

LAWS – CATEGORIES – TRANSFORMATIONS

Abstract: The article presents the dialectical laws of Hegel as a particular case of a system of dialectical laws. Each of them can be graphically represented as an interaction between categories. The transition from one to another category by conversions can be represented. An original method for seeking a solution of problem at the level of basic conversions is demonstrated.

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Introduction

The purpose of the article is to present a model of the relations between the dialectical laws, polar categories and heuristic conversions.

The basic laws of the dialectic are: transition of quantity in quality, negation of the negation and unity and struggle of opposites according to Georg Wilhelm Friedrich Hegel. The law of unity and struggle of opposites draws together the laws for transition from quantity to quality and negation of the negation.

The law of unity and struggle of opposites can be summed up as a law for the unity and interaction of differences. In particular the interactions can be manifested as conflict (fighting) and the differences - as opposites.

The base pairs polar categories are: quantity-quality, regularity - fortuity, opportunity-reality, identity-difference and others.

Laws of the dialectics and categories

The law of unity and interaction of the differences can be represented as a transition from the meaning of a category in a meaning of the same or of another category:

In particular, the law of unity and interaction of the differences acts as a law of transition from quantitative accumulations in quality changes:

- Transition quantity - quality: qQ
- Transition quality - quantity: Qq
- Transition quantity - quantity: qq
- Transition quality - quality: QQ.

Many laws of transition from one to another polar category on the same principle can be formulated.

- Transition regularity – fortuity: RF
- Transition fortuity - regularity: FR
- Transition regularity - regularity: RR
- Transition fortuity - fortuity: FF

- Transition identity - difference: ID
- Transition difference - identity: DI

- Transition identity - identity: II
- Transition difference - difference: DD

- Transition reality - opportunity: ReO
- Transition opportunity - reality: ORe
- Transition reality - reality: ReRe
- Transition opportunity - opportunity: OO

The transitional processes in respect to other polar categories on this principle also can be formulated.

The law of negation to the negation NN can be seen as a special case of the following system of laws:

- Transition affirmation - negation: AN
- Transition negation - affirmation: NA
- Transition affirmation - affirmation: AA
- Transition negation - negation: NN.

ReO is expression of transitional process under fixed initial conditions.

ORe is expression of fading transitional process.

ReRe is expression of keeping of the character of transitional process.

OO is expression of changing of the character of transitional process.

The laws of negation and conformation characterize the dynamics of transitional processes.

In their essence all the laws of the dialectics as a transition from one to another polarity category or to the same category are presented. The base processes are associated with homeostasis, individual development and evolution. They form the following combinations:

A. Modification of the process of the same type:

- homeostasis → homeostasis,
- individual development → individual development.
- evolution → evolution.

B. Replacement of the type of process:

- homeostasis → individual development,
- individual development → homeostasis,
- individual development → evolution
- evolution → individual development,
- evolution → homeostasis,
- homeostasis → evolution.

Some polar categories belong simultaneously to two of the above classifications (table 1).

The printing of the consecutive application of dialectical laws, presented by basic categories is a means of identifying of the trend of this process and a prerequisite for its foresight. The process may involve different dialectical laws (for example: qQ, ReRe, Qq).

Table 1

Classification of groups of interconnected base pairs polar categories on the principle of *Yin-Yang*

<i>YIN</i>		<i>YANG</i>		<i>YANG</i>		<i>YIN</i>	
I Group: homeostasis → homeostasis				IV Group: homeostasis → homeostasis and homeostasis → individual development			
1	Peace	Movement		1	Reason	Consequence	
2	Reduction	Increasing		2	Coercion	Freedom	
3	Copy	Inversion		3	Restriction	Variety	
4	Symmetry	Asymmetry		4	Motivation	Realization	
5	Synchronicity	Asynchronicity		5	Ordination	Subordination	
6	Analogy	Difference		6	Entrance	Exit	
7	Good	Evil		7	Difference	Identity	
8	Frequency	Amplitude		8	Relativ	Absolute	
9	Fact	Opportunity		9	Indefiniteness	Definiteness	
10	Force	Speed		V Group: individual development → homeostasis			
Group II: individual development → individual development and individual development → evolution				1	Structure	Function	
				2	Internal	External	
1	Theory	Practice		3	Content	Form	
2	Random	Pattern		4	Essence	Phenomenon	
3	Perfect	Real		VI Group: → homeostasis homeostasis and individual development → evolution			
4	Abstract	Specifically		1	Quantity	Quality	
5	Copy	Original		2	Space	Time	
6	Sign	Information		VII Group: evolution → individual development			
Group III: evolution → evolution				1	Negation	Affirmation	
1	Nonexistence	Existence		2	Origination	Extinction	
2	Soul	Body		3	Birth	Death	
3	Consciousness	Matter		4	Start	End	
4	Desolation	Density		VIII Group: evolution → homeostasis and individual development → homeostasis			
5	Field	Substance		1	Development	Homeostasis	
6	Evolution	Revolution		2	Orderliness	Chaos	
7	Lower	Higher		3	Organization	Disorganization	
8	Symple	Complicated		4	Harmony	Disharmony	
9	Part	Entire		IX Group: homeostasis → evolution			
10	Element	Multitude		1	Faith	Knowledge	
11	Detachment	Consistency		2	Instability	Stability	
12	Subsystem	System		3	Periodical	Continuous	
13	Individual	Total		4	Level	Hierarchy	
14	Base	Upgrade					
15	Energy	Mass					
16	Relation	Condition					

