THE AURIC TIME SCALE AND THE MAYAN FACTOR

or

Demography, Seismicity And History Of Great Revelations In The Light Of The Solar-Planetary Synchronism

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The world is one and indivisible. But what can present its unity in number, or specify the community (or synchronism) between such fundamental features of this Universe as periods of planetary revolutions and 11-year Solar activity cycle, trends in demography and the Mayan Calendar, the epochs of coming of Great Teachers of humanity, not speaking about geological, economical and other cycles in Nature and society?

As it turns out, the historical structure of all these phenomena is synchronized by the Golden section number $\boldsymbol{\Phi = 1.618\ 033\ 9\ldots}$ (or by ***Fibonacci series***, as its integer presentation) and the average period $\boldsymbol{T_0 = 11.07}$ ***(years)*** of 11-year Solar activity cycles.

This synchronism is described with the use of rather simple object – the Auric series, viz. a geometrical progression $\boldsymbol{F} = \{\ldots \Phi^{-2}, \Phi^{-1}, \Phi^0 = 1, \Phi^1, \Phi^2, \ldots\}$ being infinite to both ends, the unit $\Phi^0 = \boldsymbol{1}$ of which corresponds to the Earthy year, or to T_0. For this series, the terms Φ^k, $2 \cdot \Phi^k$ correspond [6] to most known basic periods in Nature and society (from biology to geology, including economical cycles), and in this sense the series $\boldsymbol{F}$ defines the *Scale of the basic phenomena periods*. From the other hand, it specifies an exponential structuring of time in a form of sequence of intervals with duration decreasing in the Golden section, and in this sense the series $\boldsymbol{F}$ specifies the *Scale of evolutional time*.

In elaboration of previously established synchronism of periods (viz. Scale of basic periods in Nature and society), the forcible arguments are obtained to consider the Auric Time Scale as specifying the structure of global processes in dynamic, or "absolute" time, as well.

This miraculous historical synchronism being quite exactly specified both by the Auric structure of the Mayan Calendar and 2000-year trend in population of China, and by prominent historical events and geophysical cataclysms has allowed to put forward some *forecasts for the forthcoming decade and a half*, as well as to *correct the date of expiring of the Mayan Calendar* being associated with prominent changes in all spheres of life.

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Introduction

Revealing of cyclic processes in Nature and society, as well as determining of their periods and initial points for spiritual, scientific and applied purposes are attracting attention of a man since the ancient times. At this, such basic properties of Time as periodicity and succession-of-events were always close, but not equivalent.

These days, we may only imagine we can qualify with confidence the entire system of the ancient knowledge, including count of time, as the most things were enciphered, and unveiling even some of them makes us astonished. Thus, as the cuneiform tablets show, the *Ancient Babylonians were watching the phases of Venus*, which became possible for modern astronomy only after invention of telescope in the XVII century. Not less admiration is provoked by the Mayan Calendar the Auric structure of which is studied below; though it has almost nothing in common with Solar and Lunar cycles which make the basis of the most calendars, the *Ancient Maya knew the duration of the average Solar year with several digits after the decimal point*, their concept of counting the days is now accepted in astronomy (Julian days), and *their Calendar for Venus was accurate to within two hours per 500 years!* That is why we may suggest this calendar to hide some more secrets of Time.

Revealing of cyclic processes in Nature and society is commonly carried out by detecting the basic period T of the phenomenon, which is preferably considered to be immutable, though sometimes harmonics are considered, viz. the periods kT and T/n where k and n are integers or rational numbers. Once these basic periods specifying the phenomena of various nature have been detected, we may state a problem of studying of synchronism between them. For this, in [6] the concept of Solar-planetary synchronism (SPS) was introduced.

In the narrow sense, the SPS is understood as a mathematical description (or system) that correlates the periods of the Solar system planetary revolutions, Solar rotation and average period of 11-year Solar activity cycle. It was found that this system behaves itself algebraically as if its structure consists of, at least, two components: harmonic (or linear) and exponential (or nonlinear) ones. At this,

the first of them specifies time in a conventional uniform scale where the Earthy (e.g. tropical) year is taken for the unit, with respective derived units from seconds to centuries and millennium;

the second, or the Auric Time/period Scale (ATS), presents the infinite discrete set of periods $\boldsymbol{F} = \{\ldots \Phi^{-2}, \Phi^{-1}, \Phi^{0}=1, \Phi^{1}, \Phi^{2}, \ldots\}$, viz. the geometrical progression with the ratio being equal to the Golden section number $\boldsymbol{\Phi = 1.618\,033\,9}\ldots$; its unit, $\Phi^{0}=\boldsymbol{1}$, might be set up to any physical period (tropical year, average 11-year Solar activity cycle period, etc.) belonging to the system. This selection of time unit specifies the absolute value of periods relative to the chosen unit-period, though it does not influence the synchronism.

In the broad sense, the SPS denotes coincidence of the periods specified by the Auric Time Scales $\boldsymbol{\Phi^{k}}$ and $\boldsymbol{2\Phi^{k}}$ with the known basic periods of most fundamental

cycles in Nature and society, within the range of minutes to hundreds of million years. By having not a hint for explaining this, we, however, may see [6] that ATS closely correlates practically all fundamental periods of phenomena in Nature and society namely through the Golden section, and not harmonically.

But the concept of Time includes not only periods, chronology or succession of events make the essence of it. So, ***if*** *the powers of the Golden section, viz. the series* ***F****,* ***define****, in aggregate (or simultaneously),* ***the fundamental periods*** *in Nature and society which flow in parallel,* ***we may suggest****, that the Scale* ***F defines****, when its values are considered in succession,* ***the phases of evolution****, or historical cycles, the duration of which decreases with factor* Φ.

Should the first hypothesis have obtained the forcible arguments [6] being briefly discussed below, testing of the second hypothesis relevant to the evolutional time specified by the ATS makes the essence of this work. This way, the situation might be likened to transfer to sun-clock or GMT from a stopwatch or tuning fork, which measure periods. For this, let us try "to adjust the clock" to the "standard time signals".

As it requires to specify some time reference point, consider well-dated historical events and trends within the structure of Auric cycles specified by the ***Mayan Calendar*** which is unique in world due to its accuracy in count of days; besides, its starting point is defined quite definitely and far in the past, while its date of expiring in 2013 AD (and not in 2012 AD, as it is shown below) is actual for our days. For the same purpose consider also the ***population of China,*** since the demographic data for this country covers the period of 2000 years, in addition to some cosmogeneous factors being considered below.

In order to avoid confusion, the dates and duration of time periods are specified in conventional Gregorian calendar and tropical years (*a*) and days (d). For short, the values in Tables and some intermediate results are rounded; they are calculated in compliance with the precision of the presented source data.

Finally, *the main new results of this work are presented in Para.12 and in Conclusions*. Paras. 1-7 explain, in brief, the required methodology being earlier [6] discussed in details, whereas Paras. 8-11 are devoted to verification of stability of the demographic model.

1. Source Data

Revealing of the laws that describe the time dependencies for the cosmogeneous objects still continues to present an unsolved problem the actuality of which is defined not only by theoretical interest. Its significance for application arises, in particular, from the established synchronism [3,4,6] between the periods of planetary revolutions, Solar rotation, and 11-year Solar activity (SA) cycle from the one hand, and cyclicity of a number of biological, geological, social, and other processes with

duration of seconds to hundreds of million years (and, might be, in a much more wide interval), from the other hand.

However, without obtaining of general mathematical model, that describes the planetary (viz. in a narrow sense) synchronism, there exists no possibility for studying such synchronism in a broad sense, which, in a system, correlates the periods of phenomena of both Cosmogeneous and Earthy nature. For this, a mathematical model of the Solar-Planetary Synchronism (SPS) has been developed [6], which is based on the discovered algebraic structure of periods of the basic Solar System objects. The internal structure of this model is specified by the Auric Time/period Scale (ATS) that presents both the essence of the established SPS, and general model which allows to correlate, through the principle of Unison/Resonance being described below, the SPS periods with the known fundamental periods of cyclic phenomena in Nature and society.

In elaboration of studying of periods, in this work the concept of Auric Time Scale presenting a mathematical model of the SPS is applied to analyzing the phenomena in “historical” time with the aim to verify the hypothesis that the global processes in Nature and society are developing in exponential, or evolutional time being also specified by the ATS rather, than in linear, or harmonic time being described by conventional unvaried periods.

As far as the booklet [6] is published in small circulation, the basic concepts being required for describing new material are given in paras. 1 to 7.

It is known [3,4 et al.], that growth of Solar activity exerts significant influence not only upon atmosphere and biological objects (first of all, onto nervous system and, then, onto cardio-vascular system), but over biosystems and society as a whole. Thus, as it was shown by A. Chijevsky [3] in 1924, maxima in distribution of extremal social events (revolutions, riots, wars, etc.) are closely correlated with the 11-year SA cycle maxima. Due to high degree of integration of the world society, this influence is so important today, that those social and economic forecasts, which describe the state and development of complicated systems [5] might hardly be regarded efficient unless this factor is taken into consideration.

At this, it might be recalled that the Solar activity is understood as a complex of diverse phenomena which cover Sun’s regions of more than few thousand kilometers in diameter (sunspots, flare pads, prominences, etc.) and show pronounced time-dependent variations. Meanwhile, it must be noted also, that the prevailing statistics, both historical and numerical, is collected just for sunspots; in some circumstances they could be observed without a telescope, and this was testified to by the ancient chronicles, which associated emerging of sunspots with evil omen. Besides, as the increase in all manifestations of SA is closely correlated with the growth of sunspot number, the sunspot activity can be taken for the direct indicator of the Solar activity as a whole, not speaking of its esoteric significance [9].

Therefore, with respect to that influence the SA exerts over all spheres of Nature (including social events and individual human beings [1,3,4]), it becomes unrea-

sonable to exclude from consideration those periods, which specify this activity. For this, in addition to planetary revolution periods of Mercury to Pluto, the average 11-year SA cycle period T_0 and Solar equator rotation period t are taken for system consideration. Note, that all these values are given below in the units of Earthy tropical year (a). At this, if T_0 determines the duration of the basic cycle of Solar activity within which four basic phases of background influence are specified [3], the period t determines the periodicity of current SA influence specified by allocation of the actual sunspots, because they exert their influence mainly when passing the central Solar meridian.

As far as the polarity of sunspots and other factors is altered in the sequential 11-year cycles, and the SA influence increases sharply when the sunspots pass the central Sun's meridian at invisible side as well, consider also the periods $2T_0$ (heliomagnetic) and $\tau = t/2$ being not less actual than the basic ones. Besides, for verifying the model, the revolution periods of comet Halley $T_{\copyright}$ and ring of asteroids T_A are considered.

As it is the question of principle that among all these periods the planetary ones are only known within the sufficient precision, for the purpose of this study it is required to define the accuracy of the remaining source data. Thus, it is suggested for t to take the value of the sidereal rotation period of the Solar equator (in days, d), $t = 25.1\,(d)$, and for the average sidereal asteroid ring revolution period T_A to take the arithmetic mean of revolution periods of the most stable elements – all minor planets, or the greatest asteroids with diameters exceeding 100 km., which equals to $T_A = 4.21 \pm 0.5\,(a)$. For the period of comet Halley an average value $T_{\copyright}$*=76 (a)* is taken.

Relative to the value of period T_0, which plays the key part in the Solar-planetary synchronism, the following must be said. At present, a conventional model of deterministic (viz. defined analytically) description of the SA time developing process is absent; moreover, even the average duration T_0 of the 11-year SA cycle is estimated with an error of up to 3%, whereas the inter-maxima periods took the values from 7 to 17 years. Though it is generally accepted in astronomy that the short-termed (up to 2 years) sunspot level predictions could only be efficient, which cannot give a solution to the problem, considering of the ***Regular model*** [7] ***of SA maxima distribution,*** which is obtained on the basis of sunspot activity telescopic observations covering the period of 400 years, allows to approach this problem in a different way, as far as for the most social and economical applications [3,5] it is sufficient to know namely the years of maxima.

The adequacy of ***this super-long-term forecasting model*** had been grounded [7] by a number of direct and indirect acknowledgements, including the Chronicles covering 2200 years [6]. Thus, this Regular model shows that within the source data accuracy of ± 0.07 (a) the obtained average period of 11-year SA cycle makes

$$T_0 = 11.07\ (a) \qquad (1)$$

and determines the equally-spaced time intervals between the following model epochs (viz. years) of 11-year SA maxima

$$t_k^* = 1605.27 \pm T_0 \cdot k, \quad (k = 0, \pm 1, \pm 2, ...), \tag{2}$$

by the data of 17 – 20 centuries, whereas the deviation $\delta_k = t_k - t_k^*$ between the actual t_k and model t_k^* epochs presents strikingly exact and symmetrical double-sided Relay distribution for the given source data. From statistical point of view, this model yields significantly less variance than a "conventional" one which presumes successive development of SA cycles, and allows to forecast the epochs of SA maxima for tens and hundreds (!) of years with more accuracy than the epoch of the forthcoming maximum t_{n+1} could be predicted by the common rule $t_{n+1} = t_n + T_0$, where t_n is the year of the last actual SA maximum.

And what is more, *2/3* of the epochs of actual maxima (viz. *24* of *36* SA maxima over the XVII – XX centuries) form pairs, or clusters $\{t_i, t_j\}$, which could be considered random, or accidental, just with the exceedingly small probability of the order of 10^{-11}, whereas the difference in years for each cluster, $\Delta_{ij} = |t_i - t_j|$, is equal to integer times the period T_0 within an error of *0.3%;* these integer factors being k_{ij}-fold to T_0 are as follows

$$\{k_{ij}\} = \{2, 3, 6, 7, 14, 17, 18, 23, 29, 35\}, \tag{2'}$$

where *3* and *17* are met twice. In other words, we see that the SA maxima epochs show the trend to develop within the Relay-distributed vicinities of the model epochs (2), but not in these epochs exactly, while the same deviations δ_k (of actual from these model epochs) repeat in an integer number (2') of T_0 being defined by (1).

Therefore, all these properties allow to accept the value (1) as not random and, thus, most accurate estimate for T_0.

2. Formulation of the Problem

On the level of the accepted model factors (viz. periods), we may describe the Solar System as a dynamic system whose elements perform their oscillations with definite periods. This way, we come to the general basic concepts of unison and resonance describing an interaction in oscillating processes.

Thus, by analogy with harmonic analysis, define a period T^* as *k*-th harmonic of period T, if there exists such natural k that $T^* = T/k$, and *k*-th *Φ*-harmonic of pe-

riod T (or Φ-harmonic of order k), if $T^* = T/\Phi^k$, where $\Phi = 1.6180339...$ is the Golden section number (See Para. 3).

EXAMPLE. *Since the relation $T_{♂} = 84 \cdot T_{⊕}$ holds for Uranian and Earthy periods, the Earthy year coincides with the 84^{th} harmonic of Uranus (within an error of 0.01%). As $\Phi^5 \approx 11.089$, (within the accuracy of 0.2%) the Earthy year presents the 5^{th} Φ-harmonic of the average duration T_0=11.07 of 11-year Solar activity cycle.*

At this, coincidence of harmonic $T^{(1)}/k$ of one object with the period $T^{(2)}$ (or harmonic $T^{(2)}/m$) of some other object is called ***unison***. When two objects being capable for oscillating interact, it could occur a ***resonance*** (viz. a phenomenon of increase in amplitude, or exiting oscillation) if their periods come to unison.

The phenomenon of resonance is the basis of functioning of some systems and quite undesirable hinder for others. A resonance occurring in an oscillatory circuit being tuned to unison (viz. to coincidence of frequencies) with the radio signal forms the basis of radio communication, but it also may cause interference which is to be excluded, for example, by frequency spacing in multichannel systems. Unison is the required element in music, but gives rise wear of motors, etc.

