Difference and Robustness

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1. Introduction: from robustness to difference

2. The ontology of difference

3. Conclusions: the difference as the ontological basis of organisms robustness
1. Introduction: from robustness to difference

Robustness

Systems Robustness

Biosystems Robustness

Organisms Robustness (O.R.)

O.R. & Difference

Difference
2. The Ontology of Difference

2.1. Constitutive difference and comparative difference

2.2. The unity of differences in the final difference

2.3. The intelligibility of the final difference
2.1. Constitutive difference and comparative difference

- Aristotle’s Biology: a biology of differences

- Comparative differences: logical (*logikos*), static; it distinguishes, separates, compares, classifies; “A differs from B in this or that trait”

- Constitutive difference: physical (*physikos*), dynamic; it constitutes, develops, produces ontogenesis; “A differentiates itself”, “A follows a process of differentiation”

- Comparative differences are a byproduct of the constitutive

- But, an organism, constituted by differences, in plural, can still be a unique organism? There exists a final and unique difference?
2.2. The unity of differences in the final difference

- “The difference is the form in the matter” (Aristotle, *On the Parts of Animals*, 643a 24)

- Unity of matter and form (*Metaphysics*, VIII, 6; *On the Soul*, II, 1; *PA*, I)

- The constitutive difference is the organism itself

- But, could we know this individual form we call constitutive difference? Which is the relationship between *physis* and *logos*, i.e. between the constitutive difference and our concepts?
2.3. The intelligibility of the final difference

- A bridge from *physis* to *logos*?

- First attempt: The (failed) reform of definition
  - 1. Genera to one genus; 2. genus to species; 3. species to differences; 4. differences to the final difference
  - Dividing by the difference of the difference is impossible in real biological research

- Second attempt: Another way of knowing (*alle gnosis*)
  - Formal aspect of the constitutive difference
  - Difference/identity: mutual belonging (Heidegger: *Identity & Difference*"
  - Pluralistic approach (Sandra Mitchell’s Integrative Pluralism… and more)
  - Analogy, metaphor, prudence, practical truth, top-down causation, teleological stance… (Thomas Nagel: *Mind and Cosmos*)
3. Conclusions

- Organism development as a paradigmatic case of robustness (canalization)
- Organism develops its identity by means of a process of differentiation
- Difference/identity as the ontological basis for organism’s robustness
- Intelligibility of constitutive difference requires a pluralistic approach