

THE UNIFORM INTERRELATED SYMMETRIC PERIODIC SYSTEMS
OF FUNDAMENTAL STRUCTURAL ELEMENTS OF MATTER
AT FOUR SUCCESSIVE BASIC LEVELS
OF ITS NATURAL SELF-ORGANIZATION
(IN PHYSICS, CHEMISTRY, BIOLOGY, AND PSYCHOLOGY)

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There exist as little as $\gamma = 4$ successive basic levels of natural self-organization of matter, namely, the physical, chemical, biological, and human (social or, more strictly, psychological, i.e. intellectual, conscious) levels, i.e. $g = 0, 1, \dots, \gamma - 1$ or $g = 0, 1, 2, 3$ ($\gamma = 4$). They are in correspondence with the following four systems of all the possible (standard and derivative) fundamental structural elements of matter.

In physics ($g = 0$), a unified system of the fundamental elementary and subelementary particles and antiparticles of matter or, more strictly, protomatter of the type of leptons, quarks, and antiquarks of all generations starting from the standard electron generation (the spin-opposite, $S = \pm \frac{1}{2} \hbar$, electron neutrino and antineutrino, the charge-opposite, $Q = \pm e$, electron and antielectron, and the respective quarks and antiquarks of two species and three colour sorts) with the so called colour charge Q_c regarded as a proper differential qualitative internal characteristic D which, in the given maximum-symmetric basic case, takes on not only the particularly singled-out initial central zero eigenvalue $D(0) = 0$ but also none other than $S(0) - 1 = 6$ cyclicly-closed eigenvalues $D(d)$ ($d = 1, \dots, S(0) - 1$) equidistant from each other and from $D(0)$ and with the electric charge Q regarded as a proper integral quantitative external characteristic I which, in this case, takes on the same total number $I(0) = S(0) = 1 + 6 = 7$ successive eigenvalues $I(i) = \frac{1}{3} e i = 0, \pm \frac{1}{3} e, \pm \frac{2}{3} e, \pm e$ ($i = 0, \pm 1, \dots, \pm \frac{I(0)-1}{2}$).

In chemistry ($g = 1$), the complete periodic system of atoms or atomic chemical elements of matter or antimatter starting from the zero neutron or antineutron element and

all the remaining standard elements which define the structure of the system, i.e. complete all its periods including two anomalously-short initial periods (the single-element zero and two-element first periods), and are at the head of all the valent groups of the system or, at least, enter them as a part of the leading standard eight-element period (i.e. the second period), namely, n, H, He, Li, Be, B, C, N, O, F, Ne, Ar, Kr, Xe, Rn, Id (ideal, $Z = 118$). The subsequent periods and the cyclicly-closed valent groups of the system may be correlated with the respective uniformly-quantized eigenvalues $I(i) \sim i = 0, 1, \dots, L(1) - 1$ and $D(d)$ ($d = 0, 1, \dots, S(1) - 1$) of the proper universal characteristics I and D . In this case the total number of the successive periods $L(1)$ is the same as the total number of the respective cyclicly-closed valent groups $S(1)$ which is defined by the fact that, in this particular case, the respective cyclic closing $[P(1)]$ includes not only the nondegenerate regular six-member cycle $P(1)$, which is equivalent to its prototype in the initial case $[P(0)] = P(0)$, but also the simplest possible additional degenerate two-member initial cycle $p' = (D(0), D(1))$: $L(1) = S(1) = S_{[P(1)]} = S_{p'} + P(1) = S_{p'} + S_{P(1)} = 2 + S_{[P(0)]} = 2 + S_{P(0)} = 2 + 6 = 8$.

In biology ($g = 2$), a unified system of the fundamental elementary and subelementary molecular or, more strictly, submolecular bio-organic blocks of the type of standard genetically-encoded aminoacid residuals of all the possible biopolypeptides and the respective DNA desoxyribonucleosides and RNA ribonucleosides, which encode them genetically, for all the possible inhabited macrocosms. In the given case the proper universal characteristics I and D relate to the specific side radicals of the blocks and reduce to the number of the nonhydrogen atoms and ions or to their assortment, which take on the successive whole numerical eigenvalues $I(i) = i = 0, 1, \dots, L(2) - 1$ or, respectively, the cyclicly-closed eigenvalues $D(d)$ ($d = 0, 1, \dots, S(2) - 1$) equidistant from each other by one species of included or excluded atoms or ions every time. The number of either type of the eigenvalues is the same and is defined by the fact that the respective cyclic closing $[P(2)]$ includes not only

nondegenerate regular eight-member cycle $P(2)$, which is equivalent to the whole previous cyclic closing $[P(1)]$, but also two simplest possible additional degenerate two-member cycles p (the initial, p' , and final, p'' , cycles): $\iota(2) = S(2) = S[P(2)] = S_{p'} + P(2) + p'' = S_{p'} + S_{P(2)} + S_{p''} = 2 + S[P(1)] + 2 = 2 + 8 + 2 = 12$. The longitudinal skeletons of the blocks are of four types (allowing for the feature of the proline residual) and may be described by the proper spinal characteristic S with four pairwise-antisymmetric half-integer eigenvalues $S(\lambda) = \lambda = \pm \frac{1}{2}, \pm \frac{3}{2}$.

In psychology ($g = 3$), the complete system of typical homo sapiens with their 13 characteristic inverse values of critical levels of intellectual potentialities $1/x(i)$ or, in other words, with the appropriate successive whole numerical eigenvalues $I(i) = 12/x(i) = i = 0, 1, \dots, \iota(3) - 1$ ($\iota(3) = 13$) with the particularly singled-out common initial zero eigenvalue $I(0) = D(0) = 0$, which is inherent to the divinely-omnipotent genuises, at the center of symmetry of twelve remaining cyclicly-closed eigenvalues $D(d)$ ($d = 1, \dots, S(3) - 1$; $S(3) = 13$) constituting the complete closed nondegenerate regular twelve-member cycle $[P(3)] = P(3)$ which is characteristic of the proper mentality classification of typical homo sapiens and equivalent just to the previous cyclic closing $[P(2)]$, namely, $\iota(3) - 1 = S(3) - 1 = S[P(3)] = S_{P(3)} = S[P(2)] = 12$. The individuals with opposite traits (extraverts and introverts) are of sign-opposite half-integer eigenvalues of the proper spinal characteristic S , namely, $S(\lambda) = \lambda = \pm \frac{1}{2}$.

The above mentioned systems of the fundamental structural elements of matter at four successive basic levels of its natural self-organization are equivalent to the systems of uniformly-quantized eigenvalues of the respective universal characteristics I , D , and S which are of the same type of symmetry and are defined deductively from an appropriate mathematical induction. In each of the cases ($g = 0, 1, 2, 3$) the total number of so called standard elements (Σ^*) coincides identically with the total number $\Sigma = \iota + S + G$ of all the possible eigenvalues $I(i)$, $D(d)$, and $S(\lambda)$ realized by the standard elements:

$$\Sigma^*(g) = \Sigma(g) = \iota(g) + \varsigma(g) + \sigma(g) =$$

$$= \begin{cases} 7 + 7 + 2 = 16 & \text{at } g = 0, \\ 8 + 8 + 0 = 16 & \text{at } g = 1, \\ 12 + 12 + 4 = 28 & \text{at } g = 2, \\ 13 + 13 + 2 = 28 & \text{at } g = 3. \end{cases}$$

In principle, all these symmetrical periodic systems not only are determined by the proper dynamic laws of interaction, but also determine them themselves [1 - 8].

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