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On Research History of "Cosmophysical Explanation of Main Catastrophic Events That Took Place in Geological Past"

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Abstract: The issue of cosmic catastrophic influence upon the Earth needs to be considered by the comparison of two independent, to a certain extent, factors. The first one, cosmophysical, must contain physical basis for the reality of reasons and the main mechanisms of such events impetus. The second one, geological, must provide proofs that the cosmic catastrophic influence upon the Earth in the geological past did take place. This report deals with the both trends but the main focus is on cosmophysical aspect.

Key words: Cosmophysical explanation, main catastrophic events, geological past, aspect, independent

INTRODUCTION

The basis for cosmogenesis comprehension is the concept of correlated and interdependent origin of chemical elements (atoms) and satellites planets around stars (CCAPF-Concept of Correlated and Interdependent Atoms and Planets Formation).

The cosmophysical aspect of the problem under consideration is tightly connected with the laws of Solar System formation. The theoretical core for physical understanding of these processes is the conception of correlated development of chemical elements periods and satellite planets (CCAPF) which was suggested by the researcher in 1943-1945. The main point of that conception is the recognition of the fact that the appearance of all chemical elements originates within stars, including the Sun and proceeds as a cyclic process at which the formation of each elements period is completed by an explosion and outburst of a nova (the Sun) and throwing of atomic substance into its vicinity. This substance later serves to form a new satellite planet. The concept can be treated as a statement of one of the basic Nature laws (the law of correlated origin of chemical elements periods and star satellites atoms).

MATERIALS AND METHODS

The application of the CCAPF to the model of a single star (the Sun) development and its results. Hypotheses 1-3 (Khodkov, 1986, 2013): For >40 year, the solar system was considered by the researcher as a single star-the Sun-evolving. Its history was considered as a number of consequent astronomic time cycles of atoms and planets formation. Though, hypotesis 1 was made long ago, in 1943-1945, it did not receive any recognition. Hypothesis 1 found some other contradictory facts. One of the main shortcomings is that hypothesis 1 did not get its numerical expression and for more than 40 years it was only a qualitative construction.

Despite all this, hypothesis 1 played its important part in solving the problem of catastrophic influences of space factors upon the Earth. As long as, according to Hypothesis 1, after the formation of the Earth, the Sun created two more planets and hence it exploded twice, so the Earth had to Witness and Withstand Thermo-Percussive Influence of the Sun Star Explosive Wave (TPIEWS)-hypothesis 2. The search of reflecting signs of those two influences upon the Earth have been attracting the researcher's attention for >40 year (Salop, 1982).

Mechanical parameters of the Solar System as a demonstration of the Sun-Jupiter double-star role in its history: The Solar System is heterogeneous and formed at different time. The intuitive conviction in the correctness of the CCAPF as a statement of the cosmogenesis main law demanded the contradictions between its conclusions and above mentioned dissenting facts were solved. Those contradictions were solved by means of Solar System mechanical parameters analysis which was carried by M.G. Vinogradova in the process of our joint work started in 1987. The structure and values of the Earth type planets rotation in comparison to mechanical parameters of its own revolutions and circulation around a star, as it was found, cannot belong

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to the system of the single evolving star of the Sun but it reflects the existence and interaction of two stars. It became evident that the assumption of the Sun as a single star does not allow to solve the problem of the Solar System origin (Khodkov, 1986). The explanation of the origin as well as of the known mechanical parameters of planets rotation may only be provided if we assume that the Solar System developed according to Newton's gravity law for entire stars family. It was proved that the basis of the Solar System origin theory should include the following statements:

- The CCAPF of correlated and interdependent cyclic development of chemical elements periods within the stars and the derivative star satellite that is proceeding as a sequence of evolutional periods with explosions accompanied by substance rejection
- The postulate on velocity constancy of neutrons increment to the evolving atomic nucleus
- The principle of the essential difference between the evolving constituents of star system and the derivatives of their evolution. The evolving constituents considerably alter in their radii, mass and mechanical parameters of their own rotation after another loss of exploding shell while their derivatives are incapable to do it
- The statements following from Roche's law on the fact that the combined parallel development of close binary star two systems may be accompanied by capture of the one star evolution derivatives by another star
- The last two Thermo-Percussive Influences of the Sun Explosive Wave (TPIEW) upon Earth took place 0.22 and 2.0 bln. year ago

With the help of above mentioned thesis M.G. Vinogradova fulfilled some structure analyses of mechanical parameters of Solar System components motion which with sufficient certainty enabled to reveal their genetic nature and outline the main peculiarities of the Solar System formation. Here, we will speak about the final conclusions about the Solar System origin and influence of the TPIEW upon Earth (Table 1).

