

THE INVARIANTS OF THE SELFORGANIZATION IN THE
OBJECTIVE OF THE DIALECTICAL LOGIC

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The human projects which ignore the great laws of nature bring misfortune alone. The present-day reality fraught with the threat of ecologic collapse is regrettable illustration of this thought, which is going back to Heraclite yet.

The great laws of nature pointed out by the thinkers of the past are, first and foremost, the laws and principles of the dialectics which govern the world harmony and stability of its structures. The level of modern knowledge makes it possible to define them concretely in the methodological field of sinergetics which, being a bearer of an idea, plays the part of the scientific outlook.

The principle of splitting the entity is known to be the essence of the dialectics. Splitting of the entity into two measurable opposites, $E \rightarrow E_y + E_\mu$, is a general universal mechanism underlying structural genesis at all levels of matter organization.

The nature is full of the splitted entities, it is possible to say that the nature consists of these wholes everywhere: kinetic and potential energy, gravitations and electromagnetism, North and South poles, fauna and flora, eucariots and procariots, male and female of animals, poikilothermal and homiothermal organisms, regional and branchy sectors of the economy, basic and turnover funds, economically active and passive population, production sphere and service and so on.

How does the process of optimum proportioning of splitted entities-self-organization as self-harmonization in biological, geological, ecological, economic and other reality structures - is realized? The large scale of the entity (universum) may be taken as unity. Then, within its boundaries, the measures of the interacting opposites obey the conservation law: $\nu + \mu = 1$. By virtue of the internal connection of the entity, one of the measures is subordinate being the order parameter: $\nu = f(\mu)$. Such is the sinergetic reality of the splitted entities /1, p.61-62/. According

to Gegel, the law of measure development is the power laws /2, p.431/: $\sim \mu^1, \mu^2, \mu^3 \dots$. The combination of two relations gives the generator of invariants of the development and self-organization of natural systems: $\mu^k + \mu - 1 = 0$. For the integral powers, exactly such a situation obeys the simplicity principle and thus is alone taken into consideration, the development invariants or the knots of the linear measure accurate to the 3 decimal places are 0.500; 0.618; 0.682; 0.725; 0.755; 0.778; 0.797; 0.812... Being referred to as the generalized golded strong-point sections, they express the optimum proportion of the parts achieved by the whole or universum as a splitted entity in its self-organization process. These points are the attraction attractors of the integral characteristics of systems on the scale of their relative values.

The invariant values of the measure indicate a natural development process not burdened with pathology. The pathologic nature of this process and the state of the developing system might be judged about from one more evolutionary series: 0.570; 0.705; 0.741; 0.767; 0.788... It is produced by the same generator but with the power at a maximum distance from the integral values, i.e. $3/2, 5/2, 7/2 \dots$: $\mu^{n+1/2} + \mu - 1 = 0$. The values of the integral function of the whole equal to one of these "antiknots" or disharmony points at the scale of relations would indicate the degeneration or degradation, stress or climax, destructurization or disharmonization process undergone by the system. They are the pushing attractors.

From the point of view of a science we are interested in such splitted entities, which have universal all-theoretical sence and are at the same time the summarizing characteristics of the studying material. Such are the dynamic and stochastically laws of the universe, symmetry and asymmetry, order and chaos, uniformity and diversity. Entropia is used as the measure of chaos, disturbances, diversity. The redundance is the measure to organize the whole, the limitation of the diversity, "monolitically" structured material:

$$R = 1 + \sum_{i=1}^n p_i \log_n p_i$$

The Prigogin's principle works when there are states which are situated far from equilibrium, that is to say, when the densities of the structural components of the whole are equalized: $p_1 = p_2 = \dots = p_n = 1/n$. According to this principle the production

of entropia dH/dt in a given system, which is connected with the current value of the produced measure H , the other words, in computation per unity of the value this characteristic, production of entropia reaches minimum level just in the stationary states of the system:

$$\frac{d}{dt} \left(\frac{1}{H} \frac{dH}{dt} \right) = 0.$$

This, obviously, is valid for the redundancy too, the production of the redundancy reaches maximum level under this states. That is why the modules of both constants $\frac{1}{H} \frac{dH}{dt}$ and $\frac{1}{R} \frac{dR}{dt}$, according to the simplicity principle /3/, should be distinguished on the basis not more, than an integer multiplier. It is so, because the relative increase or changes in both measures should be commensurable with each other. This is the prerequisite of the harmonization of the components of the splitted entity. Here comes, that $H = R^k$. In the combination with the law of preservation $H + R = 1$ we have a equation: $R^k + R - 1 = 0$. The redundancy values, coinciding with one of invariants 0.500, 0.618, 0.682... characterising the organizational measure and lewell of limitation which is preserved in the variety system, show, that there is a structural harmony in the system. This harmony is more favourable for the full realization of its possibilities. The transition between such states is performed by a loop /4/.

Adducing the example we shall remark the words of J.Kasti: "When there are such parameters which make the systemic shift from one attractor to another the catastrophes take place" /5, p. 140/, and the words of Y.Demek: "The invariants which come one instead of another, are representing the stages of the evolutionary process" /6, p. 203/. It is known that biosphere here is selforganizing system.

Ex.: Chemical changes in the planet atmosphere (in parts of a unit) are the genetic reasons of the biosphere catastrophes:

Epoch*	Nitrogen	Oxygen	Argon	Carbon dioxide	Neon	Helium	R
A	0.67	0.32	0.008	0.002	0.00002	0.00001	0.618
B	0.74	0.25	0.008	0.002	0.00002	0.00001	0.654
C	0.78084	0.20948	0.00934	0.00031	0.00002	0.00001	0.683
D	0.81	0.18	0.01	0.09	0.00002	0.00001	0.705

*A - Mesozoic era; B - Transition period: Mesozoe-Cainozoe; C - Nowadays; D - Future forecast: the climax of Technogen.

The percentage of oxygen in the Mesozoic era (32%) was concluded according to the analysis of the air from the amber dated to 80 million years ago /7/. Both in the Mesozoic era and Nowadays there are correlating values of the measure of the organization R: 0.618 and 0.683 correspondingly. These states witness about the structural harmony of the whole. In the transition period after Mesozoic and before Cainozoic eras, there was, for an obvious reason, transference the measure R through the disharmony point 0.654. This fact can be confirmed by the amber specimens from the time horizons, at that very period the dinosaurs and the other giant reptiles died out.

As a result of burning of all resources of the organic fuel, extracted from the Earth, the oxygen percentage in the air may fall off to 18%. At that period the measure of the organization R reaches the point of disharmony 0.705 which is lying on the knot measure line. At that period there will be the climax of chaosogenity in the biosphere, new life conditions under which the animals couldn't survive. It is under the question too, if there will be a place for a man on the Earth.

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