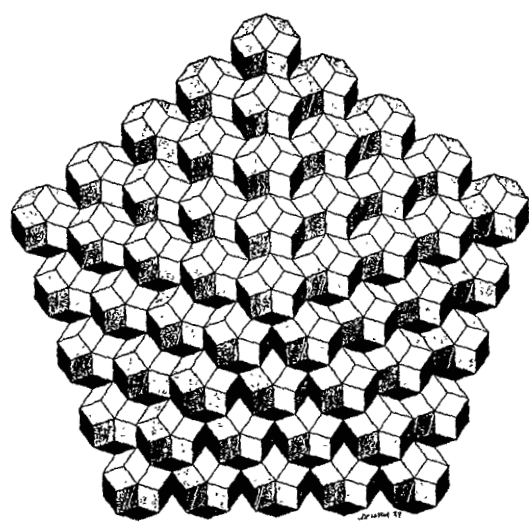# Symmetry
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Abstracts

II.

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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 thickers of the
past are, first and foremost, the laws and principles of the dia-
lectics which govern the world harmony and stability of its struc-
tures. 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 out-
look.

The principle of splitting the entity is known to be the es-
sense of the dialectics. Splitting of the entity into two measu-
rable opposites, $E \rightarrow E_\nu + E_\mu$, is a general universal mechanism
underlying structural genesis at all levels of matter organiza-
tion.

The nature is full of the splitted entities, it is possible
to say that the nature consists of these wholes everywhere: kyne-
tic and potential energy, gravitations and electromagnetism, North
and South poles, fauna and flora, eucariots and procariots, male
and female of animals, poikilotermal and homoiotermal 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 en-
tities-self-organization as self-harmonization in biological, ge-
ological, 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 inter-
acting 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 si-
nergetic reality of the splitted entities /1, p.61-62/. According

to Gegel, the law of measure development is the power laws /2, p.431/: $\vartheta \sim \mu^{1}, \mu^{2}, \mu^{3}$ ... 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 evolutional 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... : $\mu^{k+1/2} + \mu - 1 = 0$. 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 stochasticaly 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 matherial:

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

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: $p_1 = p_2 = \ldots = p_n = 1/n$. According to this principle the production

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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:

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

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 $\frac{I}{H}\frac{dH}{dt}$ and $\frac{I}{R}\frac{dR}{dt}$, 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 changles 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 loap /4/.

Adducing the example we shall remark the words of J.Kasti: "When there are such parameters which macke the systemic shift from oné 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

[x]A - Mesozoic era; B - Transition period: Mesozoe-Caino-
zoe; C - Nowadays; D - Future forcast: the climax of
Technogen.

The percentage of oxygen in the Mesozoic era (32%) was conclu-
ded 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 organizati-
on R: 0.618 and 0.683 correspondingly. These states witness about
the structural harmony of the whole. In the transition period af-
ter Mesozoic and before Cainozoic eras, there was, for an obvio-
us reason, transference the measure R through the disharmony po-
int 0.654. This fact can be confirmed by the amber specimens
from the time horizonts, 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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