The most common summary is that our Solar System is heterogeneous and of different age, it is a combination of derivatives that came into existence at different times and made their own way of development. It is known that the Solar System contains one active star, i.e., the Sun. Besides, it contains a number of faded stars which made their way of development cycle according to the CCAPF law: Jupiter, Saturn, Uranus, Neptune. All those celestial bodies are gravitationally dependent on the Sun which is the central body they all circulate around. Among the satellite planets circulating around the Sun, only Mercury and Venus were originated by the Sun. The rest are either faded stars finished their evolution or the derivatives of Jupiter, that were captured by the Sun, namely Earth and Mars. Derivative-satellites of faded stars circulate around them as well as satellites of another origin. Our Moon, as a derivative of the Sun evolution, after the completion of the third period synthesis had circulated around its paternal star in the past but later on, it was captured by the Jupiter derivative, i.e., Earth and then they took their place on circumsolar orbit as a double-planet. Since Earth was formed after the formation of the chemical elements sixth period, first, it had no atoms of seventh period. Those elements were brought to Earth by explosive wave from Jupiter 3.3 bln. years ago after the formation of the chemical elements seventh period and emergence of Amalthea satellite (Khodkov, 2013).

Table 1: The stages of Sun and Jupiter development in time intervals of chemical elements periods synthesis corresponding to Mendeleev periodic table (Jupiter: columns 1-4, Earth: 6-8)

Completely formed synthesis period	Duration of rotation cycle	The body-derivatives of synthesis process	Substance density (g/cm^3)	Age of thrown covers (bln. years)	Completely formed period of synthesis	The body-derivatives of synthesis process	Substance density (g/cm^3)
	Jupiter	lighted up	-	12	-	-	-
1	400h 32m	Callisto	1.7-1.8	11.9	-	-	-
2	171h 43m	Hanimed	1.9	11.5	-	-	-
3	85 h 14 m	Europe	2.99	10.8	-	-	-
4	42 h 27 m	Io	3.52	9.5	-	-	-
5	24 h 37 m	Mars	3.95	8	-	-	-
6	18-19 h	Earth	5.52	5.2	-	-	-
-	-	-	-	5.2	Sun	lighted up	-
-	-	-	-	5.0-5.1	1	Unknown	X
-	-	-	-	4.5	2	c-asteroids	2.2
-	-	-	-	3.7	3	the Moon	3.34
7	11 h 57 m	Amalthea	X	3.3	-	-	-
-	-	-	-	2.0	4	Venus	4.95
-	-	-	-	1.1	-	Mercury	5.3
-	-	-	-	0.22	5	Vulcan (according to Le Verrier)	X

Generally, the history of the Solar System is represented as a history of development of the close multiple star system that evolved partly consequently, partly simultaneously according to the CCAPF law, beginning with the moment of their origin about 15 bln. year ago. The last stage of Solar System development is considerably related to the evolution of the Jupiter-Sun double-star system. At this stage, Jupiter produced two of seven derivative satellites: Earth and Amalthea (Table 1). And the Sun produced three of five derivatives: the Moon, C-asteroids ring and the first satellite probably ruined or captured by another star. Venus and Mercury were originated by the Sun under conditions of a single star. The last one, Vulcan, still could not be found due to insufficient time passed since its formation (0.22 bln. years) but its existence was predicted by calculations of astronomer Le Verrier (Khodkov, 2013).