The phenomenon of unison and its ultimate form, viz. resonance, relates directly to the discussed question: revealing of dynamic factor could cause irreversible changes distracting those foundations which provide functioning of a system. Thus, out of the asteroid revolution periods those are "knocked out" which coincide with the Jupiter's harmonics. The same situation takes place with the slots in the Saturnian rings. But not only the presence of simple ratios of small numbers (1:2, 2:3, etc.) for the planetary revolution periods result in powerful disturbances and loss of stability of motion; a delicate balance of powers could be upset in case of quasi-resonance (viz. coincidence of planetary phases or higher harmonics) too. For example, it is known that full and new moons, to say nothing of eclipses, influence significantly both biological life and social spheres. Simultaneous studying of Jupiter, Saturn and Uranus cycles relative to their phase resonance shows its close correlation with some social effects, as in case of SA.

Therefore, though the Solar activity presents the unique factor of influence, its period may come in unison with the planetary resonance; an algebraic structure of such unisons might be called a Solar-Planetary Synchronism (SPS) in a narrow sense. If, in addition to conventional planetary influence, these unisons define new essential correlation between the cosmogeneous and Natural and/or social phenomena periods, it would make sense to call the latter a Solar-Planetary Synchronism in a broad sense. Consider, firstly, the structure of SPS in a narrow sense.

If we assume that SA cycles and planetary periods are tuned reasonably (whereas it is hardly probable that we could find other alternative), then, out of rarity of exact SPS unisons at simultaneous significance of their physical consequences, we can conclude that this fuzziness in unisons is provided by Nature and there exist no point in attempting to establish "exact" relations for harmonics of SA cycles and

planetary revolutions there, where they are absent. From the other hand, this fuzziness in equalities might not be limitless.

In other words, we may expect that conciliating of the polarities of "destructive" resonance and "harmonizing" unison, which present the same mathematical idea of equality of periods, is actually to be searched in definite vicinity, but not in precise equality or indefinite proximity of periods and/or harmonics.

For this, establishing of unisons is carried out by considering a relative error δ_* for the equalities of periods and harmonics, which presents the average accuracy for the least exact, but actual periods T_0 and t

$$\delta_* = \sqrt{\delta_0 \cdot \delta_t} \approx \sqrt{(0.6\,\%) \cdot (1.7\,\%)} \approx 1\% \ .$$

Namely, in order to estimate the proximity of some quantities A and B, consider an analogue of relative error

$$\delta_{A,B} = \frac{|a-b|}{\min(|a|,|b|)}\,, \tag{3}$$

where a, b are the values A, B, or their estimations (or approximate values) being used in calculations. Then, the values A and B are considered to be equal, if $\delta_{A,B} \le \delta_*$, which is denoted as

$$A \cong B \quad (\delta_{A,B})\,, \quad \text{or} \quad A \cong B \quad (\delta_{A,B}\,\%)\,.$$

For the above Example, within an error of *0.01%* the Earthy sidereal year $T_{♁}$*=1.00004 (a)* might be considered as the 84^{th} harmonic of the Uranian sidereal revolution period $T_{♅}$*=84.01529 (a),* because $T_{♅}/84$*=1.000182* and the proximity of this harmonic to the Earthy period equals to

$$\delta_{\,T_{♁},\,T_{♅}/84} = \left|\frac{1.000182 - 1.00004}{1.00004}\right| \approx 0.00014 = 0.014\% \approx 0.01\%\,.$$

Thus, we come to the ***Problem of searching of SPS in a narrow sense***:
Find an algebraic structure of unisons for the periods

$$\boldsymbol{t,\ T_0,\ 2T_0,\ T_{☿},\ T_{♀},\ T_{⊕},\ T_{♂},\ T_{♃},\ T_{♄},\ T_{♅},\ T_{♆},\ T_{♇},\ T_{☉},\ T_{☾},\ (T_{☾})}$$

which take place in the sense (3) for $\delta \le \delta_* \approx 1\%$.

The correspondence between this mathematical problem and its physical manifestations might be set up with the following system of concepts.

Principle of Unison/Resonance (*Principle UR*):

Let there be the objects Q_1, Q_2 with periods T_1, T_2 ; $T_1 > T_2$. Then:

UR1. Qualitative measure of capability of the objects Q_1, Q_2 to be in unison / resonance with respect to the fundamental periods is defined by the equation

$$T_1 \cong kT_2\ (\delta), \tag{4}$$

where k is a natural number.

At this, ordering of the periods with respect to decrease in their magnitudes allow to draw an analogy by saying that in the sense of UR the object Q_1 is "influencing" the object Q_2 by its k-th harmonic. This analogy reflects the relation $T_1 > T_2$ between the fundamental periods, that means that some harmonic (viz. a period T/k) of object Q_1 may excite a full-scale resonance in Q_2 by fitting its fundamental period T_2; but not vice versa.

UR2. Quantitative measure of capability of the objects Q_1, Q_2 to be in unison/resonance is estimated by:

(i) accuracy δ in equality (4);

(ii) value being inverse to the harmonic number k, viz. the vicinity of the value k to 1.

UR3. Should k in (4) be a rational fraction, the objects Q_1, Q_2 are called to be in unison/resonance with respect to harmonics.

From general considerations it could also be accepted that:

UR4. The longer the objects are in unison, the more the probability for the resonance to occur and to sharpen.

UR5. If some periods correspond to "absolute" time scale, there should be such reference point(s) relative to which all of them are synchronized.

The SPS model that is based just on a harmonic structure (viz. presents ratios of natural numbers only) would describe this phenomenon, in general, as a stationary process where the average parameters remain time-invariable. In this sense it could be named a linear development, or harmonic (cyclic) time model where time is basically measured in units of unvaried orbital revolutions (e.g. 1 year yields the derivatives: 1 century=100 years, 1day=1/365.24 year, etc.).

A linear development defines the most simple two-phase system: rest (no resonance) – variations (resonance). We may suppose a three-phase system of evolutional

type to be substantially more viable by virtue of providing both qualitative and quantitative growth: birth (coming of new feature into existence), rest (stationary accumulation), transformation (transition from quantity to quality). Other non-linear models might be possible as well; the main thing is that they must differ from harmonic-type system for their influencing factor to be able to modulate the harmonic cycles being homogeneous on the average (viz. to provide a development via the spiral), since replenishing a harmonic system with any additional harmonic or rational factor would not drop the model out of the harmonic model limits.

In the capacity of such replenishment for a harmonic model consider the concept of development on similarity (or by analogy to the achieved), which is specified by the Golden section being exceedingly widespread in natural phenomena and arts as a fundamental element defining their structure relative to time and space.

3. Auric Time/period Scale (ATS)

Measuring of pyramids and other objects of the ancient Egypt and India allows to state that the Golden Section is known from the antiquity. Leonardo da Vinci gives it a name Sectio Aurea (that is used below as an adjective for the Golden Section), while much earlier the discovery of Fibonacci series had laid the base for detailed mathematical studying of this concept.

Historically, the Golden Section came to us as the law of proportional connection between the whole and the parts composing this whole. To this end, a classical example of the Golden Section is the division of a segment in the mean-proportional ratio, where the whole $(c = a + b)$ is to greater part (b) as the greater part to the lesser part (a)

$$\frac{a+b}{b} = \frac{b}{a} \ .$$

Solving of this proportion gives the ***Golden Section number***

$$\boldsymbol{\Phi = 1.618\ 033\ 9\ldots}\ , \tag{5}$$

though sometimes the above proportion is presented in the inverted form, as the ratio of the lesser to the greater, or greater part to the whole, viz. *b/(a+b)=a/b,* which gives the inverse presentation of the Golden Section number

$$\varphi = 1/\Phi = 0.618\,0339\ldots$$

where coincidence of mantissas is not occasional, as

$$\Phi = \varphi^{-1} = 1 + \varphi\ .$$

And namely this Golden Section number Φ engenders the following infinite series, which determine the Auric structure of the Solar-Planetary Synchronism in the narrow sense:

**Auric series F* (viz. infinite, in both ends, geometric progression with the quotient Φ)

$$\dots, \Phi^{-k}, \Phi^{-k+1}, \dots, \Phi^{-1}, \Phi^{0}\equiv 1, \Phi^{1}, \Phi^{2}, \dots, \Phi^{k-1}, \Phi^{k}, \dots \qquad (6)$$

*Harmonic ***replenishment of Auric series*** *of order* ***k***, $k\geq 1$, that is the series $\boldsymbol{F_k}=\{k\cdot \Phi^{i}\}_i$, or

$$\dots, k\Phi^{-k}, k\Phi^{-k+1}, \dots, k\Phi^{-1}, k\Phi^{0}\equiv k, k\Phi^{1}, k\Phi^{2}, \dots, k\Phi^{k-1}, k\Phi^{k}, \dots \qquad (7)$$

as well as the following series, which give an integer presentation of the above ones on the basis of ***Fibonacci numbers*** being obtained by two initial values and iterative rule: "the next value = the sum of two preceding ones"; namely,

* ***Fibonacci series u*** = $u_1, u_2, u_3, \dots$, being defined by the rule

$$u_{n+1} = u_n + u_{n-1}, \ \textit{where} \ \ u_1=1, \ u_2=1; \qquad (8)$$

* ***Adjoint series v*** = $v_1, v_2, v_3, \dots$, being defined by the rule

$$v_{n+1} = v_n + v_{n-1}, \ \textit{where} \ \ v_1=1, \ v_2=3; \qquad (9)$$

* ***United series z*** = $u_1, v_0, u_2, v_1, u_3, v_2, u_4, v_3, \dots$, where $v_0=0$.

NOTES. The harmonic replenishment of order 1, i.e. F_1, is the series F itself. The initial terms of these series being actual for the below considerations are given in Table 1. It is important also, that due to the equality

$$v_k = \Phi^k + (-\varphi)^k \qquad (10)$$

the difference between the terms v_k and Φ^k is rapidly decreasing with the growth of k, and for $k=5$ becomes less than 1% (See Table 1). Besides, the values Φ^k exactly, and v_k – asymptotically (that is with the growth of k) divide the intervals between the Fibonacci numbers u_{k+1} and u_{k+2} in the Golden Section. Some other properties of these series are also may be found in [6].

Table 1. Fibonacci Numbers $\{u_k\}$, Adjoint Series $\{v_k\}$ and its Approximation Φ^k (Initial terms)

Fibonacci series ***u***		Adjoint series ***v***			Auric series ***F***
Term	Value	Term number, ***k***	Term, v_k	Value	Value of Φ^k
u_1	1	0	(v_0)	1	1
u_2	1	1	v_1	1	1.618
u_3	2	2	v_2	3	2.62
u_4	3	3	v_3	4	4.24
u_5	5	4	v_4	7	6.85
u_6	8	5	v_5	11	11.09
u_7	13	6	v_6	18	17.94
u_8	21	7	v_7	29	29.03
u_9	34	8	v_8	47	46.98
u_{10}	55	9	v_9	76	76.01
u_{11}	89	10	v_{10}	123	122.99
u_{12}	144	11	v_{11}	199	199.00
u_{13}	233	12	v_{12}	322	322.00
u_{14}	377	13	v_{13}	521	521.00
u_{15}	610	14	v_{14}	843	843.00
u_{16}	987	15	v_{15}	1364	1364.0
u_{17}	1597	16	v_{16}	2207	2207.0
u_{18}	2584	17	v_{17}	3571	3571.0
u_{19}	4181	18	v_{18}	5778	5778.0
u_{20}	6765	19	v_{19}	9349	9349.0
u_{21}	10946	20	v_{20}	15127	15127.0
u_{22}	17711	21	v_{21}	24476	24476.0
u_{23}	28657	22	v_{22}	39603	39603.0
u_{24}	46368	23	v_{23}	64079	64078.9
u_{25}	75025	24	v_{24}	103682	103681.9

Note: the column "Term number, *k*" relates to Adjoint and Auric series.

4. Planetary (Harmonic) Series and their Basic Properties

Define the main planetary period $T_{)(}$ for the Solar System, that is the minimal period which specifies the planetary periods as harmonics, by averaging the close values $42T_{‡}$, $6T_{Õ}$, $3T_{Š}$, and $2T_{Ô}$ and call it by the name of hypothetical planet **Proserpine** for which the designation **)(** is used and whose period is associated with the near value. Either this planet exists, or not, this period $T_{)(}$ presents the key-stone in the structure of the Solar-planetary synchronism as the fundamental period for both planetary and Solar activity ones. Indeed, its second harmonic coincides with period of Pluto (See above, $T_{)(} = 2T_{Ô}$), the third – with that of Neptune ($T_{)(} = 3T_{Š}$), etc. (See Table 2).

As the value $T_{)(}$ presents the fundamental period for the Solar System as the whole, some lesser ones fulfil the same role for the inner planets. This allows us to reveal the following enclosed planetary series ($R_1 \subset R_2 \subset R_3$)

$$R_1=\{\,♃,\ ♂,\ ☐,\ ♀,\ ☿\},$$
$$R_2=\{\,☉,\ ♄,\ ♃,\ ♂,\ ☐,\ ♀,\ ☿\},$$
$$R_3=\{\,)(,\ ♆,\ ♅,\ ☉,\ ♄,\ ♃,\ ♂,\ ☐,\ ♀,\ ☿\},$$

the root planet $T^{(n)}$, *(n=1, 2, 3),* of which are defined by the largest period in a series, viz. by Jupiter ($T_{♃}$), Uranus ($T_{☉}$), and Proserpine ($T_{)(}$), respectively. Denote $R_n(\alpha)$ a replenishment of these series with object "α" specifying rotation of the Sun (☌, with periods τ, t), 11-year SA cycle (✲, with period T_0), and ring of asteroids (AA, with period T_A).

In these planetary series (See Table 2), the integer approximation $\omega_i^{(n)}$ for the relation $T^{(n)}/T_i$ defines the period $T^{(n)}$ in the series R_n (e.g. harmonic of the Earth in the Jupiter's series equals to 12, and to 84 in the series of Uranus), while $\omega_{Rn}^{(n+1)}$ defines harmonic of the root planet's period of the series R_n in the series R_{n+1} (e.g. harmonic of Jupiter in the series of Uranus equals to 7). Let $C_i^{(n)}$ be the factors (viz. harmonic or factors that comprise it) of period T_i in the series $k \le n$.

Then, we obtain that the enclosed series R_1, R_2, R_3 present the property of similarity which manifest itself in the following rules of multiplicativity and additivity:

$$\omega_i^{(n+1)} = \omega_i^{(n)} \cdot \omega_{Rn}^{(n+1)}, \qquad C_i^{(n+1)} = C_i^{(n)} \cup \omega_{Rn}^{(n+1)}, \tag{11}$$

which define, in particular, both the system of planetary unisons and common factors, and the key role the root planets (Jupiter, Uranus, and Proserpine) play in an interplanetary interaction.

At this, due to the principle UR (factors UR2ii, UR4), we may suppose that since the root planet R_3 presents the greatest period, it specifies the *"basic" planetary* influence being further "detailed" by the root R_2 and, in its turn, the latter is detailed by R_1. As a result, each planet is influenced by one to three root planets as well as by complementary unisons relative to common factors with other planets and Sun.

Meanwhile, the more precise correlation between harmonics exists, the more (factor UR2i) powerful interaction could take place. In details, these ideas are verbalized in Para. 7.