The continued development of transitional process can be represented by the key categories that characterize it. They can belong to:

- a couple polar categories, alternating as a periodical process (for example: +Q – Q + Q - Q) or
- different pairs of polar categories (for example, by two pairs of polar categories Q1 and q2 may be a sequence: +Q1 -Q1 -q2 +q2).

The transition process between two categories can be programmed. For example, when you pass from the category "Peace" (table 1-I Group) to the category "Hierarchy" (table 1-XI Group) can form the following sample trajectories:

- Peace → movement (table 1-I Group) → Instability → Stability → Level → Hierarchy (table 1-IX Group).
- Peace → Fact → Opportunity (table 1-I Group) → Quantity → quality (table 1-VI Group) → Faith → Cognition → Hierarchy (table 1-IX Group).

The transition process between two categories can be represented by the Yin and Yang alternatives. They have projection in the basic laws of dialectics (table 2). Every law of the dialectic by different combinations of trends Yin and Yang can be represented. These trends through different categories can be realized (fig.1).

Table 2

Correspondences between Yin and Yang trends and basic laws of dialectics

Transition type	Basic trends	Transition type	Basic laws of the dialectics
YIN → YIN	Re	YIN → YIN → YIN	Re Re
		YIN → YIN → YANG	Re O
YIN → YANG	O	YIN → YANG → YIN	O O
		YIN → YANG → YANG	O Re
YANG → YANG	Re	YANG → YANG → YIN	Re O
		YANG → YANG → YANG	Re Re
YANG → YIN	O	YANG → YIN → YIN	O Re
		YANG → YIN → YANG	O O

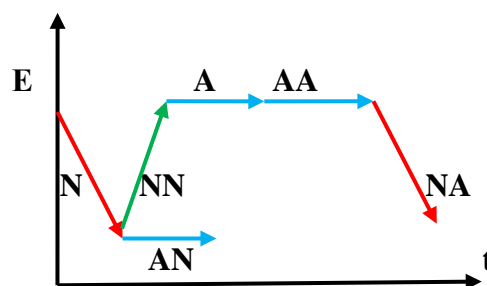


Fig. 1. Printing of processes: N - Negation, NN - Negation of the Negation, A - Affirmation, AA – Affirmation of the Affirmation, NA - Negation of the Affirmation, AN - Affirmation of the Negation in Evolutionary aspect E in terms of time t

Basic conversions and categories

Some of the categories are basic conversions. Most commonly used: birth, inversion, analogy, increase, decrease and others. The basic conversions may be used by the transition from one category to another one. For example:

- the transition Amount \rightarrow Quality can be realized by means of a conversion Increase
- the transition Birth \rightarrow Death can be realized by means of a conversion Invert
- the transition Element \rightarrow Individual can be realized by means of a conversion Analogy.
- the transition Simple \rightarrow Complicated can be realized by means of a conversion Development.

In general, the transition from one category to another one by a chain of conversions can be realized. For example: the transition Space \rightarrow Time may be specified: Space \rightarrow Form \rightarrow Difference \rightarrow Movement \rightarrow Time. The transition to the next category of this chain by means of a conversion Birth can be realized.

1050 technical heuristics and 5521 wisdom (including 2423 behavioral heuristics and 3198 situations) are analyzed. Two scales from basic conversions on this basis are identified: homeostasis and clearing up. Each of them includes 9 basic conversions. They are arranged alternately on polarity and transforming capability.

The complexity and the transforming ability of the conversions are growing in the periphery of these scales.