Two essential peculiarities can be especially highlighted within the mechanism of the Solar System formation. The first one is the formation of derivative satellites, small and dark cosmic bodies adjacent to active stars (evolving stage according to the CCAPF law) from substance of the shells, thrown during the explosive. The space of location of these satellites is determined by the sphere of distribution of the star shell substance, thrown by the star during its burst and further capable of accretion into independent body of satellite. The second one is gravitational keeping together of a star family, their derivatives and other bodies dependent on the major influence of the last appeared and the most massive star as a center of the system. Only due to the necessary interaction of two above mentioned reasons (CCAPF and the peculiar organizing, combining and keeping functions of Newton's gravitational forces), the star-planetary systems are being formed in the universe. This law seems to be universal for the whole cosmos. Besides, it is obvious that all the main restructuring processes within the Solar planetary system mainly belong to the moments of star explosions; during the stationary period, the conservation law for all the mechanical parameters of the system predominates. Merely when the stars explode, the changes of mechanical parameters may take place due to the alteration of synthesis conditions balance within the star (Khodkov, 1986).

RESULTS AND DISCUSSION

The new Cosmogonic Theory-a new n trend in Science: The conception elaborated by the researcher together with M.G. Vinogradova can as well be called a New Cosmogonic Theory (NCT). Hypothesis 1 is a pure hypothesis. The NCT by Khodkov-Vinogradova is a very harmonious theory. It can be proved by the fact that all the above mentioned discrepancies of the hypothesis 1 (H_1) between geological and astronomical factors have no place in the NCT (Table 1 and 2). Including: instead of nine periods of chemical elements, as in H-I, according to the NCT, there are seven thereof as in reality. H_1 defines the Earth's age as 3.6 bln. years maximum while the NCT provides another value: 5.2 bln. years for age of thrown down 6th Jupiter shell. There is any longer no need in the deduction that now the Sun is forming the tenth period of chemical elements. According to NCT, the origination process of the 6th period chemical elements

Table 2: The comparison of the dates of the terrestrial development main stages (megacycles) with the dates of the thermo-percussive influence of Sun and Jupiter's explosive waves events determined by means of the New Cosmogonic theory

Megacycle (bln. years ago)	Stage (Era)	Stages of development	Diastrophism (mln. years ago)	Space events
0.22-0			227-Pacific or Cimmerian	The origin of Vulcan, future planet
PHZ The Phanerozoic	VI	Platform-geosyncline with increase of tectonic movements speed and amplitudesand noticeable growth of earthy crustheterogeneity	650 Katang 1 730 Luffilian	
EP The Epiprotozoic 2.0-1.0	V	Platform-geosyncline adult stage (stable platforms)	1000 Greenville 1200 Avsian 1375 Kibarian 1630 Vyborg 1730 Pargouas	The origin of the Mercury
1.9-2.0			1925-1975-Karelian	The origin of Venus
MP The Mesoprotozoic	IV	Platform-geosyncline beginning	2175 Ladoga	
2.8-2.0		stage (of labile platforms)	2400 Seletsk	
			2630-2775-Kenoran	The origin of M-asteroids
PP The Paleoprotozoic 3.7-2.8	III	Protoplatform-protogeosyncline (the stage of green-stone belts)	2975 Barberton 3175 Swaziland	
			3330 Belingwic 3550-Saamian-II	The origin of Amalthea 3.7/3.5
			3700- Saamian-I	The origin of the Moon
KA Katarchean 4.7-3.7	II	Permobile (the stage of universal tectonical earth's crust mobility)	4000 Gothobic 4500	The origin of c-asteroids and c-planet
Pregeological 5.2-4.7	I	Protoplanetary	5100	The origin of solar planet X

takes place now on the Sun. Taking into account all the mentioned factors, there is no need to consider the Sun as a star that stopped its evolution. It occupies its proper place in the Herzsprung-Russel diagram which meets the requirements of the NCT. The NCT is confirmed by a number of astronomic factors. The main one is the gradual increase of substance density of derivative satellites produced by Jupiter and the Sun (Table 1). This increase directly reflects the growth of the most heavy elements content in younger satellites. This phenomenon cannot be an accidental one (Khodkov, 1986).