But seemingly the most surprising property of these series states [6], that the arithmetic mean harmonics $\omega[R_i(\alpha)]$, $(i=1, 2, 3)$, coincide with the sequential terms of the Fibonacci series of type z ; in other words, if apart from the planetary periods $T_{„}$, $T_{…}$, $T_{Å}$, $T_{†}$, $T_{‡}$, $T_{ˆ}$, $T_{Õ}$, $T_{Š}$, $T_{Ô}$, $T_{)(}$, the periods of the set $\alpha=\{\tau, t, T_0, T_A\}$ in any combination are considered in the series $R_1 - R_3$, then all these planetary combina-

tions form a group structure the numerical values of which sequentially fit the terms of the series ***z*** (on the definite segment, naturally).

Table 2. Planetary Series and their Harmonics

Object			Series of Jupiter, R_1		Series of Uranus, R_2		Series of Proserpine, R_3	
# i	De-sign.	Sidereal period T_i (Tropical years)	Harmonic in the series of Jupiter and relative error (δ%)		Harmonic in the series of Uranus and relative error (δ%)		Harmonic in the series of Proserpine and relative error (δ%)	
1	☿	0.068718 (t=25.1 d)	174 175	(0.8) (1.4)	1218 1225	(0.4) (0.2)	7308 7350	(0.2) (0.8)
2	♀	0.24085	50	(1.5)	350	(0.3)	2100	(0.9)
3	⊕	0.61521	20	(3.7)	140 136	(2.5) (0.4)	840 816	(3.0) (0.2)
4	☾	1.00004	12	(1.2)	84	(0.01)	504	(0.6)
5	♂	1.88089	6	(4.9)	42 45	(6.0) (0.7)	252 270 (0.7)*	(5.7) (1.3),
6	☄	4.21	3	(6.1)	20	(0.2)	120	(0.8)
7	☼	11.07	1	(6.7)	8	(5.4)	45	(0.6)
8	♃	11.86223	**1**		7	(1.2)	42	(0.6)
9	♄	29.45772			3	(5.2)	17	(0.07)
10	♅	84.01529			**1**		6	(0.6)
11	♆	164.78829					3 (0.8)*	(1.4),
12	**♇**	247.6968					2 (0.6)*	(1.2),
13	**☾☼**	501.144					**1**	

NOTES. 1. Harmonic of the object in a planetary series is the integer being nearest to the ratio of the root planet and object periods, the rounding error is given in brackets.

2. For the series of Proserpine (☾☼), an asterisk denotes the accuracy relative to $T_{♃}$.

3. The period for the Proserpine is further specified with respect to the Auric series.

5. The Auric Series and their Basic Properties

Consider the Auric series $F = F_1$ and assume that its unity $\left(1 = \Phi^0\right)$ defines the Earthy year. Then, Φ^1 defines 1.618… years, viz. 1 year and 7.5 months, whereas $\Phi^{-1} = \varphi = 0.618\ldots$ defines 0.618 year, viz. 7.5 months, etc. Side by side with F, consider its replenishment of order 2, that is the series F_2 which defines the twice intervals. In some cases the series F_3 may present an interest as well. Within the specified accuracy, these series present the following properties [6].

Nine of the considered periods,

$$\tau,\ T_{\mathrm{☿}},\ T_{\mathrm{♀}},\ T_{\oplus},\ T_0,\ T_{\mathrm{♄}},\ T_{\mathrm{☉}},\ T_A,\ T_{\mathrm{☽}},$$

get into the series F (viz. coincide with the appropriate powers of the number Φ), whereas the remaining ones get into F_2 and F_3, and only the Neptune's period comes to F_9. At this, if the basic planetary period does not fit F, some basic harmonic gets, which is defined primarily by minimal factor of the nearest root planet. For example, for the series F these are 3rd harmonic of Mars ($T_{\mathrm{♂}}/3 = \varphi$, *3* is the factor of harmonic *6* of Mars in the Jupiter's series), 2nd harmonic of Pluto ($T_{\mathrm{♇}} / 2 = \Phi^{10}$, *2* is the Pluto's harmonic in the general planetary series R_3), etc.

At the same time, equally with the series F (or F_1, which is the same) the series F_2 must be considered as the most actual, because in complement to basic planetary periods and/or harmonics these two series include the basic periods of both 11-year $\left(T_0, 2T_0\right)$ and current $\left(\tau, t\right)$ SA cycles which structures the former ones.

Besides, by setting the unit of the series F to the period T_0 we would clearly see that namely this period specifies the center of the Solar-planetary synchronism [6]. Thus, T_0 presents the Golden-section center of distribution of periods over the principal Auric series F and, simultaneously, unite all these series $F_1, F_2, F_3, \ldots$ by their units $T_0, 2T_0, 3T_0, \ldots$, etc. This way, these Auric series being centered to T_0 might equally be called the Solar series.

> *Therefore, the* ***period T_0 and the Auric series*** *(centered to it) – first of all the series* ***F_1*** *and* ***F_2*** *–* ***define the kernel of the SPS in the narrow sense****. As the planetary series with their planetary harmonics and factors are integrated in the series $F_1, F_2, F_3, \ldots$,* ***we may suggest****, that* ***the Auric series F and F_2 specify*** *with their terms* ***the global scale of Unisons/Resonances (or UR-points)****.*

From the viewpoint of the concept of the Unity of the Universe and in compliance with the principle of Unison/Resonance, we may also to conclude the following.

Relatively close correspondence of maximal planetary period $T_{)(}$, which defines the principal frequency for harmonic series, with the Auric series F may be estimated **as if the function of the *Proserpine* is to synchronize the rhythms of the Solar System with the influence of the External Space,** or Extra-Solar-System, through the Auric and planetary series. This close fitness of the period $T_{)(}$ to both types of series gives a complementary support in searching of hypothetical ***planet Proserpine*** and allows ***to estimate its period as*** $T_{)(} = 510.9 \pm 9.5$ ***(a).***

Periods being less than τ, as we may suppose, present insignificant influence on planetary interaction, but not on the contrary. As variations in SA present noticeable response, at least – on the level of electromagnetism, **the periods τ, t might be regarded as regulators of intrasystem (viz. intraplanetary) processes**, which synchronously transfer Solar-planetary influence, basically, through the Auric series.

The Jupiter's period does not directly (i.e. with the accuracy accepted) fit any Auric series F_i at small (viz. significant) value of i, but within the accuracy of 6.6% it coincides with T_0. Though this error is few times greater than the allowable one, we may consider this to be a protection against an excessive resonance (that otherwise would take place at low error) in the system of near periods T_0, $T_\ddagger$. From this viewpoint **these two periods might be considered as the "Internal System Generator**" of influence being Auric with respect to Sun, and harmonic – relative to Jupiter.

It is also very important that Auric unison, in contrast to harmonical one, remains relevant for correlating the periods differing by several orders. Thus, for the given accuracy $\delta_* \approx 1\%$, for a harmonic unison the unique harmonic might be detected, but with a number not exceeding 50, though there exist no restrictions of this type for an Auric unison for existing phenomena periods.

Time is usually understood as a period of some phenomenon of cyclic type, from which the multiples are derived with the use of natural numbers; namely this permits to call it local and harmonic. The Auric time is understood as the time counting system that is specified by the Auric series ***F*** by setting its unit to a period of some unique phenomenon belonging to the Aurically correlated periods coinciding with the terms of the series ***F***. If both the Auric and harmonic system are set up to the same unit, in absence of errors they would give the same time. However, it is not only presence of errors that allows to distinguish these systems, but exponential structure of Auric Time(/period) Scale which forces the latter to be studied thoroughly by putting forward and verifying the following

HYPOTHETHIS.

(**1**) ***The Auric*** *(Time/)* ***Period Scale*** (ATS) being specified, first of all, by the series F and F_2 reflects the scale of periods of basic phenomena in Nature and society over the numerically visible and steady range of time intervals, whereas manifestation of each phenomenon is developed locally, in harmonic time (being stable over a restricted number of harmonics) correlated with the basic period of this definite phenomenon. At this, not basic phenomena may correlate with replenished series.

(**2**) ***The Auric Time (****/Period)* ***Scale*** (ATS), in compliance with the multiplicative structure of the series ***F*** and in contrast to conventional considering of historical periods of equal duration, specifies the duration of successive historical (or evolutional) cycles, for the basic phenomena, in the exponential scale F, viz. $\boldsymbol{\Phi^k}$, whereas some discrete processes may develop in its natural approximation, in the series $\boldsymbol{2^k}$.

6. Verification of the Hypothesis on ATS Relative to Periods of Phenomena

The above results concern the Solar-Planetary Synchronism in a narrow sense, which relates the planetary periods. Generalization of this synchronism onto periods of the Earthy phenomena presents SPS in a broad sense, which is described by correlation between the terms of the Auric series F and F_2 being centered on the SA periods T_0 and $2T_0$, and periods of natural phenomena. For convenience of count of time, the critical periods of ATS, or the terms of the series F and F_2 being called the points of unison/resonance (UR)

$$\Phi^k \text{ and } 2\Phi^k, \quad (k=0, \pm1, \pm2,\ldots), \tag{12}$$

are specified [6] in the conventional Earthy time units (viz. in tropical year and its partitions) and designations. Thus, the record *7a*, *1d*, *3h*, *2m*, *3s* denotes 7 years, 1 day, 3 hours, 2 minutes, 3 seconds. Further on, in order to simplify designations and use just positive powers, designate the UR point periods in Earthy years as follows

$$D_j=\Phi^j \ , \qquad (j=0, 1, 2, \ldots); \tag{13}$$

$$d_i=\varphi^i, \quad \varphi^i =1/\Phi^i \ , \quad (i=0, 1, 2, \ldots). \tag{14}$$

Then, 1 Earthy year is the period $\varphi^0 = \Phi^0 = 1(a)$, whereas the period d_1 makes

$$d_1 = \varphi^1 = 0.6180339\ a = 0.6180339 \cdot 365.25\ d = \\ = 225.7431d = 225\ d\ 17\ h\ 50\ m\ 3\ s. \tag{15}$$

At this, the average 11-year SA period T_0 fits the term Φ^5, that is

$$T_0=11.07\ (a)=\Phi^5\cdot\Phi^{-5}\cdot 11.07\ (a)=\Phi^5\cdot T_{\odot}\cdot 0.9983\approx\Phi^5\cdot T_{\odot}\qquad(0.17\%),\qquad(16)$$

whereas the UR points d_i^*, D_i^* of the Heliomagnetic series F_2 which correspond to the points (13), (14) are specified as follows

$$d_i^*=2\,d_i\,,\quad (i=0,1,2,\ldots),\qquad(17)$$

$$D_i^*=2\,D_i\,,\quad (i=0,1,2,\ldots).\qquad(18)$$

In conjunction with (13), (14) they engender asymptotically the united series ***z*** comprising the series ***u*** and ***v***. Within a negligible error ***this means that the Fibonacci numbers (8), (9) also fit the Auric Time/period Scale.*** To this end, it is interesting that the average number of Solar days (viz. *t*) in Heliomagnetic ($2T_0$) or Solar (T_0) year equals, respectively, to

$$2T_0/t\approx\Phi^{12}\approx 322,\qquad T_0/t\approx 161,$$

that could be taken as 12 phases of development of the Solar day in a complete, 22-year, SA cycle. The same analogy might be considered for any period $T=\Phi^k$ of the Auric series; e.g., for the Earth ($T_{\odot}=\varphi^5\cdot T_0$) the Solar year is 5 phases of development of the Earthy year; the Saturn's year is two phases of development of Heliomagnetic year, etc. In detail, this concept is developed below (See Sec. 8 – 12).

Close correlation of the periods [3,4 et al] of the fundamental phenomena in biology (cell and physiological rhythms), botany (vegetative cycles, etc.), zoology (head of livestock, catch of fish, etc.), meteorology, physics of Sun and Earth, economy (Kondratiev's and other cycles), history, criminalistics, and so on – up to seismic and geological cycles with those periods which are determined by Tables 3,4 ***leaves little hope for these periods to be coincided accidentally*** at such great interval of values.

What is more, it is ***namely the ATS*** that ***describes*** (at least, on the level of synchronism) those ***irrational harmonics which appear in the natural phenomena.*** To this end (as well as in the sense of accuracy), special interest presents the report presented by Bobova and Dergachiov [3], *where the frequency spectrum of ^{14}C carbon content in wood cuts is shown with a per-decade accuracy:*

"From the viewpoint of geophysics and astrophysics, the radiocarbon spectrum (among other cosmogeneous isotopes which engendered in the Earthy atmosphere and recorded in different natural archives) is the most interesting geophysical global parameter. The most important problem of radiocarbon researches consists in understanding of ^{14}C content variability spectrum for the samples of the known age …", and, then, the conclusion: "As the results of study of 4500-year series of radiocarbon accumulation over 10year cuts of rings of trees it is obtained the discrete frequency spectrum for the range from 40 to 4000 years; n-fold harmonics of more powerful period of ap-

proximately 3600 years (or 7000 years) are detected, up to the 7th harmonic. An energetic spectrum violation is detected near 500 years, whereas another peculiar point of the spectrum is the period about 200 years and its harmonics. Should the frequency in these points be not an overtone of some other peculiar point, the periods corresponding to these frequencies could be fundamental, e.g. the ***values about 500 (a) and 200 (a)****. In this case, the periodical spectral peculiarities of the radio-carbon spectrum* ***testify to presence of natural oscillators in the Sun-Earth system****".*

Apart from other ones [3], the following comparisons manifest that with a high degree of reliability we can conclude that this is quite so:

$$3600 \cong T_{17} = 3571\,(0.8); \qquad 7000 \cong T_{17}^{*} = 7142\,(2);$$

$500 \cong T_{13} = 521\,(4)$, as well as 500-550, 450-550 with center at T_{13};

$$200 \cong T_{11} = 199\,(0.5).$$

Such a close correlation of empirical and "theoretical" (viz. ATS) period distributions allows to take it for granted that cosmogeneous factors manifest themselves on the level of natural phenomena in harmonic/Auric system much more precisely than in harmonic-solely model with "isolated" basic periods. The same holds true for the social and economical phenomena [6], and, especially in Kondratiev's cycles.

Therefore, by taking into account that series F is engendered by integer powers of the Golden Section Φ***, and the series*** F_2 ***– with multiplying these powers by 2, we obtain that within the accuracy being not less, in general, than 1%, almost all considered periods being associated with cosmogenious, geophysical, Solar activity, social, meteorological and other phenomena in the range of daily to geological rhythms (viz. from hours to hundreds of million years) not only coincide with the terms of these two series, but with only 42 pairs of UR points or values being inverse to them, which are engendered by number 2 and integer powers of the Golden Section number*** Φ**.**

This gives good reasons for the Hypothesis on Auric (Time/)Period Scale, as well as for conforming the existence of the Solar-Planetary Synchronism in a broad sense, at least – relative to the periods of the basic phenomena in Nature and society.

Table 3. Bands of Auric Time/Perid Scale Periods Relative to time Unity $T_{\square}$

Design.	Band name	Band values (a)	Band values (T_{min},T_{max})	Brief description
R_1	Infra	"0",...,φ^{37},φ^{36}	T<1s ("0", 1s)	Fractions of sec.; physical and chemical phenomena
R_2	Micro	φ^{35},...,φ^{13}	1s<T<$t_{\square}$ (1s, 1d)	Hor., min., sec. Daily biorhythms
R_3	Mini	φ^{12},...,φ^{6}	$t_{\square}$<T< $t_{,}$	Days; monthly rhythms

Design.	Band name	Band values (a)	Band values (T_{min},T_{max})	Brief description
			(1d, 33d)	
R_4	Midi	φ^5,...,φ^0, Φ^1,...,Φ^5	t,<T< T⊛ (0.1a, 11a)	Months and years; Current cycles of social and biosystems
R_5	Socio	Φ^5,...,Φ^9 u_{11}	T⊛<T<u_{11} (11a, 89a)	Decades; long-termed social, political and economic cycles; Biorhythms of large systems
R_6	Ethno	Φ^{10},...,Φ^{13}	u_{11}<T<2T)((89a, 1000a)	Centuries; centurial cycles of large systems
R_7	Hyper	Φ^{14}, Φ^{15},...,"∞"	T>2T)((1000a, "∞")	Millenniums; climatic, geological and other supercycles

Notes. Numerical value of the power Φ^k (or φ^k) gives the period duration in the Earthy years (a). In order to come to the Solar year (T_0) unit, multiply all values by φ^5. The values of powers of φ^k defining fractions of the year are presented in days, minutes, seconds (d, m, s), where t □=1d; t,= 1 Solar day, t.

