
• The obstacles we face are human, cultural and solvable
• Even individuals and small groups can have a big impact through *innovate - implement - educate* if they are aligned with PE qualities
• People all over the planet are rising to the challenge and seizing the opportunity
System domains

Where are we in history?

Implications for intentional communities
Opportunities For Communities

• Many needed innovations are best developed in human-scale communities

• Innovative communities can enjoy the benefits of Planetary Era sooner

• They can also serve as sources of hope and experience for the wider world by being centers of research, demonstration and training
Suggestions For Communities

• Examine and clarify your own images of the past and future; how much are you stuck in Empire Era thinking or reactions against it?

• Expect the pace of change to be even greater during the next few decades; skate to where the puck will be

• Work with the flow of history; lead the way toward the emergence of the Planetary Era

• Innovate - Implement - Educate
I’ve never been more encouraged about the future than I am today.

Thank you.

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