The one important proof of the NCT correctness is the revealing among the planets rotating around the Sun two different in their origin groups: star derivatives originated according the CCAPF law and celestial bodies which are former stars and which coexist within the Solar System due to the inherited location of their origin. It should be noted that the idea of the Jupiter group "planets" as faded stars was suggested previously. We can add that many factual data and ideas used in the NCT are well known and were proposed long ago. The NCT completely complies with the well-known Herzsprung-Russel spectrum-luminosity diagram and the seven main star's spectral classes which can be distinguished in it. We are convinced in total and specific compliance of the NCT with the modern astronomic science achievements. There is no need to determine that the NCT is an undoubtedly new concept because of its foundation on new physical principles and discovered phenomenon (CCAPF, TPIEW, etc.). Also, it uses a new, never used before, method of the Solar System mechanical parameters deciphering, like in apparatus of genetic analysis of stellar derivatives. It is interesting that no one of the astronomers who studied the celestial mechanics, did an analysis of the Solar System mechanical parameters similar to the one conducted by M.G. Vinogradova.

The new cosmogonic theory and the problem of catastrophic cosmic influence upon the earth (its lithosphere): The NCT is a result of wide generalizations and interpolations that seem to be far from one another in space, time and in the course of the matter physical processes and phenomena taking place in Nature. The periodicity of chemical elements forming is compared with the recurrence of satellite formation within small star systems. Our (let's call it Big) Solar System comprise of Small or own star-planetary systems including the Sun, Jupiter, Saturn, Uranus, Neptune. Explosions ("nova" type bursts) of stars affect the satellites as TPIEWS. TPIEWS effects upon the Earth were accompanied by global tectonic re-structuring of its lithosphere. Conversely, the widespread correlation methodology allows to extrapolate retrospectively the revealed by means of extrapolation geological past dependencies. In the NCT, this was done on the basis of the registered TPIEWS moments with the formation of Jupiter and Sun satellites (after origin of the Earth) with regard to the discovery of ultra-tectonic (diastrophic) traces of the past events. Using Table 1, it is easy to make a conclusion that after the origin of the Earth, at a distance astronomically not very far from it, according to the NCT, several starbursts happened. Regarding the time, they took place (billion years ago) 1- 5.0/5.1; 2- 4.5; 3- 3.7/3.5; 4- 1.9/2.0; 5- 0.22. For the last two explosions, the dates defined by radiometric method were taken and ultra-tectonic events compared with them are the boundaries between the lower and the upper Proterozoic periods and between Paleozoic and Mesozoic periods. The first boundary (1.9-2.0 bln. years ago) is related to colossal re-structuring of the earth's crust. The second one (0.22 bln. years ago) is referred by the author to the moment of the Pacific Ocean cavity formation. The dates of earlier TPIEWS events effects upon the Earth obtained by the calculations made as per the NCT Method. Let make the following remarks prior to beginning the comparison of the TPIEWS events dates by the NCT and geological determination of the events time, identification of the likeness and comparability degree of astronomical and ultra-tectonic dates of the events, considered as TPIEW traces that took place on Earth. It is quite possible that the traces of starbursts at the early period of the Earth's history, even if they caused by strong TPIEWS upon the Earth are very hard to find it, but later events, dated by the moment of the Moon origin (3.7 bln. years ago) and especially of Venus (1.9-2.0 bln. years ago) are to be precisely diagnosed in the lithosphere. The geological identification of the last two TPIEWS effect upon Earth, as it was mentioned before, definitely serves as a factual basis for the definition of absolute time of chemical elements periods formation and also the age of the Sun, Jupiter and their derivative satellites.

It is essential, that, from the point of view of hypothesis 3 (the "Terrestrial theory" taking into account the TPIEWS effect upon Earth), the largest global-scale geological tectonic events must be divided in two groups: the direct consequences of the TPIEWS and other cosmic events, that are affecting whole Earth simultaneously; events taking place irregularly as if according to a flexible schedule and related to the faults of continental blocks, lateral shift of their separate parts, their collisions and formation of plicative mountain structures. Thus, when we raise a question of correspondence of the starbursts and TPIEWS effects upon the Earth with the factually defined moments of ultra-tectonic deformation (diastrophisms),