Table 4. Periods of UR Points for Midi-, Socio-, and Ethno-Bands (in years)

i	Period value in the series F (**1**= T□), T_i $D_i = \Phi^i$	Correlatives		Period value In the series F_2 (**1**= 2 T□), $D_i^* = 2D_i$	Correlatives	
		Series **v**, v_i	Period T_α		Series **u**, u_i	Period T_α
	Midi-band R_4					
-5	0.0902 (=33d)	(u_9=34)		0.1803		
-4	0.1459 (=53d)	(u_{10}=55)		0.2918		
-3	0.2361 (=86d)	(u_{11}=89)	T„	0.4721		
-2	0.3820 (=140d)	(u_{12}=144)		0.7639	1	
-1	0.6180 (=226d)	(u_{13}=233)	T...	1.2361	1	
0	1.0000(=365d)	1 (u_{14}=377)	T□	2.0000	2	
1	1.6180	1		3.2361	3	
2	2.6180	3		5.2361	5	
3	4.2361	4	T_A	8.4721	8	
4	6.8541	7		13.7082	13	
5	11.0901	11	T⊛	22.1803	21	2 T⊛
	Socio-band R_5					
6	17.9443	18		35.8885	34	
7	29.0344	29	T·	58.0689	55	
8	46.9787	47		93.9574	89	
9	76.0131	76	T● (Halley)	152.026	144	
	Ethno-band R_6					

10	122.992	123	T♁/2	245.984	233	T♁
11	199.005	199	τ=200*a*	398.010	377	τ=400*a*
12	321.997	322		643.993	610	
13	521.001	521	T☾	1042.00	987	τ=1000*a*
	Hyper-band R_7					
14	842.998	843		1686.00	1597	
⋮	⋮	⋮	⋮	⋮	⋮	⋮

Notes. Due to the given above properties of the Fibonacci series, T_i converges asymptotically to term v_i of the series $\boldsymbol{v}$, and $2T_i$ – to Fibonacci number u_{i+3} with a factor *1.055*. Due to the equality $u_{14}=377\cong365.24$ *(3%)* days, viz. $T_{\oplus}$, we obtain that R_3, R_4 … band periods presented in days form the Fibonacci series with an error about *3%*; the respective pairs of values (in brackets) are given for the Midi-band.

7. Verification of the ATS Relative to Mythology and Music

7.1. The Heavenly Bodies and their Earthy Images

Though some person consider Theosophy and Mythology to be devoid of consistency pertaining just to natural science, the author, while not aiming to convince them in the opposite, supposes it to be useful to draw analogies between some algebraic peculiarities of the Solar-Planetary Synchronism model and these ancient concepts in order to make the picture complete.

In Theosophy [9], the Solar System is understood as a vital-mechanical organic entity, or a hierarchical system where the Sun and planets interact with respect to definite laws. At this, the 11-year SA cycle defines the rhythm of this interaction being accompanied by radiating and receiving of psycho-magnetic vital energy throughout the Solar System.

It is known also, that the most religious, philosophical, and scientific concepts reflect how the humanity percepts the Space. At least, the harmonics and factors, the Earthy rotation period specifies, give the values $\mathbf{12}=3\times4$ (within the Jupiter's series), **7** (within the Uranian series), **6** (within the main series with period T☾), and **5** (the Earthy position within the Auric series *F* relative to the Sun), which form the basis for count of time and angle. At the same time, these numbers are engendered by the initial terms of the Fibonacci series (See Table 1), that is, finally, by the ATS.

More than that, these numbers, together with the 7^{th} term $(u_7=13)$ of the Fibonacci series, form the basis of the Mayan Calendar which has no analogs (See Sec. 12) in the world. *So, all these numbers are not random in our life as they are especially actual for the Earth, because they define its fundamental resonances in the Solar System.*

Therefore, should this numerical basis define not only count of time and angle, but the religious feasts (Christmas, Easter, and other ones being more or less directly

associated with these periods and their phases – solstice, equinox, etc.), it would be naturally to expect the pagan Mythology to reflect definite cosmogonical concepts as well, the more so the pagan's astronomy, as it was shown above, in some cases was not less exact than the modern (or last century) one.

Last, but not least, it is known that the planets had not been named by chance.

That is why it is even more interesting to retrace the analogy between the properties the planets can manifest with respect to their position within the planetary and Auric series, and those functions the Mythology prescribes to Olympic gods or their Roman doubles, while using the per-name correspondence. At this, in order to keep the fidelity of comparisons, the concepts "influence" and "control" are used for the gods' functions as for planetary periods, viz. in compliance with the principle UR.

Proserpine (Gr. – Persephone, wife of Hades, or Aides; Eg. – Isis, wife of Osiris), the wife of Pluto. By the will of the highest Olympic gods (viz. with respect to the Cosmic Law), half of a year she spends in the underground kingdom of Pluto, and during this time the Nature has a rest ("dies"), and half a year she makes the Earth fertile, thereby symbolizing both the longest, viz. yearly, cycle in the Nature among those being evident to a farmer, and the female principles of engendering and recurrence of life, as well as constructing and correcting of civilization considered as living organism on the basis of treating the elements within a singular system which she reconstructs without destroying.

As we can see, this Mythological characteristic fully corresponds to that part which the planet with the period $T_{)(}$ have to play: by specifying the fundamental harmonical period of the Solar System and fitting the main Auric series F, *to conduct the external Cosmos influence* with the aim to transfer its engendering power into the Solar System in compliance with the intra-Solar-System rhythm. The rest of the planets perceive this influence (being apprehended and modulated by the Proserpine) in compliance with the correspondence between their orbital periods and Proserpine's harmonics.

Pluto, the husband of Proserpine, the sovereign of the other world, or underground kingdom, or miracle abyss where he stores the secret and countless reserves to which a direct access is absent; thereby he symbolizes the processes of profound transformation (life and death, transmutation of elements, etc.) and all the powers of the Earth's energies (from minerals to volcanoes). If Proserpine percepts, then, Pluto, by symbolizing the male origin, governs and conducts the Highest Law by directing the highest, titanic power at his own discretion onto solving the cardinal problems.

The planet Pluto being provided with system harmonic and basic factor 2 (viz. octave, or harmonic similarity) defines by this the polarization, i.e. the same transformation of influences. And its fundamental period fits the second Auric series, while the first harmonic $T_{\hat{O}}/2$ – the first series F, as if it commutates the basic Auric and Planetary series for distributing the Space energies through them like the sovereign of the bowels of the Earth, thereby coming forward as the Solar System Ener-

getic Center. The versatile SPS-connection of these two planets corresponds fully to conjugal ties of their mythological doubles.

Neptune. (Gr. – Poseidon), a Pluto's brother, the sovereign of the sea depth; he presents the Chaos comprising the whole world in its indivisibility, and the rhythmical harmony of the Chaos converted to the Cosmos. The world originates from Chaos and returns to it. The influence conducted by Neptune is vague, unsteady, full of fog. Like this, the planet Neptune in some sense [9] does not belong to the Solar System. Its period corresponding to harmonic 3 of the planetary series of T)(conducts a time-expanding influence; Auric correlatives of Neptune are indirect and implicit (since its period, with the accuracy accepted, fits just the remote series F_9) as the influence assigned it by Mythology; as though by oceanic spaces it masks the influence of Pluto and Proserpine, planets and conjugal couple.

Uranus, the "Sovereign of the Heaven" who restrains the Chaos, the engender of the gods and their activities, the planetary analog of the Sun [9].

The planet Uranus starts a new planetary series within the enveloping series of Proserpine where its harmonic is 6. Here, its factor (viz. symbol) equals to 1 and its revolution period becomes the main. So, by its harmonics, the Uranus transfers to this series the outcoming influence, but at smaller harmonics (relative to the series of)( ), and, hence, more efficiently but with a touch of its own influence. In this relation this planet is similar to Uranus-Heaven who engendered Titans and other creatures being full in variety, though these experiments had tired his wife and mother Ge (or Gaia). Parameters of this planet are as unusual, as the activity of the Uranus-Heaven. For instance, the period of this planet is located somewhere "above", in the series F_3, from where it governs the Uranian planetary series by "dividing the power" with the Saturn.

Titan **Kronos** (Gr. Chronos, all-embracing time) had seized the power (viz. the rhythm!) of his father Uranus by overthrowing him and his law in a brutal way (i.e. the Saturn's period roughly corresponds to Uranus rhythm). As his later double, **Saturnus**, he symbolizes earth, substance (time and space) being opposed to the heaven (idea), viz. the basic laws and their internal structure (e.g. recurrence of time) which predetermine the material processes of developing of life. In other words, he symbolizes efficacy that is obtained via the persistence and diligence, memory and storing through repetition; he is the symbol of the world-wide necessity, finite rigid judge: he "restricts" his father's "madness", but in a cruel way; being feared to be overthrown he eats his children.

A resembling influence could be found in the planet **Saturn**'s period which is the first after the Pluto's one that fits the auric unisons, thus specifying an actual infra-system focus through which the SA cycles and planetary periods are synchronized. And the battle of Kronos against Uranus finds its reflection in that the Saturn's period "tries" to brake the law of the Uranian series harmonic rhythms by a discrep-

ancy between its powerful auric unisons and rough correspondence to Uranus series with its period (that is with harmonic 3 of the period $T_{♅}$, which defines three main phases of cyclic development); for the actuality of this battle, see also [11].

Zeus (**Jupiter**) in terrible and persistent struggle overthrows his father, Kronos. Zeus, "The Bright Heaven", restores the hierarchy of power and the law of his grandfather, Uranus (remember, that the planet Jupiter originates new planetary series which is synchronous with the Uranus series relative to factor 7 corresponding to the world of ideas). He takes the stand of the main transmitter of the Space influence to Olympic gods and human beings (viz. internal planets – Mars, Earth, Venus), thus symbolizing the harmony of the Space Law on the last step of creating the world (viz. cycles). In compliance with his Olympic double, Zeus, who stirs a man's vitality and creativity, the planet Jupiter controls (e.g. gravitationally) the rest of the planets by virtue of vicinity of its first harmonics to their fundamental periods.

Mars (Ares) is as willful as his double's planetary period in the sense of not fitting the unisons (viz. the Order!), whereas its very close auric unison with the Saturn's period, $T_{♃}/3 = \varphi^8 \cdot T_{♄}$ (0.01%) might be understood as a restraining influence of the latter which requires setting of dynamic synchronism.

Ge (**Earth**) had engendered Uranus-Heaven and he married her. Since then, she becomes the dwelling place of the supreme gods (viz. farthest planets, starting with the Jupiter) and the battlefield where they struggle for the power (viz. where their harmonics interact), but **not a passive observer** since she is obliged to intervene in these interactions (viz. to come in resonance with their harmonics). Here, as well, we find the correspondence with the SPS model: most of measures accepted in our life fully correspond to the Earth's factors (e.g. 5, 6, 7, 12, and their multiples), the more so for the precise correlation with the Uranian series. Besides, the Earth, apart from Mercury, shows the most precise harmonic synchronism with the farthest planets and, in contrast to the Mercury, at the mutual factors, as if the Earth presents the Solar System influence crossroads (that is responds to the influence of the supreme gods).

Mercury (Gr. – Hermes) and **Venus** (Gr. – Aphrodite) did not play a governing part at Olympus (viz. on the Earth). And this situation presents a good correspondence to the planetary relations, since the Venus and Mercury periods are even less than the Earth's one. However, their influence is manifested in other things.

Venus is the symbol of harmony. Its planetary period is defined by the Golden Section relative to the Earthy year (with an error of $\delta = 0.46\%$) and fits the main Auric series F exactly in the middle between τ and T_0.

Mercury is the god's messenger; and the great values (and, thus, fuzziness) of the respective planetary harmonics in any series are quite adequate to the frequency

of changes and instability in behavior and influence being attributed to Hermes-Mercury.

By virtue of their influence and significance, **Apollon**, the god of Sunlight, harmony, philosophy, mathematics and predictions, as well as radiant god **Sun-Helios** are completely adequate to that part the Solar activity cycle and Solar rotation periods play in the Solar-planetary synchronism.

7.2. Music of Spheres

Apparently, it will not be mistaken to say that from the ancient times the music presents an integral part of any culture, and in any social system it serves for definite cult goals. While not paying attention to the rhythms which promote falling into brutal trance, consider that aspect of music which had excited the best minds of humanity. Since Pythagoras, music was considered as philosophy too; as well, he saw it as a reflection of the world in the light of number and rhythm. Take these ideas as the keystone for the further discussion.

Platonic understanding of music and space relations was based on the concept of "Harmony of Spheres" which brings the music, as scale and rhythm, into correlation with the Space in compliance with the idea that music gives the sound (or vibration) analogue of the planetary relations described by numbers, while the musical instruments reflect the heterogeneity of the Space that cause the vibrations. Consequently, the concept of "Music of Spheres" has come into existence, though nobody has specified exactly the idea about the structure of its scale and rhythms. For example, even such men of great intellect as Kepler and Euler were unsuccessful in describing the exact scale of fifths and octaves; as to phonation, one can easily note that whereas those rhythms and melodies which are accepted to present harmony between the people in one country, at the same time might be rejected as cacophony in another one, and vice versa.

Therefore, in order to conduct a correlation with the SPS via the Auric Time/Period Scale, make more exact the basic concepts of such phenomenon as music from the viewpoint of frequency and period.

(**M1**) From the times of Pythagoras, an "ideal" scale was attempted to be constructed by considering harmonics, viz. those frequencies whose ratios are close to ratios of small natural numbers (e.g. 1:2, 2:3, etc.). At this, irrational ratio (e.g. $\sqrt{2}$) was considered as inharmonious. As a result, such basic sound intervals as fifth and octave were defined which cover the frequency bands with maximal to minimal frequency ratios equal to $q=1.5$ and $Q=2$, respectively.

(**M2**) Selection or constructing of an instrument defines the timbre, viz. the frequency spectrum corresponding to the fundamental frequency of the respective tone (or note), or instrument as a whole.

(**M3**) If the scale and timbre specify, in some way, the stationary frequency characteristics, the music itself is understood as the unity of the rhythm, melody and

harmony, which specify sounding in dynamics, thus allowing to realize different combinations of rhythms.

Side by side with harmonic relations, the Golden section manifest itself not only in physical phenomena, but in the masterpieces of art and esotery (pyramids, etc.). The Golden section is not only pleasant for an eye, but, probably, this is why it is pleasant that expresses (in static) the basic laws of the Nature which define the rhythms of motion and development, whereas it does this more efficiently than harmonic relations. Therefore, we may suppose that behind the assimilating of sculpture and architecture to "hardened music" it probably stands the ancient idea of the Music of Spheres which in structural and dynamic relation reflects the Golden section not in less degree than the planetary series do. Hence, should the Hypothesis on the ATS be true, the Auric series (in common with the planetary ones) have to be reflected in the sound scale too.