The conversions in the homeostasis scale (table 3) are aimed to modify priority the degree of deviation of an object from sustainability.

The conversions in the clearing up scale (table 4) are aimed to modify priority the degree of certainty of information that is needed for the search for a solution.

The conversions in the positive part of the scale are means for validation of concrete direction of the conversion of the set, i. e. they express the function of the law of the affirmation.

The conversions in the negative part of the scale are means for negation of concrete direction of the conversion of the set, i. e. they express the function of the law of the negation.

The basic conversions which form the transitional process have a different position in the homeostasis scale (table 3) or in the clearing up scale (table 4).

The set is the most common characteristic of a system. The entropy of a system is a stage of reaching of the limits of a particular process. The distribution of their values can be represented in scales.

The choice of corrective conversion can be illustrated by the scale of deviation from the desired set or the desired entropy of the system.

The scale includes 9 essential positions (fig. 2).

For example: the deviation from the desired value of equilibrium has an average value of -2. It is necessary to apply conversion $P = +3$ for correction of deviation -2 to the desired value +1.

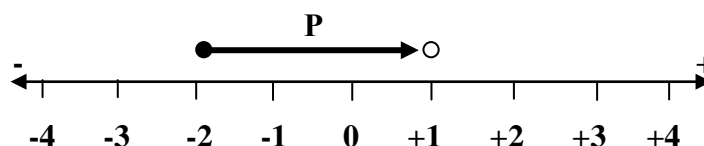


Fig. 2. Graphic illustration of the extent of the corrective conversion $P = +3$, applied on a deviation from equilibrium (level -2) of a system in order to stabilize it to degree +1

Table 3

Homeostasis scale

Deviation from equilibrium			Degree	Basic corrective conversions			Trend	
Type	Variation of entropy ΔH	Polarity		Polarity	Variation of entropy ΔH	Type		
Potential $\Delta H < 0$	maximum	+4	Maximum	-4	$\Delta H > 0$	maximum	LIQUIDATION	NEGATION
		+3	High	-3			EXCLUSION	
		+2	Average	-2			REMOVAL	
	minimum	+1	Low	-1		minimum	DIFFERENTIATION	
Balance		0	0	0			OFFSET	
Deficit $\Delta H > 0$	minimum	-1	Low	+1	$\Delta H < 0$	minimum	MERGER	AFFIRMATION
		-2	Average	+2			JOININGS	
		-3	High	+3			INCLUSION	
	maximum	-4	Maximum	+4		maximum	CREATE	

If the deviation from the desired value is related to a diversion of the sustainability of the system, then you can select for $P=+3$ basic conversion "Inclusion", for example turn on the power source to the system (table 3).

If the deviation from the desired value is related to the diversion of the definiteness of the information (which is associated with the process of seeking for a solution of specific problem situation), then from the table 4 can be fit for $P=+3$ basic conversion "Analogisation". For example: modeling of an uncertainty along the lines of another, that is with certain characteristics.

The number of conversions applied depends on the required accuracy of the solution.

If $P \geq 4$, then it is possible consistently to apply multiple elementary conversions with $P < 4$. After applying of each conversion, then analyse the need to apply next conversion.

The conversions, which are located close to the centre of homeostasis and clearing up scales, are relatively simpler and more specific in comparison with the peripherally located. That is why their use is preferable by the final clarification of the decision.

Table 4

Clearing up scale

Deviation of definiteness			Degree	Basic corrective conversions			Trend	
Type	Variation of entropy ΔH	Polarity		Polarity	Variation of entropy ΔH	Type		
Potential $\Delta H < 0$	maximum	+ 4	Maximum	- 4	$\Delta H > 0$	maximum	INVERSSION	NEGATION
		+ 3	High	- 3			REPLACEMENT	
		+ 2	Average	- 2			TRANSFORMATION	
	minimum	+ 1	Low	- 1		minimum	REDUCTION	
Balance		0		0			BALANCE	
Deficit $\Delta H > 0$	minimum	- 1	Low	+ 1	$\Delta H < 0$	minimum	INCREASE	AFFIRMATION
		- 2	Average	+ 2			ADAPTATION	
		- 3	High	+ 3			ANALOGI - SATION	
	maximum	- 4	Maximum	+ 4		maximum	COPY	

Conclusions

1. The process of searching for a solution may be specified in the trajectory: laws of the dialectics → categories → conversions.
2. The changing the laws of dialectics, categories or conversions may amend the basic factor in the process of searching for a solution.
3. The demand for a corrective conversion may be realized by homeostasis and clearing up scales of basic conversions.