Table 3: Strength energy of dipoles bond in atoms of group 8 elements

Period number			Structure numbers			Complement of radicate	
(1)	Element (2)	Dipoles number (3)	4-dipoles planar (4)	6-dipoles spatial (5)	Bond energy, A.M.U.Atomic mass minus dipoles number (6)	Total ν (7)	Per 1 dipole ν/dipole (8)
1	He	4	1	-	4.0026-4 = 0.0026	3	3/4
2	Ne	20	5	-	20.17-20 = 0.17	202	10
3	Ar	36	9	6	39.94-36 = 3.94	4684	130
4	Kr	72	18	12	83.80-72 = 11.80	14030	195
5	xe	108	27	18	131.3-108 = 23.30	27705	256
6	Rn	172	43	-	222-172 = 50	59453	346
7	?	?					

only one part of the total fixed number, that is coincident with the starbursts time and be explained as a sequence of TPIEWS should be taken into account.

The age of probable catastrophic space influences of TPIEWS type that can be compared to large-scale diastrophism breaches on Earth, defined according to the NCT. Our task now, of course, must become the comparison of mentioned age moments with diastrophisms dates, that are defined by geological methods. We should start with the selection of the geological comparison scale.

There are plenty of works presenting the of the geological events dates of the past. In the majority of cases, there are the compilation works and more often considering the Phanerozoic Eon. We concluded that the most valuable is the work by L.J. Salop named (translated) "Geological development of Earth in the Precambrian" (Salop, 1982) because it gives the most comprehensive and well-reasoned information on the age of the largest diastrophisms. L.J. Salop is an outstanding specialist in the Precambrian, he wrote a number of articles and books. The above mentioned work generalizes various facts of the Precambrian history in Russia and abroad. Since, the Precambrian period of the geological history took approximately nine tenth of the whole age of Earth, of course, we must look for the traces of cosmic catastrophes within its bounds. In line with other scientists, L.J. Salop dates the main turning point in the geological history to 3700-3500 mln. years ago which corresponds with the transition from the Katarchean to the Protozoic. The Saamian tectonic diastrophism corresponds with this boundary: Table 2 presents the coincidence of the TPIEWS date, referred by the NCT to the origin of the Moon. The Karelian diastrophism, pointed out by Salop as the one terminated the Mesoprothozoic Era 2000-1900 mln years ago, related by the NCT to the origin of Venus. The date 4.7 bln. years ago connected to the boundary between pregeological and geological stages of terrestrial history (Vinogradova and Scopich, 2014; Vinogradova and Vinogradov, 2015). The date of the planet X origin (5.1-5.0 bln. years) is not stated, perhaps because the TPIEWS traces on the early stage of terrestrial development could leave no sign due to the high mobility of the upper layers of geosphere. The Canary diastrophism boundary (2.8-2.6 bln. years), separating the Paleoprotozoic period from the Mesoprotozoic (or the Archean Eon from the Proterozoic), can presumably be compared to the moment of the medium flash of the Sun and formation of M-asteroids*. The origin of the Mercury can be referred to Greenville diastrophism boundary (1.1-1.0 bln. years) finishing the Epiprotozoic period (Table 3).

Hence, five of the first order diastrophisms defined by L.J. Salop and one determined by the author (0.22 bln. years, Pacific or Cimmerian) can be compared to the TPIEWS from the Sun and Jupiter. Belingwic diastrophism (3.3bln. years ago) originated Jupiter satellite can be referred to the presumable collision between the Moon and the Earth (Vinogradova, 2016).

There is no doubt that the coincidence of 6 geologically defined dates (five of them are investigated by Salop) of the largest terrestrial diastrophisms with the dates for TPIEWS determined by the NCT is another important proof of the correctness of the New Cosmogonic Theory. For the objective NCT assessment, it is no less important to determine the cosmogenesis stages and their assignment to star evolving process.

CONCLUSION

General conclusions of the geological science made during the last decade helped the author to choose two main border lines in the tectonic history of the Earth: the first at the boundary between the upper and lower proterozoic periods (1.9-2.0 bln. years ago) and the second at the boundary between the Permian and Trias periods (0.22 bln. years ago). Taking into consideration the TPIEWS significance for Earth, the author, in 1986, elaborated the main thesis of the new development theory of Earth and the Earth's crust-hypothesis 3. The last hypothesis is meant to be the most important component of the fundamental theory of Earth formation (Khodkov, 1986).

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