As it is known, the piano is tuned so that the frequencies of the tones (viz. the Scale steps) of the same name (e.g. notes *do*) in adjacent octaves differ but exactly by factor $Q=2$. At this, the octave itself (or, more precisely, the frequencies) is divided by *12* equal intervals so that the ratio of the adjacent tones equals to $w=2^{1/12}$. Consequently, the frequencies of the sequential tones form the geometric progression with denominator w (remember, that the Auric series F form the progression with denominator Φ). For example, if the frequency of the tone *do* of the first octave is equal to f, we obtain the scale

C_1	C_{sh}	D	D_{sh}	E	F	G_{fl}	G	G_{sh}	A	B_{fl}	B	C_2 …
(*do*$_1$)												(*do*$_2$)
$f=fw^0$	fw^1	fw^2	fw^3	fw^4	fw^5	fw^6	fw^7	fw^8	fw^9	fw^{10}	fw^{11}	$fw^{12}=2f$

In this conventional European scale, for the notes with the same name the exact octave is obtained; e.g. for $C_2 - C_1$ and $D_2 - D_1$ we get, respectively

$$(f\cdot w^{12}) / f = w^{12} = (2^{1/12})^{12} = 2,$$
$$(f\cdot w^{14}) / (f\cdot w^{2}) = w^{12} = (2^{1/12})^{12} = 2.$$

Since we are interested in the ratio of frequencies, for simplicity (as for the Auric series) we can let $f=1$.

However, the exact fifth cannot be realized in this scale since the ratio being mostly close to $q=3/2=1.5$ yields

$$w^7 = 2^{7/12} = 1.498 \approx 1.5 \text{ within the accuracy of } 0.13\%, \qquad \text{(e.g. C – G)}$$

Hence, in order to bring this scale in relation to the Golden section, we are required, firstly, to find a tone being nearest to $\Phi = 1.618\ldots$ by frequency; but in this case the accuracy is even lower than for a fifth:

(G)	$w^7 = 1.498\ldots \approx \Phi$ (7.42 %)
(G_{sharp})	$w^8 = 1.587\ldots \approx \Phi$ (1.89 %)
(A)	$w^9 = 1.682\ldots \approx \Phi$ (3.94 %)
(B_{flat})	$w^{10} = 1.78\ldots \approx \Phi$ (10.1 %)

Therefore, the tone corresponding to the frequency Φ lies between G_{sharp} and A, whereas the pure fifth is significantly closer to Φ–interval than octave, but even more accurately Φ–interval coincides with the increased fifth, viz. C – G_{sharp} (with error 1.89 %).

The obtained relations allow to conclude the following.

1. As in the case with harmonics in the SPS, the conventional European music scale does not provide exact unison for a number of basic harmonics (fifth, third, etc.); however, this is not perceived by ear.
2. Within a conventional pitch, ***the pentatonic*** is the most exact (relative to frequency band) analog of the Auric scale. At this, though the increased fifth is more exact in reflecting Φ-interval than the pure fifth, the latter presents, in addition, the important harmonic interval.
3. By the structure of its scale, the pentatonic being used in the Eastern music stands nearer to Auric series than the European octave-based system.

Though the authors are not the musicians, they venture to develop the below conclusions by proceeding from general considerations relative to the rhythm and unison.

Let we have a possibility to tune an instrument in the required way, or to use an electronic synthesizer. Then, in compliance with the above considerations one may implement the following concepts (either all of them, or separately) with the aim to create an SPS-instrument and SPS-music which, probably, could bring us nearer to understanding of the essence of the Music of Spheres.

(**M1***) Re-tuning the scale.

In order to approximate the pure or increased fifth to Φ–interval it is required to refuse the "exact" octave. For example, if the same tuning error is remained for the fifth, but for another frequency $f_q = 1.502$, the error for the octave and increased fifth are

($C_1 - C_2$)	$2.00846 \approx Q = 2$ (0.4 %),
(C – G_{sharp})	$1.5919 \approx \Phi$ (1.6 %).

If, otherwise, G_{sharp} is approached to Φ within the accuracy of 1%, then

(fifth)	$1.5102 \approx q = 1.5$ (0.7 %),
(octave)	$2.0274 \approx Q = 2$ (2.7 %),
(C – G_{sharp})	$1.6019 \approx \Phi$ (1 %).

(**M2***) Selecting the timbre.
Since the timbre is defined by overtones, a natural SPS-analogy suggests itself: to specify the overtones with the planetary series harmonics (See Table 2); for instance, by the Uranus series:

$$R_{Uranus}=1,\ 3,\ 7,\ 8^*,\ 20^*,\ 42 \text{ or } 45,\ 84,\ \ldots,$$

where the SA and asteroid harmonics are marked by asterisk. At this, simultaneous use of all these series (viz. Uranus, Jupiter, and Proserpine) allows to create a kind of three-register organ with Aurically tempered pitch.

(**M3***)As to compiling music, we may also permit that whether it is used an SPS-instrument, or other one, the respective rhythm and melodies are expected to reflect the rhythms of the planetary and Auric series (e.g. Φ-rhythm, or pentatonic), including the R_3, R_4 synodic rhythms. However, this is already the sphere of creation for composers and performers.

8. General Approach to Verification of the Hypothesis on ATS Relative to Evolutional Time

The second assumption of the Hypothesis on Auric Time Scale states that the series F specifies exponential (relative to structure of the series F), or evolutional (relative to considering time as a sequence of events) time as a system of successive cycles which develop by similarity. From a numerical point of view, this implies that the duration of each successive cycle is decreased with respect to the preceding one in the Golden Section $\Phi = 1.6180339\ldots$, or with factor 2 (viz. octave) which specifies the least integer presenting harmonic similarity, in addition to natural one being specified by Φ.

It is obvious, that the best way to verify this assumption is to test it by using those statistical data that describe the evolution of the humanity. However, we are not provided with neither qualitative concept, nor numerical data that could be used for such testing. Indeed, though the "explosive" trends in demography, information supply and some other spheres of life definitely conform this thesis, the respective one-two century statistics is absolutely insufficient for obtaining generalizations over the millenniums.

So, *we have to specify a concept for such testing*. For this, by making use of the historical evidence and geophysical data that cover a period of several thousands of years, we shall seek for a synchronism between the trends and great events in these spheres and those separating epochs (viz. years) which determine the initial points of successive Auric cycles.

As to the source data, these are presented by a series of the greatest cosmogeneous and geophysical phenomena having been dated by the physicists and archeologists, a demographical statistics for China, which covers unprecedentedly large time interval of 2000 years, and a system of well-dated historical events being especially actual for the subject.

In contrast to concept of period, any type of existing historical time system orders the events; for this, in addition to setting of unvaried *time unit* provided for specifying the inter-event duration, some *origin* is to be selected. The Gregorian calendar is an example, where the birthday of Christ is taken for the origin, whereas the average tropical year is taken for the origin; for convenience, namely this calendar is taken below for dating the events. Almost each known calendar, as a historical time count system, uses the same unit – the Solar year, but as the latter does not contain an integer number of Solar days, a lot of problems arise in correcting the dates (e.g. taking account of leap-years) and correlating different calendars due to rounding of the tropical year to integer number of days. To this end, the only exception presents the Mayan Calendar (See below), where the count of days makes the essence of the calendar. At this, the calendars differ in the origin they use.

From this point of view, the ATS is not conceptually a conventional calendar, as it presents a sequence of decreasing periods

$$\ldots,\ D_0 \cdot \Phi^k,\ \ldots,\ D_0 \cdot \Phi^2,\ D_0 \cdot \Phi^1,\ D_0,\ D_0 \cdot \varphi^1,\ D_0 \cdot \varphi^2,\ \ldots, D_0 \cdot \varphi^k, \ldots$$

being specified by the series F and basic time interval D_0, where the origin might be set up by fastening of some separation point to the date t_0 of definite event. This selection of the values D_0, t_0 adjusts the ATS to unique exponential time count scale with the following separation points

$$\ldots,\ t_{-3} = t_0 - \left(\Phi^1 D_0 + \Phi^2 D_0 + \Phi^3 D_0\right),\ t_{-2} = t_0 - \left(\Phi^1 D_0 + \Phi^2 D_0\right),\ t_{-1} = t_0 - \Phi^1 D_0,$$
$$t_0,\ t_1 = t_0 + \varphi^1 D_0,\ t_2 = t_0 + \left(\varphi^1 D_0 + \varphi^2 D_0\right),\ t_3 = t_0 + \left(\varphi^1 D_0 + \varphi^2 D_0 + \varphi^3 D_0\right),\ \ldots .$$

Hence, should we have adjusted the ATS so that the separation points t_i, $(i = 0, \pm 1, \pm 2, \ldots)$, coincide with the greatest events in Nature and society, we would take grounds to testify the existence of exponential, or evolutional time; the more so, should this synchronism correspond, both qualitatively and numerically, to the conclusions of other independent concepts.

Finally, we may expect that it is namely the Auric Time Scale which may give some answer to the vital question as to possibility and terms of abrupt world-wide changes, as such instantaneous (relative to the history of humanity) perturbations might be appropriate just to exponential structure of the series F, but in the least degree correspond to the conventional concept of linear time development (or time count).

Therefore, the searched all-round synchronism in society is studied with respect to the following phases of non-linear (viz. Auric) development:
{1} Prolonged process of condensation of centers of civilization;
{2} Relatively short (with respect to {1}) period of engendering of new cultures in some of the above centers;
{3} Violent (with respect to time of {1} and intensity of {2}) flourishing and expansion of separate of the latter civilization(s), and, at last,
{4} Rapid (with respect to time of {1} and intensity of {2}) and unexpected decay and contracting (or disappearing) of the latter one(s).

Though we do not seek for the "physical" explanation for the discovered close distribution of the basic phenomena in Nature and society over the highly uneven ATS separation points, namely this synchronism definitely shows that on the level of possible events the forthcoming decade-and-a-half may present us a lot of global surprises.

9. Population of China as Indicator of World Trends

Among other surprising things, *China presents the census data (Table 5) which cover the unprecedented period of 2000 years*. For analytical studying, these data must be smoothed by some curve. For this, an approximation $p = 1/(0.0393 - 0.0000193y)$ is given in [10], which, for convenience, might be presented as follows

$$P = \frac{a}{c - y}, \quad a = 51813, \quad c = 2036.27, \tag{19}$$

where y is the Gregorian year, and P – population in millions of people (mp). Since the general census of population is now generally taken in the beginning of the year, assume that for each year the data in Table 5 is given for the January 1st. Then, the origin, viz. $y = 0$, corresponds to January 1, 1AD, whereas the year $y = -1$ corresponds to January 1, 2BX, etc.

Table 5. General Censuses for China Over 2000 Years [10]

No	Year of census	Enumerated population, N_i (mp)	Model (19) population, P_i (mp)	No.	Year of census	Enumerated population, N_i (mp)	Model (19) population, P_i (mp)
1	2	71	25	19	1974	908.60	832
2	88	43	27	20	1980	987.05	921
3	156	62	28	21	1981	1000.72	937
4	606	54	36	22	1985	1048.00	1011

5	705	37	39	23	1987	1080.00	1052
6	1014	60	51	24	1989	1112.00	1096
7	1103	123	56	25	1990	1133.68	1120
8	1393	61	81	26	1992		1170
9	1600	150	119	27	1994		1226
10	1700	150	154	28	1996		1287
11	1750	200	181	29	1998		1354
12	1751	207	182	30	2000		1429
13	1800	323	219	31	2005		1657
14	1850	430	278	32	2010		1972
15	1953	582	622	33	2015		2436
16	1964	650	717	34	2020		3185
17	1966	700	737	35	2025		4598
18	1969	806	770	36	2030		8264

The principal property of the function (19) is the break near point c, viz. at the epoch of 2036.27 which makes the year of 2036 plus 0.27 of a year, or April 7, 2036 AD (that is $0.27 \cdot 12$ months = 3 months and 7 days). Though this "exact" date has no real meaning since the function (19) is just an approximation, it shows, however, that when the argument y approaches the year 2036, the respective value of function $P = P(y)$ tends to infinity. At this, in contrast to the quickly growing function $Q = e^y$, which is frequently used as an exemplary model for "explosive" processes in Nature and society, the function $P(y)$ comes to infinity on a bounded segment $Y = [2036; 2037]$, whereas the function $Q = e^y$ – on the infinite segment. In other words, the growth of the exponent $Q = e^y$ (not speaking about polynomials and linear functions) is always limited on a bounded segment, while for any large value P_* there exists such a value y belonging to Y, that $P(y) > P_*$.

The above comments are required for the reader to understand that *physical realization of the process described by (19) or (21) is absolutely impossible within some close vicinity of the point c*. Therefore, it is necessary firstly to estimate the mathematical adequacy of the model (19) for the given source data; after then, it would be possible to estimate the year of bifurcation.

From the physical point of view, selection of China is also stipulated by some significant circumstances pertaining to this region. Thus, *China* (or, more precisely, the kernel of its historical territory) *presents especial interest as a world-wide indicator of cosmogenious factors of influence* being exerted to the Earth due to the very location of this country, and that is why *the population of China could be considered as the indicator of definite world-wide trends*. This hypothesis has been put forward and rather definitely testified in [10]; in brief, the arguments are as follows.

By diffracting on the globe, the electromagnetic Solar radiation gives a series of maxima, the frequency of the first of which coincides with the alpha rhythm of the brain. At this, high mountain ridges play the part of condenser of diffraction wave, that forms a "geographical" maximum, or additional source of energy. Really,

namely here, at both sides of Himalayas, we see the most inhabited areas in the world. As well, might be due to this factor the energy (prana?) accumulating exercises are widely developed namely in these regions.

Moreover, by taking account that the Earth is a ferro-nickel planet, or in some way a magnet, we get one more factor of interaction between the natural (seismic, etc.), and social and biological phenomena, the more actual now, the avalanche growth of population (and, hence, interacting energies) follows the hyperbolic trend (19). This leaves no other alternative for the society then seeking for harmony with the environment and itself.

10. Functional Model of Population of China

It is clear, that due to the influence of different natural factors (varying of territory, earthquakes, wars, etc.) the demographic data presented in Table 5 should be considered as such that are spread about some actual trend, but do not follow it exactly. Hence, in order to describe this trend numerically, we may present population as a function of year, which reflects the actual trend, but, inevitably, with an error pertaining to the source data.

From mathematical point of view, solving of this problem requires, firstly, to select a class of functions (viz. exponent, polynomial, etc.) being most appropriate for such approximation, and, secondly, to estimate the parameters which uniquely specify the appropriate function within the chosen class (e.g. parameters a and c for hyperbolic function of type (19)).

The first of these two tasks is generally not a mathematical problem, as the same data might be approximated by function being taken from different classes, but with the same accuracy. In other words, though selection of the class of approximating function predetermines the algebraic form of the result, this form does not present the result by itself, but the numerical response (within the area of the source data, or in its close vicinity) to the argument y; and this response has to be the same, within an error specified by the source data, for approximations φ, f being taken from different functional classes $\{\varphi\}, \{f\}$. In this case the approximation is called stable and the functions φ, f are considered to be equally accurate approximations of the source data. Therefore, as far as we are interested in revealing stable trends and numerical extrapolation in close vicinity of the source data, it would make no difference, what algebraic class for approximation is used, should this approximation be stable and provide the required accuracy.

The second task provides a routine mathematical problem that might be solved with the use of the Method of Least Squares (MLS); it allows to find such numerical values for parameters of the function of the given class that minimize the standard deviation (SD) σ_f which specifies the error for the considered problems; in other words, it describes the dispersion of the actual data against the smoothing function:

$$\sigma_f^2 = \frac{1}{n-1}\sum_{i=1}^{n}(N_i - f(y_i))^2 , \qquad (20)$$

where n – is the number of censuses, N_i – the actual population of China in the year y_i, and $f(y_i)$ – the "model" population being obtained as the value of the approximating function f for the same year $y_i; i = 1, 2, \ldots, n$. For example, given a functional class $p = a/(c - y)$ and census data (Table 5), the solution to this problem be presented [10] by the values a and c specified in (19).

