



### 02. Contextualizing circularity in the architectural discourse

#### Non-linear Thinking

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As Einstein put it: 'So far as the theories ... are about reality, they are not certain; so far as they are certain, they are not about reality. Hence, not only do we need to adopt non-linearity as a major principle, we must also develop methodologies which do not take shortcuts through complexities.'

*Complexity and non-linearity* are near-synonyms. Another name for non-linear thinking is ecology. Before we list the virtues of non-linear thinking, let us briefly enumerate *the five fallacies of linear thinking*:

- *Closure*: Once established, systems are not open to outside influences or sources of energy or information.
- *Determinism*: The laws of linear systems function universally and cannot be broken. Effects are proportionate to, and can be accurately predicted from, their causes.
- *Reversibility*: The laws governing linear systems apply in both temporal directions, so that time appears to be inconsequential to them.
- *Equilibrium*: Forces and counterforces, as well as actions and reactions, tend to balance each other out.
- *Reductionism*: The whole is the sum of its parts.

Since the parts are not changed by their place in the whole, the whole can be reduced to the parts that comprise it.

Linearity is in fact very rare, except in flawed theories that are more often than not obsessed with mastery. Whereas these generic theories subsume occurrences under an a priori rule, a genetic theory always seeks the rule anew. To overcome the established culture obsessed with control and prediction we have to make way for creative thinking which does not take contingency as the mere opposite of necessity. Understanding chances and constraints as co-constitutive shifts the conceptual coordinates entirely from the a priori and axiomatic means-to-ends logic to an empirical attunement to ecological complexity. These are the *virtues of non-linear thinking*:

- *Openness*: Systems are open to outside influences or sources of energy or information. The point debunks essentialism which privileges intrinsic properties over and above the exteriority of relations.
- *Singularity*: There are no universal laws because they also evolve. Effects are not always proportionate to and cannot be accurately predicted from their causes. The general lesson of the logic of relation – eco-logic as opposed to ego-logic – is that the stable regularities we observe do not



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have specific causes which can be demarcated and isolated. They can only be understood as a dynamic unfolding of many processes operating over time.

- *Irreversibility*: Time is real. By real we mean irreversible and having real effects or consequences. Each thing perfectly expresses not only the state of its environment during a specific time interval, but also its own historical trajectory within it.

- *Metastability*: The finite and fixed extensive appearances conceal the intensive processes of becoming. Things are neither stable nor unstable, but metastable and forces do not act on objects, but on other forces.

- *Irreductionism*: Event and novelty cannot be subsumed under some general order because they are emergent properties.

Hence, *the whole is not of the parts, but alongside them and in addition to them*. The sciences have the tendency to reduce downward to the constitutive elements (atoms, quarks, strings), whereas the humanities have the tendency to reduce upward (ideology, politics, culture). Both micro and macro reductionisms are harmful.

To recapitulate, *in a linear system there is a correlation between input and output*. The greater the force, the greater the change. By contrast, *non-linear systems have no such simple one-to-one correlation*. A small cause can produce a great effect, or no effect, or variable effect, and so on. While the *ego-logic* endeavours to completely delimit its objects, the logic of intensities, or *eco-logic* is concerned only with the movement and

intensity of evolutive processes.

Process, which is to be counterposed to structure, seeks to grasp existence in the very act of its constitution. The ethical and political lesson of the logic of relation is that everything is contingently obligatory and not logically necessary. The exteriority of relations is not a principle, but a vital protest against a priori principles.