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Some philosophical reflections on laws, principles and trends

On Laws, Principles and Trends

Overview

1. Altshullers Laws
2. Laws and Regularities
3. Laws of Development and Principles
4. Trends of Development and Evolution of Technical Systems.

Altshullers laws of development of technical systems

First group: Laws so that systems initially work at all

- [1] the law of completeness of the parts of a system
- [2] the law of „energy conductivity“ of the system
- [3] the law of harmonization of the rhythms of the parts of the system

Altshullers laws of development of technical systems

Second group: Laws in which direction functioning systems develop

[4] Law of increasing the degree of ideality of the system

[5] The law of uneven development of parts of a system

[6] The law of transition to a super-system

Altshullers laws of development of technical systems

Third group: laws on the higher level of development

[7] Transition from macro to micro level

[8] Increasing the S-Field involvement

On Laws and Regularities

Different meaning

- strict sense: Newtons mechanics (monothetic causality, cause and effect), in respect to predictability, prospectivity

Scientific laws or **laws of science: -** statements, based on repeated experiments or observations

- prediction of natural phenomena
- directly or indirectly based on empirical evidence

On Laws and Regularities

Laws as regularities:

- abstract generalizations of certain regularities of experience
- multirelational causality (reasons and goals)
- retrospectivity (you just have the effect and you can speculate on the causes, subjects/motives of action)

Laws of development and principles

Laws of development = regularities

- the logical structure is not nomological (not cause and effect)
- necessary to generate effective hypotheses
- Starting point: abduction
- putting empirical findings hypothetically into causal relationships
- based on *heuristic Principles, which are the foundations for Interpretation.*

Laws of development and principles

Heuristic principles in Interpretation:

1. Principle of subjective judgement/ personal assessment
2. Principle of the dependence on the mental environment
3. Principle of the organic-physiological foundations of mental processes

Laws of development and principles

Principles:

- simple
- not to be derived further preconditions for the connection of mental facts
- the most general principles are “the generally valid motives of human activity” (W. Wundt)

Laws of development and principles

Wundts Account on Psychical Causality

[1] The Principle of creative synthesis or of Creative Resultants (**Emergence-Principle**)

[2] The Principle of Relational Analysis and Relativity (**Context-Principle**)

[3] The Principle of Amplification of Contrasts and Development in Opposites (**Contrast Principle**)

[4] The Principle of the Heterogony of purposes (**of wanted and unwanted consequences**)

Laws of development and principles

Two basic problems:

[1] how to deal with laws as regularities

[2] how to theorize and model the dynamics of human activity

- focuses on problem of dynamics in general
- whats the problem of dynamics?

Trends of Development and Evolution of Technical Systems

strong interpretation of Evolutionprocess is reductive:

1. the onesided reduction to selection/ survival of the fittest.
   - ignores the fact of varieties or variabilities by chance
   - excludes some important other factors of evolution like mutation, rekombination and gendrift
2. the concept of adaptation as optimization
   - adaptation is not a teleological process, but the result of elimination (or sexual selection)
   - recognized in the retrospective way

Trends of Development and Evolution of Technical Systems

- the process of evolution is not linear and monocausal
- adaptation is not an active process
- Problem of dynamics: in combination of theorizing and modeling a non-linear and multicausal processes
- Problem of the evolution of systems is not the structure of the system, but the progression in the concept of evolution

Trends of Development and Evolution of Technical Systems

- Evolution as form of progress, which is more to be found in descriptions of chaotic processes and probabilistic accounts of fuzzy logic procedures
- philosophical problem: dialectics
- not limited to Hegel and Marx
- Altschuller: qualitative point in the use of dialectics
- big advantage: qualitative approach
- But: in means of development of technical systems and not of evolution

Trends of Development and Evolution of Technical Systems

- development as linear structure is clearly limited and rejected by Altshuller himself
- The concept of development was combined with the attempt of creating some qualitative views of trends, open for quantification
- Such quantification leads to (analytic) geometrical and cyclic views
- The representation of the lifelines of technical Systems in the concept of a S-Curve can be seen as an indirect solution
- But also as an indirect way to come back to a view of a linear way of progression

Discussion

- evolution of technical systems can be a promising addition and a way of sharpening and approving the possibilitiy of theorizing and modeling a technical system
- Problem of dynamics: more than fixing a law or finding a principle, but problem of engineering principal indescribable processes
- the possibility of standardized description is not only an approach for the ideal outcome, but also for ideal development, including contradictions

So the final question is, how this problem of dynamics can be catched and implemented?

Can the lifeline of a technical system be modelled in a chaotic and non-linear manner?