Consider now those main qualitative and numerical trends which are specified by hyperbolic approximation (19), where *mp* denotes millions of people.

(**A1**) The standard deviation is $\sigma = 54$ (mp). This means that within the approximation interval of 2 AD to 1990 AD the average deviation of function (19) from the census data values N_i (Table 5) makes ± 54 (mp), and this value of SD cannot be significantly decreased by selecting other values for the parameters a and c, because they are chosen as such values that minimize the deviation (20).

(**A2**) The equation (19) defines that each successive doubling of population takes place over the two times less time interval, and vice versa: beginning with the date $c = 2036.27$, each successive (in the depth of centuries) decrease in population with the factor 2 takes place over the twice time interval. At this, instead of factor 2 any positive number, e.g. $\Phi = 1.6180339\ldots$ might be taken.

(**A3**) If we consider k phases of decreasing of population, each of them with the factor n, the total discrepancy of approximation would decrease by n^k times. This mean, that for the given data the accuracy of any approximation is determined mainly by the accuracy at the area of the last decades; but namely for this area the most exact and numerous data are given. In other words, "The future defines the past".

(**A4**) At the first stage, from 2 AD to the XVIII century, the population varied up and down relative to average value $N_{AV} = 63.875$ (mp). From a viewpoint of approximation, it is a normal situation, as the SD makes 54 (mp) and at this stage the period of doubling of population exceeds significantly the periods of natural factors of influence (e.g. fall of the Dynasty Min in 1644, and blooming of the Dynasty Cin that resulted in strengthening of autonomy). In general, this stage presents the phase of relative *stationary*, where the actual population is described by (19) just by an order of value.

(**A5**) Within the period of XVII-XVIII to the middle of the XX century, we see a non-stop growth of population which visually might be estimated as *linear*; within an accuracy of 30-40% the actual data at this stage are described by (19), which reflects the influence of both natural factors, and annexation of Tibet.

(**A6**) With much more precision, from 10% to 1% (at SD about 5%), the equation (19) reflects the population at present stage (from fifties to our days). And what

is more, the following trends are seen at this stage, which had never been registered before:

(**A7**) doubling of population, firstly in the history, has taken place over a period (from 1950 to 1990) being comparable with the duration of an average human life; viz. those, who was born after 1950, would survive (in average, or at least) one doubling of population;

(**A8**) near the year of 1950, it is clearly seen an inflection point in the census histogram, which specifies the origin of demographic "explosion" (might be due to growth of income which now makes 7% a year, and in spite of attempts to control the fertility). Besides,

(**A9**) actual growth of population, starting with 1969, even exceeds the values specified by hyperbolic (!) approximation (See Table 5).

Therefore, as the actual growth of population of China now approaches the hyperbolic function with the accuracy exceeding 1%, before the year of 2036 there should inevitably take place a bifurcation point T^*, as otherwise the population of this country would have grown to infinity in a period of 30 – 40 years.

Thus, by paying attention to exclusive actuality of this conclusion, analyze the stability and accuracy of model (19) by comparing it with the hyperbolic function of general view, as due to (A3) and (A9) no other functional class would provide adequate growth as hyperbolas do.

As it was shown, the equation (19) approximates the demographic data with sufficient accuracy of 1% at the stage (A6), but practically inadequate at the stage (A4) where the error exceeds 200%. In order to obtain more adequate approximation for all stages, consider the generalized class of hyperbolas

$$f = d + \frac{e}{c' - y} \quad , \tag{21}$$

that differ from (19) in the term d which describes the background level there, where the value of the second, hyperbolic, term is small. At this, for studying the stability of approximation (21), optimal values of parameters d, e are given in Table 6 for the series of years c' which provide minimal error (20), viz. standard deviation σ. The results presented in Table 6 allow to conclude the following:

(i) approximation (21) yields sufficiently (by 17%) lesser error of 46 (mp) against the value of 54 (mp) pertaining to (19);

(ii) all sets of parameters $\{e, d\}$ for the given interval of years $\{c'\} = \{2032 - 2040\}$, or $c' = 2036 \pm (2)$, provide practically homogeneous standard deviation σ and low error for all stages.

Table 6. Optimal Parameters for the Generalized Hyperbola (21)

c'	d (millions of people)	e	σ (millions of people)
2032	38.4	47111	46.6
2034	34.2	49211	46.3
2035	32.1	50260	46.20
2036.3	29.5	51594	46.22
2037	28.0	52362	46.3
2038	26.1	53412	46.4
2040	22.2	55516	46.8

Hence, approximation (21) is sufficiently stable and gives almost the same average value for c' as that in (19). Therefore, for uniformity with (19), the average parameter c' for (21) might be assigned the same value $c = 2036.27$, since the correction 0.27 does not attribute to the error of approximation.

11. Bifurcation Points as the Limits of Demographic Trends

In compliance with the Hypothesis on the evolutional time, if the ATS defines the sequence of periods with Aurically decreasing duration, they have to converge to some time point where definite social (and/or natural) phenomena may drastically change the situation in the world. That is why we call it the point of bifurcation T^*. However, as the situation may develop by steps, we would seek for this point as a set of bifurcation points being distributed at a short time interval.

This approach generalizes the Mayan concept of development of humanity, which implies that such bifurcation point does not denotes the end of the world, but rather the end of some supercycle which, in its turn, might also present a cycle within some greater structure of cycles, etc.

As far as both the Mayan (See para.12) and some other bifurcation points are either known, or could be obtained (as below, by demographic trends), establishing of synchronism between the candidates for the bifurcation points, auric structure of Mayan Calendar and major world events in Nature and society might be considered as explicit evidence for the Hypothesis on the ATS.

11.1. Candidates for the Bifurcation Points

We may take it for granted that the bound of adaptivity of population to qualitative and quantitative changes in the conditions of life is reached when doubling of population takes place during an interval of replacement of one generation, viz. over a period of about $T_G = 20$ years, or $I_G = 20 \pm 3$ years. The dates of starting and completion of this period denote T^*_{GS}, T^*_{GC}, and call the former the implicit bifurcation point.

Indeed, the above doubling may take place only when the growth of population approaches the hyperbolic trend, and, in this case, it would be hardly possible to imagine for the country to withstand such demographic explosion, as in compliance

with (A2) the following doubling would take two times less period (viz. 10 years), etc. The more so we are considering such a great country as China.

With respect to (19), the year T_{GS}^{*} is defined as follows

$$T_{GS}^{*} = c - 2\Delta, \tag{22}$$

where Δ is the accepted period of doubling of population. Then, the average and interval estimations for the period of doubling of population of China during the replacement of one generation make

$$T_{GS}^{*} = 1996,\ T_{GC}^{*} = 2016, \qquad \text{for } \Delta = 20;$$
$$I_{GS}^{*} = (1990 - 2002), \qquad I_{GC}^{*} = (2013 - 2019).$$

(**A10**)Hence, if the *first (implicit) bifurcation point* was passed in the middle of fifties (A7) and marked the transfer to evident hyperbolic growth of population, and the *second (implicit) bifurcation point* was passed approximately in 1996 (A10), we may suggest that the forthcoming (*third) bifurcation point* engendered by demographic trend would explicitly demonstrate itself, in average, in 2016, or during 2013 – 2019.

The obtained estimates are supported by the following independent conclusions:

(**A11**) As it is shown in [11], the beginning of the Age of Capricorn, which is defined by orientation of the Earthy axis, Solar apex and other factors, is estimated as the date not exceeding the year of 2001 AD, that is literally by our days: and *this is namely the Age of Capricorn that comes and carries contraction,* and not the Age of Aquarius.

(**A12**) Some estimations [7] tell that we may expect the forthcoming Solar activity maximum epoch to take place in 2002 – 2006 (or, in average, in 2003), and in 2012 – 2016 (or, in average, in 2014). At this, the first of these two epochs is combined with the powerful influence the Uranus would exert from Aquarius (where it resides until 2004). The previous coincidence of this type took place in 1917. But these times the influence of Uranus is strengthened as it rules Neptune residing in Aquarius and, implicitly (via Jupiter and Neptune) – Pluto.

To this end, breakdown of the USSR and communism in Europe in 1989 – 1991 at the Solar activity maximum [12] might well be likened to prologue of drama, apotheosis of which could be played in 2001 – 2004, as manifestations of Russia's revolution of 1905 (at SA maximum) had developed to the revolution of 1917 (at SA maximum, once again) after the Uranus had asserted in Aquarius.

(**A13**) However, this time we may expect even more dramatic development of the events, because more factors of influence are vigorously [12, 13] put into effect from the very beginning of development of the current 11-year cycle of Solar activity

to be crowned at the SA maximum manifestations. Therefore, two more resonance intervals for the bifurcation points could be specified: 2002 – 2006, and 2012 – 2016.

11.2. Preliminary Analysis of Evolutional Cycles

Consider stability of models (19), (21) with respect to their correspondence to the main trends. For this, synchronism is studied between the cycles in which the population grow with the factor $m, \{m = 2, or\ \Phi\}$, and some natural phenomena.

11.2.1. In order to obtain a sequence of cycles, consider the origin by taking for the reference point the average $N_{AV} = 63.875$ (mp) of the actual population at the stationary stage (A4). After then, with the use of (19) calculate the years (See Table 7) that correspond to those levels of population which increase with factor $m, \{m = 2, or\ \Phi\}$, that is

$$P_0 = m^0 \cdot N_{AV} = N_{AV},\ P_1 = m^1 \cdot N_{AV},\ P_2 = m^2 \cdot N_{AV},\ \ldots;\ (y_k = c - a / P_k;\ k = 1,2,...)$$

Table 7. Doubling and Auric increase of Population for the Reference Point Complying to the Stage of Stationary (Years are determined with respect to (19))

Order of increase: $m=2$			Order of increase: $m=\Phi$		
Cycle No. k	Population, $P_k=2^kN_{AV}$ (mp)	Year y_k defined by P_k via (19)	Cycle No. k	Population, $P_k=\Phi^kN_{AV}$ (mp)	Year y_k defined by P_k via (19)
0	63.875	Stage (A4)	0	63.875	Stage (A4)
1	127.75	1630	1	103.35	1535
2	255.5	1833	2	167.23	1726
3	511.0	1934	3	270.58	1844
4	1022.0	1985	4	437.81	1918
5	2044.0	2011	5	708.38	1963
6	4088.0	2023	6	1146.19	1991
7	8176.0	2029	7	1854.57	2008
			8	3000.76	2019

(**A14**) Analysis of Table 7 shows that:

(i) in the middle of the XIX century it takes place a simultaneous completion of the second doubling (1833) and third auric (1844) cycles, which is reflected in abrupt growth of population (See Table 5), and synchronism with the epoch (1861) of the global auric cycles (Table 10); besides,

(ii) almost simultaneous completion of the fifth doubling (2011) and seventh auric (2008) cycles approaches the date of expiring of the Mayan Calendar, after which the population of China is to double in 12 years.

11.2.2. By taking account of the above results, conduct the same analysis for the model (21), but consider for the reference point the origin of the Mayan Calendar (viz. 3113 BC). Note, that due to relatively high value of the parameter d, the number of cycles in this case is lesser. From the other hand, use of Table 6 allows to estimate the error for the separation epochs. The obtained results are presented in Table 8, where $N_{OM} = 40$ (mp) is the population of China relative to (21), which is averaged with respect to Table 6.

Table 8. Doubling and Auric increase of Population for the Reference Point Complying to the Origin of the Mayan Calendar (Years are determined with respect to (21))

Cycle No. k	Order of increase: $m=2$	Order of increase: $m=\Phi$
	Year defined by population $N_{0M} \cdot 2^k$ via the (21)	Year defined by population $N_{0M} \cdot \Phi^k$ via the (21)
0	Origin of the Mayan Calendar, 3113 BC	Origin of the Mayan Calendar, 3113 BC
1	1004 ± 107	552 ± 138
2	1638 ± 46	1346 ± 80
3	1857 ± 21	1665 ± 43
4	1951 ± 9	1824 ± 25
5	1995 ± 3	1911 ± 14
6	2015 ± 1	1961 ± 8
7		1990 ± 4
8		2008 ± 1.7
9		2019 ± 0.2

(**A15**) analysis of Table 8 shows that:

(i) within the last century, the separation epochs for the auric scales practically coincide with those of Table 7, which is especially actual with respect to (A3);

(ii) relative to doubling of population, Table 8 yields the same critical epochs (1951, 1995, 2015) as were revealed in (A10).

Therefore, we may conclude that the approximations (19) and (21) are equally stable with respect to Auric cycles. This allows to use the former, as more simple, in further analysis; definite discrepancy is caused by difference in origins and explained below.

12. The Mayan Factor and the Auric Time Scale

12.1. The Mayan Calendar

The miraculous Mayan Calendar (MC) still continues to astonish us with the hidden facets of its numerical structure (apart from astronomical and other ones) which is closely connected with evolutionary concepts [1]. In addition to its integer cycles, it also grounds on the Auric Time/Period Scale. To this end, the following properties of this calendar present importance for the below considerations.

***** The basic cycles of the MC are engendered by the initial terms of the Fibonacci numbers of the basic **u** = *2, 3, 5, 8, 13, …* and adjoint **v** = *3, 4, 7, 11, 18, …* series by their products and fractals (e.g. 20, 260, 360, etc.).

* **The peculiarity of the MC consists in exact counting of days in units of Tzolkin (C=260), Tun (S=360), and their fractals and products; it is namely this feature that makes the basis of count of time in the MC. At this, the ratio of these basic cycles makes the value *360/260 = 36/26 = 18/13* $\approx$*1.385* being equal to the difference *2-* φ *= 1+* $\varphi^2 \approx$ *1.382* of the basic evolutional factors (*2* and φ) of the Mayan Calendar to within an error of *0.1%* (!) which could be neglected while comparing a relation of two such small integers with an irrational number φ.**

* ***The complete period*** N_M **(in days) of the Mayan Calendar comprises *13* Baktuns of *144 000* kins (viz. days) each:**

$$N_M = 13 \times 144\,000 = 1\,872\,000 \quad \text{(days)} . \qquad (23)$$

Since the average number of days in a tropical year equals $N_0 = 365.2422$**, *the duration of period*** N_M **(in years) makes**

$$T_M = N_M / N_0 = 5125.3661 \quad \text{(years)} , \qquad (24)$$

or 5125 complete average years and 134 days. Note, that these numbers also present the periods belonging to the ATS, viz. $N_M = \Phi^{30}$ **and** $T_M = u_{18}^* = 5168$ **within the accuracy of *0.6%* and *0.8%*, respectively.**

* **In addition to its main (exoteric) structure based on Tzolkin (*260*) and Tun (*360*) cycles, we may see that the internal (or esoteric) evolutional structure of the Mayan Calendar is based not only on the Venus cycles [2]; almost exactly the periods** T_M **and** T_{δ} **(See Table 2) satisfy the equations** $T_M = 61 \cdot T_{\delta}$ $(\delta = 0.006\%)$**,** $T_M = 2\Phi^{10} \cdot T_{\delta}$ $(\delta = 0.8\%)$**; besides, the period** T_M **presents the 10-fractal of the average basic period** $T_{\oplus}$ **of the Solar System,** $T_M = 10 T_{\oplus}$ $(\delta = 0.1\%)$**, or** $T_M \approx 10 \cdot 2^9 \approx 10 \cdot \Phi^{13}$**.**

* **The MC is closely connected [1] with the exponential scale 2^k, and, through it, with the 64-element genetic code and I Ching (Book of Changes).**

* **Expiring of the Mayan Calendar is associated [1] with evolutionary rise/shift in the human consciousness, which is supposed to be caused by synchronization of all forms of the Earthy life. The culmination of this synchronization that would be engendered by cosmogeneous factor of influence at the end of the MC is expected to be preceded by substantial changes which**

would take place throughout the world during a relatively short interval being comparable with one generation (about 19 years, with respect to Maya). That is why knowing of the last Gregorian date of this Calendar might be considered as quite actual.

