

Applied Value of the Fundamental Hypothesis of the Mechanism of Influence Regular Cosmogeophysical Oscillations on Hormone Secretion in Humans

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Introduction

Back in the late 20c. Japanese researchers found [1] extremely-low-frequency harmonics among electromagnetic waves on Earth surface. These harmonics are generated by mechanical oscillation of the Earth tides which periods lasts more than 12h. Also, solar X-rays ionize the atmosphere, and the tides cause many kilometer charged ionospheric layers to oscillate (a brandish of 4 km) [2], which generate electromagnetic waves with tidal periods. As skin-effect is absent relatively to such long periods, the penetration of these waves is several hundreds kilometers deep into the Earth and in near-Earth space. While there is no discussion, however human intuition rejects about their impact on humans organisms. But as life development on Earth lasted for millions of years at the presence of these waves, it is necessary to find an answer to this question: will any or not will dysfunction arise in the astronaut's endocrine system during their long time interplanetary flight being out of the range of natural electromagnetic extremely-low-frequency waves of Earth's surface? For space biology this question at the present stage should not be less actual than the radiation protection of astronauts, moreover that the technical means could be united to the counter threats.

In [3], based on calculations by the Monte Carlo mathematical statistics, 33 genealogical tree were analyzed (collected mainly in Armenia), having at least 23 people in each tree. As a result containing information on the dates of births in 1408 people, revealed incomplete randomness of distribution of birth dates among genetic relatives relatively the two well-known the-

ory of earth tides [4] long-period solar harmonics: Solar elliptical wave (S_a) with a period of anomalistic year (365.259640 days), Solar declination wave (S_{sa}) with a period of half of tropical year (182.621095 days), which means that the coherence of biological processes with cosmogeophysical oscillations. It is assumed that the presence of more preferred for the conception and birth of a child of time intervals is not related to genetics, i.e. with entries in the structure of DNA molecules, and due to regular cosmogeophysical phenomena. Based on the data taken from Yerevan (latitude 40°11' N) no certain results achieved about the impact on people's long-period lunar harmonics: Lunar elliptic wave (M_m) with a period of anomalistic months (27.554551 days), Lunar declinational wave (M_p) with a period of a half tropical month (13.660791 days); and periods having important significance in the theory of earth tides: the synodic month (29.530588 days), half of the synodic month (14.765294 days) (time interval between new moons and full moons, as well as variations) evection (31.812 days) [4].

Existing the largest amplitude Principal semidiurnal lunar (M_2 with a period of 12 h 25 min) and Principal semidiurnal solar (S_2 with a period of 12 h) waves [5] modulate multi-daily earth tide's waves (S_a , S_{sa} , M_m , M_p). The superposition of action of the lunar (M_2) and solar (S_2) waves represents the beatings, which occur when two waves have a small relative difference between the periods (25 min). The sum of waves is maximum when the vectors of attraction of the Moon and the Sun have the collinear direction, i.e. at syzygies – new moons and full moons.

A hypothesis exists about regular cosmogeophysical oscillations influence' mechanism on hormone secretion in the humans' organisms [6], based on the change in electrochemical properties of water [7], which consists in living organisms: the

experiment taken place in Moscow (at latitude 55°45' N.) showed the influence of the M_f wave. From geophysics it is known that long-period tides give the greatest fluctuations in the level surface at the poles, half as low at the equator and zero at latitudes $\pm 35.3^\circ$ [8]. Therefore, not exclusively the weakness of detection (reliability of 0.88, not 0.99) of the influence of the lunar wave M_f in a sample of genealogical trees collected in Armenia, can be explained that latitude of Yerevan is near to 35.3° N. Thus, searching multi-daily lunar waves M_m and M_f influences on the people at the latitude of Moscow is much advisable. It is known, that an external electric field is the phenomenon of electro-permeabilization, cells are released from larger molecules through formed pores in the membranes. So, maybe, there are important variations in the body's endocrine system in the intensity of secretion of hormones, including gonadal (reproductive) hormonal axis [9], providing the secretion of sex hormones (testosterone in men), responsible together with the formation of hidden rhythms not only for reproductive function but also for the working abilities and volitional qualities of the person (astronaut).

Applied value of that fundamental hypothesis could be used for the steps to maintain the health of astronauts during their interplanetary flights in future. It is important to achieve certainty with respect to the biotropic role of extremely-low-frequency weak-intensive waves of natural electromagnetic background in order to determine the need and technical feasibility of their modeling on board the spacecraft, since it is necessary to take into account the hardware complexity of the generation of extremely-low frequencies. The value of the fundamental hypotheses is also in that, as statistical analyses of birth dates for representatives from several generation in genealogical tree reveals the impact of the waves with the periods of heavenly bodies movement across its orbit, so this indicates the existence in the biology, besides known genetically (based on DNA molecules), also not known the science non-genetically form heritage, coming from strictly defined results of calculations connected with impact very-low-frequency electromagnetic waves having cosmogeophysical nature. The name "declinational" (lat. De-clino – deviating from a vertical direction) in relation to the six-month-old solar wave (S_{sa}), appeared thanks to Copernicus, who advanced the theory of the heliocentric system of the world and the rotation of the Earth around its axis. This wave arises because the axis of rotation of the Earth is inclined 23.5° to the perpendicular to the ecliptic plane (the plane of the Earth's orbit around the Sun), because of which the axis of rotation of the Earth during the year describes a cone relative to the perpendicular to the direction to the Sun and in the northern and southern

hemispheres the seasons change. And the name of the annual solar elliptical wave (S_a) points to Kepler's First Law on the ellipticity of planetary orbits. Thus, the discoveries made centuries ago by Copernicus and Kepler regarding the motion of celestial bodies are also reflected in the biology of organisms (humans) living on the Earth.

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