INSTITUTIONS AND INSTITUTIONAL DESIGN

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Part IX: Evolution of institutions

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References

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- Gilels Deleuze and Félix Guattari “A Thousand Plateaus”, Minneapolis, University of Minnesota Press, 1987,
- Gintis, Herbert 2000 “Game Theory Evolving”, Princeton, Princeton University Press

Non-Linear History? Manuel de Landa 1997

Looking for generative macro-models

- In the dynamic of urban societies
  - Hierarchies and meshworks
- In the dynamic of the biosphere
  - Evolution, the probe head, the selector
- In the dynamic of languages
  - Constructing social institutions

Model I: Hierarchy

- Examples of it's simplest structure
  - Geology: rivers as sorting machines and sedimentation as consolidation (sedimentary rock)
  - Biology: genetic accumulation as sorting machine and reproductive isolation as consolidation (species)
  - Society: role differentiation as sorting machine and power institutionalisation as consolidation (classes)
- Basic processes: Sorting and Consolidation makes up the generative model diagram of hierarchy

Basic process I
(A machine diagram)

Hierarchy: a structure-generating process

1. Sorting of dissimilar elements into homogeneous groups
2. Cementing or consolidating the homogenous elements into a coherent entity with emergent properties

- The same basic process can be seen in the generation of rock, species, social classes, and languages

Process element:
Feedback - negative or positive

- Negative: deviation counteracting
- Positive: deviation amplifying

Affecting

- Heterogeneity
  - Localisation – different but homogeneous localities
  - Interweaving – similar but heterogeneous localities

Process element: Phase transitions - Bifurcations

- Slow accumulation of some substance may at some threshold trigger a radical reorganization of processes, changing the direction and/ or character of the processes radically rather than incrementally

Hierarchies vs. meshworks

- Urban development
  - Self-grown by decentralized decision making
  - Planned by centralized decision making
- Bureaucracy (hierarchy) vs. market (meshwork)
  - Markets imply bureaucracies (property rights)
  - Bureaucracies imply a political market where a stable sets of contracts are negotiated
- Explanations by means of “abstract machines”

Basic process II (a machine diagram)

Meshworks: self-consistent aggregates

- Articulation of super-positions of heterogeneous elements (dissimilar elements “mesh”)
- Intercalary elements as operators for the articulation (catalysts, intensifiers, densifiers, reinforcers, injectors, showerings, anything that brings about local articulation from within) aiding or creating autocatalysis of the elements
- The interlocked elements must endogenously generate stable behavioral patterns, exhibiting self-consistency

Meshworks: Self sustained dynamics

- Self sustaining dynamics
  - Catalyst's lock-in property makes it "mesh" with its key target changing the target's properties to become receptive to a third substance. The product of this reaction may serve as catalyst in another process producing the catalyst for the first. Thus together they produce a simple auto-catalytic loop
- Complex auto-catalytic loops
  - Links a series of mutually stimulating pairs into a structure that reproduces as a whole

Evolution of meshworks or complex autocatalytic loops

- Dynamic self-sustained systems are
  - Endogenously generating stable states (attractors, eigenstates)
  - Grow and evolve by drift. The chain may be extended as long as new nodes added to the mesh do not jeopardise the internal consistency. The loop becomes more complex but is still reproducing itself.

Examples

	Hierarchy **- consolidation**	**Meshwork** **- catalysis**
geology	Sandstone - sedimentation	Granite - crystallization
biology	Gene pool - isolation	Ecosystem - symbiosis
society	Social Classes - power distribution	Markets - money, norms

Evolution - the machine diagram

- Hierarchies and meshwork are found also in species and ecosystems
- The evolutionary dynamic (or the "probe head") of biological systems is a new machine
  - The variable replicator
  - The selector
- The same machine is also found in memes and genetic algorithms

Cultures and genes interact

- As sorting devices
- As constraints
- Cultural values becoming institutionalised may form a self-selecting dynamic enhancing or counteracting genetic adaptations
- Autonomy of culture may render some elements maladaptive relative to biological constraints

Types of cultural replicators

- Imitation (analogous to memes)
- Enforced repetition (adoption as norms or repetition as rules)
- Vertical flow
  - Parent to offspring
- Horizontal flow
  - One-to-one (person to person)
  - One-to-many (leader to follower)

Languages

- Replicators: sounds (vowels, consonants), semantic labels, syntactic patterns
- They are transmitted to offspring and new members as norms or social obligations
- Group pressures sort the replicators
- Other social processes “cement” them into more or less stable structures

Language: the machine diagram

- Statistical regularities of language use is transformed through standardisation into required constraints on combinations of words
- Requires norm enforcement, that is it requires a self-conscious group, with power over its members
- Douglas on group-grid dynamics generating different world views

Designing self-governing institutions: models of genesis

- Genesis of form from immanent causes
  - Such as phase transitions/ bifurcations
- Self-organising processes.
  - Such as attractors
- From here to there: the adjacently possible
- Norms, languages, rules and bureaucracies

Evolutionary dynamics
Herbert Gintis (2000:188-219) Ch 9

Some preliminaries from biology

- Strategies are held by species, not individuals
- By analogy cultures have strategies not individuals
- Instead of a Nash equilibrium, Meynard Smith uses the concept of an evolutionary stable strategy. A strategy is evolutionary stable if a population which is using it, cannot be invaded by a small group with a mutant genotype.
- A body of law may be seen as evolutionary stable, if no group of players have the power to change the body of law for their own benefit.

On history and evolution

- Meynard Smith introduces repeated random pairings of agents with particular strategies inherited from their genome. The history of the play does not matter in these biology games.
- But in culture history will matter.

The replicator dynamic

- A replicator is an entity capable of making approximate copies of itself. A replicator can be a gene, an organism, a strategy in a game, a belief, a technique, a convention, or a more general institutional form.
- A replicator system is a set of replicators in a particular environmental setting with a structured pattern of interaction among agents.

Evolutionary dynamic

- An evolutionary dynamic of a replicator system is a process of change over time in the frequency distribution of replicators (and in the nature of the environment and the structure of interaction), in which strategies with higher payoff reproduce faster in some appropriate sense.

Evolution of human societies

- When payoffs represent individual reproductive fitness, the replicator equation is a natural first cut at modelling evolutionary dynamics.
- But when payoffs are less directly related to reproductive fitness, as is usually the case in human cultural evolution, the replicator dynamic is rarely a plausible model of behavioural change.
- According to de Landa the model can be generalized (it applies to culture sui generis)

Human behaviour

- In many decision making and strategic settings people do not behave like the self-interested “rational” actor depicted in neo-classical economics and classical game theory
- But human behaviour can be modelled using game theory and optimisation subject to constraints
- There are plausible models of human cultural and genetic evolution that explain how we have gotten to be the way we are.
- Our models, however, can be improved considerably

Different rationality models

- Homo Economicus
- Homo Egualis
  - Inequality aversion
- Homo Reciprocans
  - Strong reciprocity: propensity to cooperate and share with others similarly disposed even at personal cost, and a willingness to punish those who violate cooperative and other social norms
- Homo Parochius
  - Discrimination between insiders vs. outsiders at a personal cost