*** The Gregorian dating of the first year of the Mayan Calendar was performed on the basis of historical, astronomical, and archaeological investigations and specified in bibliography rather definitely as the year of 3113 BC [1, 2]. Moreover, even such quite narrow interval of dates as August 6 – 13, 3113 BC has been grounded for the first day of the MC. However, such accuracy is not inherent even for the year of expiring of this Calendar, which is now erroneously taken as 2012 AD - might be due to a frequent error being caused by improper calculation of duration of periods that cover the separation point between BC and AD (viz. the moment between the dates December 31, 1 BC and January 1, 1 AD). To correct this mistake makes one of the goals of this work.**

Correct now the date of expiring of the Mayan Calendar. While considering the aforesaid starting dates, pay attention to August 6, 3113 BC, as this day is also specified by the Golden section. Indeed, by dividing a tropical year N_0 in this section, we obtain $\varphi \times N_0 = 225.74$ (days). Then, if the 23rd of December, that is the first "complete" day after the average day of Solstice (presenting the "zero" day being used in the Mayan calculation), is taken as the first day of the natural Solar year, then, the 226th day comes, in average, to the 5th of August. Hence, the 6th of August – is the first day of the second part of the Golden section of the natural Solar year.

Take this Gregorian date t_F = *(August 6, 3113 BC)* as the first day of the Mayan Calendar and define the Gregorian date of the last (viz. N_M-*th*) day of the MC. Most exactly this could be done with the use of the Julian Day (JD) count which presents count of days since January 1, 4713 BC at Greenwich noons (viz. Mayans' Sunrises). There were *148* days that elapsed in 3113 BC since Greenwich noon of August 6 till the noon of January 1, 3112 BC. The latter noon is specified astronomically as the year *–3111.00* for which the per-year Table of Julian Days [14] gives the *JD # 584 765*. Hence, the Julian Day d_F for the first date t_F of the Mayan Calendar equals to

$$d_F = 584\,765 - 148 = 584\,617 \quad \text{(JD)}\,, \qquad (25)$$

whereas the Julian Day d_L for the last date t_L of the MC is simply defined by the duration of the Mayan Calendar:

$$d_L = d_F + (N_M - 1) = 2\,456\,616 \quad \text{(JD)}\,.$$

Now, the Gregorian date t_L corresponding to d_L could be easily obtained from the Michelsen's Ephemeris for the 21st Century as the date specified by Julian Day D_L being equal to the difference

$$D_L = d_L - 2\ 415\ 020 = 41\ 596 \text{ (JD)},$$

that specifies count of days starting with January 1, AD 1900. This gives that

Gregorian date t_L for the last day of the Mayan Calendar is November 19th , 2013!

In other way, the final date for the MC might be obtained by calculating the date of elapsing of the period T_M that starts on t_F = *(August 6, 3113 BC).* In this case, *3112* complete tropical years and the abovesaid *148* days *elapse* from t_F to 24hr of December 31 of the year 1 BC. Hence, the remaining part of the period T_M, which lies in AD, equals to

$$T_{AD} = T_M - (3112 + 148/365) = 5125.3661 - 3112.4055 = 2012.961 ,$$

that is *2012* complete years and *351* days. However, since this is not a year, but time interval, *in this case the Mayan Calendar also terminates not in 2012 AD, but on the 351st day of the year of 2013, viz. on the 17th of December, 2013 AD.*

Notes

1. The former estimate, *November 19, 2013*, must be considered as much more exact, since it is based on exact count of days pertaining to the Mayan Calendar system, whereas the latter one, viz. December 17, 2013, is based on averaged years and biased by the leap-year corrections, etc. Nevertheless, both of them give the same qualitative result – the end of the year of 2013 AD.

2. If the first date, viz. August 6, 3113 BC is shifted by $\pm n$ days, the last date will also be shifted by $\pm n$ days. For example, if August 13, 3113 BC is taken for the first day of the Mayan Calendar, the last day falls to November 26, 2013 AD.

3. Therefore, accepting any date of January 1 to September 17 of the year of 3113 BC for the first day of the Mayan Calendar causes this Calendar to expire in 2013 AD, and even in 2014 AD, if this date exceeds September 17, 3113 BC.

12.2 The Auric Epochs of the Mayan Calendar and The Outstanding Geocosmic, Demographic and Spiritual Phenomena

The below verification of the Hypothesis on the ATS is based on establishing of synchronism between the distribution of the events, which present the global sets of events in Nature and society, over the separation epochs of the Auric cycles of the Mayan Calendar. In compliance with both the

ATS-approach and esoteric concept of Maya [1], this synchronism implies the evolution to present the accelerating process which, in some ways, is initiated by cosmogeneous factors of influence and covers both informational and material spheres of life. Meanwhile, among the latter ones the informational factor is considered as dominating idea that implies emergence of new ideas and knowledge (from Theosophy to geography) and, together with the geophysical factors, is reflected in material sphere and social phenomena.

That is why search for a synchronism in further consideration is carried out with regard to the known global trends and events of worldwide importance in the following spheres:

- **Global natural cataclysms and Space phenomena;**
- **Coming of Great Teachers of humanity, as well as outstanding philosophers and scientists;**
- **Originating of calendars (as Time/Space systems);**
- **Demographic trends (specified by population of China, as an indicator of world trends);**
- **Forming and interaction of worldwide religious/philosophical systems and States.**

Fix up the reference point to the origin of the Mayan calendar by using the algebraic scale of years (ay); with respect to (19), (21) this yields

$$\tau_M = -3111.382.$$

Note, that 1 (ay) = January 1of the 1 AD; 1.5 (ay) = 1 (ay) + 0.5 (ay) = January 1 of the 1 AD + 0.5 (year) = July 1 of the 1 AD; 0 (ay) = January 1 of the 1 BC; etc. Then, January 1, 3113 BC makes –3112 (ay), whereas August 6, 3113 BC is the date being almost $\varphi = 0.618...$ ***of a year nearer to our time, and, hence, the date of the origin of the MC makes*** $\tau_M = -3112 + 0.618 = -3111.382$ ***(ay).***

For the last, *m-th*, point take the date of completion of the MC, where *m* is the number of Auric cycles we would like to consider within the period T_M **of action of the Mayan Calendar. The duration of each of these evolutional cycles**

$$\varphi^0\tau_m = \tau_m,\ \ \varphi^1\tau_m,\ \ \varphi^2\tau_m, \ldots,\ \varphi^{m-1}\tau_m;\quad (\varphi = 1/\Phi = 0.618...) \qquad \textbf{(26)}$$

decreases with respect to the preceding one by the factor of φ**. Here,** τ_m **is the duration of the first of them, which is defined by the normalizing equation**

$$\tau_m = T_M / \sum_{i=1}^{m} \varphi^{i-1}. \qquad \textbf{(26')}$$

For the given origin τ_M, the succession of the periods satisfying (26), (26') specifies the Gregorian years (27) of beginning of cycles, that are called the (Auric) separation epochs of the intra-calendar system of cycles. Thus, for $m=1$ we obtain one cycle with duration being equal to T_M and two separation epochs determined by 3113 BC and 2013 AD, that is the Mayan Calendar as a single cycle. With regard to number *3* as a general factor of development in time, consider the case $m=2$ that defines two cycles (the first pair of columns in Table 9) with *three Auric epochs*, one of which (*56 AD*) being the internal separation epoch. For the same reason, consider the case $m=3$, that defines *three cycles* (the second pair of columns in Table 9) with two internal separation epochs (viz. *550 BC* and *1035 AD*).

Besides, by taking instead of Φ the factor *2* being not less actual for the MC and ATS, we obtain *three epochs* that defines two cycles (the third pair of columns in Table 9) with exactly the same (*550 BC*) internal separation epoch.

Table 9. Intra-calendar Auric Separation Epochs (in Gregorian years) of the Evolutional Cycles for the Mayan Calendar

Number of intra-calendar cycles (*m*) and Factor of decrease of duration of cycles (*k*)						Design. of the epoch
m=2, k=Φ		*m=3, k=Φ*		*m=2, k=2*		
Epoch No.	Epoch	Epoch No.	Epoch	Epoch No.	Epoch	
0	3113 BC.	0	3113 BC	0	3113 BC	
		1	**550** BC	1	**550** BC	**X**
1	**56** AD					**Y**
		2	**1035** AD			**Z**
2	2013 AD	3	2013 AD	2	2013 AD	

By using the model (19) of population of China as a cosmogeneous indicator of demographic trends (further referred to as population), calculate the population for the date τ_M. This gives the value $P_M = 10.07$ (mp) which is presented in Table 10 (2nd column, 0-cycle line). Then, in the same way as in the Sec. 11, firstly calculate the population $P_k = P_M \cdot \Phi^k$ (column 2 in Table 10) for demographic cycles ($k = 1,2,...$), and, secondly, with the use of (19) calculate the model years Y_k (column 3) corresponding to the obtained above population P_k. At last, calculate two more cycles $(k = -1, -2)$ preceding the MC; for this, decrease the population P_M by Φ and Φ^2 times, respectively, and, then, repeat the second step. It is obvious, that the procedure of obtaining of the points Y_k, *(k = -2, -1, 0, 1,…),* does not provide them, by itself, with any structure that has something in common with the internal Auric epochs of the Mayan Calendar except the origin.

Independently of the above computations, calculate τ_m for the same number of intra-calendar auric cycles for the period T_M in order to mate the number of cycles in all columns. As a result, we come to the structures where the number of cycles and/or epochs is defined by the quantities ***12***, ***13***, and ***14***, which present the key numbers of the Mayan Calendar. The separation Auric epochs t_k, $(k = -2, -1, 0, 1, ..., 11)$, for these cycles

$$t_{-2} = \tau_M - \Phi\tau_m - \Phi^2\tau_m, \quad t_{-1} = \tau_M - \Phi\tau_m, \quad t_0 = \tau_M,$$
$$t_1 = \tau_M + \varphi\tau_m, \quad t_2 = \tau_M + \varphi\tau_m + \varphi^2\tau_m, \quad \dots, \quad t_{11} = \tau_M + T_M, \qquad (27)$$
$$\left(\Phi = 1/\varphi = 1.6180339...\right)$$

as well as epochs of Table 9, are given in column 4 of Table 10. Below these numerical data the most actual events relevant to the above specified five spheres of interest are presented.

Table 10. Separation Epochs of Auric Cycles for the Mayan Calendar and their Synchronism with Global Geocosmic Phenomena, Demographic Trends, and Development of Consciousness

k – the separation epoch and cycle number (k= -1, -2 – the epochs and cycles which precede the MC)			
	P_k – Population of China to the epoch number k, $P_k = P_M \cdot \Phi^k$ (millions of people)		
		Y_k – the Gregorian year that is defined by the population P_k via (19), viz. $Y_k = c - a / P_k$	
			t_k – separation epochs (27) of Auric cycles of the MC
k	P_k	Y_k	t_k
-2	3.85	11 434 BC	**11 446** BC
Epoch of termination of the *last glacial era* (XII-th millennium BC) Flash of **Supernova***;* **Geomagnetic inversion** (second to the last); Intensification of *earthquakes and volcanic* activity (XIII – XI millenniums BC) Change in surface of the Central Asia (XI-th millennium BC)			
-1	6.22	6294 BC	**6296** BC
Flash of **Supernova***;* **Geomagnetic inversion** (next to the last); Growth of concentration of *precipitated uranium* (VIII – VII millenniums BC) Birth of **Zoroaster** (6194 BC – by Aristotle) Epoch of ruin of **Atlantis** (by Platon) Epoch of "Creation of the World" (by Augustine et al.)			
0	10.07	3113 BC	**3113** BC

The last **geomagnetic inversion** (3.2 – 2.9 millenniums BC)
Total Solar eclipse at vernal equinox (3306 BC)
Beginning of the **Kali Yuga** (about 3100 BC)
Beginning of the **Mayan Calendar** (3113 BC)
Emergence of **Sumarian** civilization and **Babylon** (about 3000 BC): in those times they were provided with the star ascending tables and (at least, since 2500 BC) they used the Solar-Moon calendar
Up to the epoch of 3000 BC (since 4000 BC), the heliacal rise of *Sirius in Memphis* was the "exact" calendar for flood of Nile
Krishna, his era and record of the legend – over 3000 BC
Vyasa, founder of **Vedanta** (about 3100)
Fu-Si (about 2852 BC) and his heirs had found and expanded the **Chinese** *Empire* up to the Eastern Sea, ordered the *calendar* that was later being further improved during the centuries; as well, he discovered the *trigrams* that were further developed (See below) to **I Ching** in the Age of Confucius
Yudistir (died in 3101 BC) – founder of the Indrapresht, on the ruin of which **Delhi** was built in the XVII-th century (See Akbar, below)

1	16.28	1147 BC	**1146** BC

Significant intensification of the *tectonic activity* coincides with growth of concentration of precipitated *uranium* (about 1200 BC)
The *Golden section of the Mayan Calendar* (from the end to the beginning), 1155 BC
Fall of **Troy** (1194 BC)
End of the age of creating of the **Mahabharata** (1500 – 1200 BC)
Discovering of *Tibet and China* by the Europeans
Beginning of the *Iron Age* (1200 – 1180 BC)
Ramszes II (1314 – 1200 BC) establishes the *Calendar* of "lucky/unlucky" days

X			**550** BC

Coming of the Great Pleiad of the Initiate Adepts and thinkers:
Gautama Buddha (621 –544 BC)
Historical **Maitreya** (V-th century BC), Mahatma, successor of Gautama Buddha
Zoroaster (VI-th century BC)
Pythagoras (570 – 496, or 582 – 507 BC), Initiate, the most known of the mystic philosophers
Platon (427 – 347 BC), Initiate, the greatest European philosopher of the before-Christian Age; he reflected the Ideas of Vedanta and Pythagorean concepts
Herodotus (birth about 484 BC), the most exact of the historians, the founder of the European historical science
Anaxagor (about 500 – 428 BC), famous Ionian philosopher; one of those who firstly disclosed the secret Pythagorean concepts
Anaximandr (610 – 546 BC), the first who put forward the concept of evolution of the human beings
Lao-tzu (VI-th century BC)
Confucius (551- 479 BC)
Destruction of the **Jerusalem's Temple**, **Babylonean Capturing** (588 BC);
Final **fall of the Babylon** (539 BC) being one of the richest countries and the hearth of science and culture
Greece makes the Eleusics (viz. initiations) the source of profits (520 BC)
The Phoenician expedition had firstly gone around Africa (in the middle of th VI-th century BC) and was surprised by the anti-clock-wise movement of the Sun
Iran established a Zoroastrian calendar of Egypt type (VI – V centuries BC)
Solon (640 – 560 BC) established (in 593 BC) the first regular Solar-Moon Greek calendar which was edited by
Meton in 432 BC
Phales of Miletus (625 –547 BC), the first in Europe being known by name who predicted the Solar eclipse
Creating of **I Ching** (VI-th century BC) – the **book #1** in the Chinese history and culture, which is closely associated with the binary structure (**2^6=64**) of the *Mayan Tzolkin*

Starting from here, all the below years relate to Anno Domini

(Y) 2	26.35	69 AD	(56) **71** AD

Engendering of the **Christianity**; first persecutions of the Christians
Apostle **Paul**
Buddhism in China (65); great Chinese movement to the West
World wide Hebrew massacres (65)
Destruction of the **Jerusalem's Temple** (70)
Eruption of **Vesuvius** (79)
Migration of Huns; Starting of the Great *transmigration of peoples* in Eurasia
The age of **Sak (**78) – beginning of count of days in the national **Indian calendar** being officially accepted in 1957
Apollonius of Tian (Birth in the beginning of the 1st century AD, lived for about 100 years), Initiate, earnest devotee of Pythagoras, the most famous historical personality of the *"Age (viz. century) of Miracles"*
Simon Magus (1st century) – the second, after **Apollonius** famous Gnostic and magician who was called "The Great God's Might"
Claudius Ptolemaeus (end of the 1st century – middle of the 2nd century) – the creator of Almagestum and geocentric system which were used in astronomy until *Copernicus*, and the author of the Tetrabiblos, the outstanding role of which in astrology is not exhausted until our days

3	42.63	820	**823**

Earthquakes in Iran in 856 (200 000 victims) and in 893 (150 000 victims)
The miraculous **disappearance of the people of Maya** (830)
Beginning of the *Kiev's Rus* (See below)

(944)Z			(944) **1035**

Flash of **Supernova** (1054)
Birth of the historical **Quetzalkoatl (Kukulcan)** (947)
Igor's (*Kiev*'s famous duke) campaign against *Byzantium* (944),
Baptism of *Kiev's Rus* (988)
Starting of *Indian and Himalayan* campaigns of *Mahmud* (1001 – 1013)
Tibet-China war (1015)
Mongolia establishes the *calendar* relevant to Chinese analogue (1027)

4	69.98	1285	**1287**

Earthquakes in Asia Minor in 1268 (60 000 victims) and in China in 1290 (100 000 victims)
Dissemination of Zen-Buddhism in Japan (XIII-th century)
Invasion of Mongols in China, Japan, Java, Punjab (1276 – 1293)
Foundation of the Parliament in *England* (1265); Origin of the *Ottoman Empire* (1288), *Moscow* (1276) and Lithuanian (1293) Princedoms
Proscription of *Hebrews* from England, *Christians* from Palestine (1290 – 1291)
Decay of new *Maya*

5	111.61	1572	**1574**

The most terrible (relative to victims – 830 000) **earthquake** on record in the world, China, 1556 Dreadful epidemic of plague in Europe (1563) at great conjunction of Mars, Jupiter and Saturn Flashes of **Supernovas**: in **1572** (Tycho Brahe) and in **1604** (Kepler) *Europe*: beginning of *Renaissance*, development of capitalism, *Reformation* and dissemination of *Christianity* over the world, establishing of world-wide empires, great geographical discoveries of 15 - 16 centuries *Asia*: flourishing of the *Mogul* empire of the emperor **Akbar** (1542 – 1605) being called "the Solomon of India" Flourishing and reformation of *Moscow* and Lithuanian Princedoms into kingdoms (1547, 1572, respectively); subjugating of *Siberia* by Ermak (1582) Massacre in Vassi (1560), uprising of Huguenots in France (1567), *Massacre of St. Bartholomew* (1572), Religious riots in *Japan* (1571), *London*'s punishment (1588) Dissemination of **heliocentric world outlook**: **Copernicus** (1473 - 1543), **Tycho Brahe** (1546 - 1601), **Giordano Bruno** (1548 - 1600), **Galileo** (1564 – 1642), **Kepler** (1571 – 1630)			
(1718)			(**1718**)
A series of most destructive **earthquakes**: Caucasus, 1667 (80 000 victims); Italy, 1693 (60 000); Iran, 1727 (77 000) Storm of **Potala** (1717); Manchurian Dynasty subordinates the *Tibet* (1720) Reformation of *Russia into an Empire* (1718 – 1721), the first general census Discovery of the *Easter Island* and its monuments (1722) – the only remains of **Lemuria** Creation of *physical and mathematical foundation for the sciences*: **Newton** (1643 – 1727), **G.W. Leibnitz** (1646 – 1716) et al.			
6	180.60	1749	**1752**
A series of most destructive **earthquakes**, tsunamis and typhoons: India, 1737 (300 000 victims); Portugal, 1755 (70 000); Italy, 1783 (50 000) Starting of industrial revolution and flourishing of the *materialistic science*, disappearing of feudalism in Europe and forming of *colonial empires* Beginning of raids of Ahmed-Durran to *India*, riots in *Mongolia* and *China* (1747), intestine wars in *Java* Island (1750). Seven Year's war, British-French wars in America, India; taking of Pandishery by British troops (1750 – 1763) Discovery of **Uranus** (1781)			
7	292.21	1859	**1861**
Beginning of the age of triumph of materialism, pragmatic ideology and science **Helen Blavatsky** (1831 – 1889) – publication of the **Secrete Doctrine** Abolition of serfdom in *Russian Empire* (1961), the last serfage in Europe and on the 1/6 part of the land Wars, revolutions, riots occur in many places on the ideological and religious grounds (1845 – 1875) Theoretical prediction and discovery of **Neptune** (1846)			
(1901)			(**1901**)

The epoch of beginning of ***the last evolutional cycle*** (1901 – 2013, viz. *the XX-th century*) ***within the 7-phase Auric structure of the Mayan Calendar***, which defines the period of continuous and accelerating reorganization of the world as a unitary system, both in material and ideological spheres
The period of ***the most destructive earthquakes*** (See Para. 12.3)
"*The **twentieth century** has laid up for the humanity **very strange events**, and it may even happen for this century to be the last one"* [15]

8	427.88	1926	**1929**

The age of Pluto – that is of nuclear power, world wars and world-wide cataclysms in both material sphere and consciousness
Discovery of the planet **Pluto** (1930) in this cycle is directly accompanied by the *reaction of the Pluto the Sovereign of the underground kingdom:* during the period of 1920 to 1935 there took place **5 of 21 the most destructive earthquakes over the 1140 years** of registration that seized about 650 000 lives, the **world-wide economical crisis**, the **world war** that took away about **50 000 000** people, ideological *split of the world community onto two systems with nuclear weapon threatening*

9	765.08	1968	**1971**

Earthquakes: *Peru*, 1970 (66 000 victims), ***China***, 1976 (from **255 000** to **655 000**); *Iran*, 1990 (50 000)
The age of collapse of consciousness, as inability to adapt to the consequences of frontal breach into unprecedented spheres of knowledge and technology, which makes the man the hostage of his achievements. Firstly, this is *global computerization* and informatization of life; *exploration of the Space* (flights to other planets, space stations, *militarization of the space*). Then, ecological and technological crisis: exponential growth of knowledge and technologies exceeds the human ability to monitor the consequences; epidemics in developed countries (AIDS, etc.)
Dissemination of the Eastern philosophy to the West, and Western logic and technology – to the East

[***1987***] **Flash of Supernova** SN1987A in 1987 (See Para.12.3)

Intensification of technological, natural and ideological cataclysms: **Chernobil** Catastrophe, problems with utilization of chemical and nuclear wastes, heating of the atmosphere, seismic/volcanic drift of the Pacific platform, growth of ozone holes, etc.
Ruin of the communist world. Continuous political and armed world-wide confrontation on the ideological and religious bases

10	1238.05	1994	**1997**

Establishing of **new world** order presenting **misbalance** on the background of demographic "explosion" and global (natural, social, and technological [11 – 13]) cataclysms, the development of which is intensified with coming of Saturn to the Taurus (March 1, 1999)
Unprecedented (since WWII) **military action in Europe** begins *exactly **at the comet Hale-Bopp Time Focus** on March 24th*, 1999, that was previously manifested by military conflicts and riots in Albany (1997) and Kosovo (1998)

11	2003.26	2010	**2013**

The end of the Mayan Calendar

NOTES.

1. P_M – population of China obtained (19) to the epoch $\tau_M = -3111.382$, viz. August 6, 3113 BC.
2. In brackets, the separation epochs are given for the 7-phase system of cycles for MC which differ significantly from the considered 11-phase (with 12 epochs) system of intra-cycles; they are actual since the number 7 is as actual in count of Time, as the number 3. Remember, that 12 is the harmonic of the Earth in the series of Jupiter, and 7 – is the Earthy factor in the series of Uranus (as well as a basic factor in Tzolkin, together with 13 presenting the number of Auric cycles in Table 10).
3. The year of 1987 being given in square brackets denotes the epoch of Returning of Quetzalcoatl (Kukulcan); this event is specially considered below.
4. By the evidence of Aristotle, Apuleius et al. [16] it follows that there were several prophets with the name Zoroaster. The age of the first of them is related to 6194 BC, whereas the last of them (about 600 BC) is considered to be a teacher of Pythagor.
5. The Earthquakes specified in this Table relate [17] to 21 of the most destructive ones. In aggregate, they are considered below.

Consider now the discovered trends and most actual events at great length.

12.3. The Synchronism Between the Geocosmic Phenomena and Auric Epochs of the Mayan Calendar

The synchronism between the Auric epochs of the Mayan Calendar and epochs of intense manifestations of factors of geophysical and cosmogeneous nature shows itself, first of all, on the scale of phenomena of global level (Table 10), which might be considered natural for the esoteric concept of Maya.

Millennial Geocosmic rhythms. The 12 –14 millennium rhythm is considered to be quite actual [18]. In particular, it is associated with the Deluge, which is considered to denote the transfer from the Wurm glacial era to warm Holocene. In compliance with geophysical data it might be supposed [18] that soon enough (about 2000 AD) this cycle may manifest its obstinacy once again: according to some estimates the nearest more or less intense and inauspicious influence the Space could exert on the Earth might take place about the year of 1999 (See also the note below as to July 1999). It is obvious that this rhythm is **completely synchronized** with the Auric extending of the Mayan Calendar to the epochs with numbers –2 and –1, viz. onto the epochs of the XII-th and VII-th millenniums BC, when, as in the epoch #0 (that is at the beginning of the MC), the **last three geomagnetic inversions** took place [8].

The influence the terrestrial magnetic field exerts onto the processes developing on the Earth is very significant. This field not only protects the biosphere by deflecting the very high energy particles to the Poles; almost all extremal atmospheric phenomena, as well as volcanic and seismic activity are synchronized with disturbances of the geomagnetic field. Therefore, variation of average geomagnetic field strength as a function of time presents an important factor for studying the synchronism. Within the scope of archeomagnetism, studying of this dependence is based on measuring of thermoremanent magnetization of the firing samples (e.g. burnt bricks, pottery).

Thus, the geophysicists E. Telie and S. Burlatskey [8] were studying those firing samples that had been dated by the archeological data. This allowed to reveal how the geomagnetic field strength depends on time for the last six millenniums. So, from

our days to the depth of time the geomagnetic field is smoothly growing up to about the beginning of the AD when it was approximately 1.5 times greater than now. After then, it decreases up to the IV-th millennium BC (viz. to the epoch of the beginning of the MC) when the geomagnetic field strength was two times less than now; by going even farther, the strength of this field starts to increase once again, though the obtained data are not sufficient for making an exact estimation.

Therefore, **the variations of the geomagnetic field are closely correlated with the Mayan Calendar** *the starting and termination of which are corresponded by minima* (viz. minimal protection of life), *whereas in the middle of this Calendar* (viz. around the epochs 550 BC and 56, 71 AD) *we observe the maximal strength of this protective geomagnetic field of our planet.*

Flashes of Supernovas, by exerting colossal influence onto the Space processes, are quite actual for this study, the more so that *all of them which has been registered in our Galaxy* **are synchronous with the Auric epochs of the Mayan Calendar** (See Table 10), viz. the separation epochs –2, –1, Z, 5, and 10. That is why consider their influence at greater length.

Outburst of Supernova generates enormous energy which exerts profound influence upon surrounding star systems; its luminous emittance becomes comparable with that of the entire galaxy in which this flash takes place. More than 300 explosions of Supernovas were photographically observed in other galaxies, but ***only three of them (in 1054 AD, 1572 AD, and 1604 AD,*** *See Table 10****) were registered in our Galaxy*** which in some cases were seen even by naked eye as objects being brighter than Venus.

The Supernova registered in 1054 by Chinese and Japanese astronomers was seen even in the day time. After then, at this place the Crab Nebula had developed. It was also followed by very long period of high Solar activity – up to the epoch of about 1300 AD (*viz. to the Auric epoch #4, 1287 AD*). At this, the content of radioactive isotope ^{14}C in the natural samples was at the highest level (about 10% above the norm) from 1100 AD to 1250 AD. Besides, this period was marked by the global rise in temperature, that was further called *the medieval climatic optimum.*

The last two flashes of Supernovas in 1572 and in 1604 (they were observed by Tycho Brahe and Kepler, and called by their names) were followed by a centennial decrease in Solar activity (so called Maunder's minimum); a small ice-age fell on the Earth. In Russia it was the Time of Trouble (up to 1605); apart from political confusion, for three years it was a period of extremely cold weather with Summer snowfalls, the "Great Pestilence" when the people ate the grass and bark. At this, the difference in global air temperature between the medieval climatic optimum and small ice-age period was about $1^{o}C$ only!

> ***"A seldom person had seriously responded to the Cosmic event that had occurred on the February 23rd, 1987 at 2:53 UT, whereas this event will probably go down to history" [19].***

At that moment, the Canadian astronomer Shelton who was working in Chili, had registered the flash of Supernova *in the Magellanic Clouds being the satellite of our Galaxy*. This Supernova was assigned the name **SN1987A**. Registration of the respective splash of gravitational radiation shows that its magnitude was extremely high. As a result, a vigorous energy flux had struck the Sun and planets, and it was powerful enough to influence even the Solar processes.

Thus, at the beginning of the 1987 the Sun was calm, whereas even in two days after this flash the sunspots had aroused on the surface of the Sun, and, since then, the number of sunspots had begun to steadily grow until the 11-year Solar activity maximum took place in 1989 – 1991, after the shortest inter-maxima period over the 150 years [19].

At this, a series of fierce natural cataclysms took place in that year: unprecedented drought and forest fires in USA and China in Summer and powerful floods in China in Autumn; the Nile had burst its banks and flooded Khartum. The Spring floods on the Rhine and Danube had exceeded all the levels on the record. The tropical thunderstorms and showers were continuing over the European part of the USSR for a month. In Autumn, ¾ of the Bangladesh territory was flooded, 30 millions of people were left homeless, the epidemic of cholera had flared up. The typhoon "Gilbert" did damage to the Caribbean Region for about $10 milliards. All these are apart from the unprecedented natural calamities in Nicaragua, Indonesia, and other regions [19].

Besides, the flash of Supernova stimulates, in particular, such processes as rising of the average atmospheric temperature which, in compliance with the World Meteorological Organization, could attain the values of 1.3°C in 2000 and 3°-4°C in 2050. To this end, the greenhouse effect and flash of Supernova act in unison.

The comet Hale-Bopp. The statistical analysis [12, 13] allows to consider this comet to be the next, after the flash of Supernova, link in the chain of cosmogeneous factors of influence that struck the Earth. Thus, the predicted [op. cit.] manifestations of its factors of influence, viz. unprecedented floods, conflagrations, clusters of air crashes, as well as political, economical and social cataclysms, were developing in 1997 in close synchronism with the time and geographical focuses of influence being basically specified by the comet's conjunctions with the Sun and eclipses, that is *by calendar dates*. Hence, it is not surprising, that with the high degree of confidence these dates were marked by the same (almost literally) manifestations in the next year (viz. 1998) as well. But what is more, *in 1998 these focuses were synchronous with the splashes of the Solar activity*; since this situation might be considered random, but with the vanishing probability of $\mathbf{10^{-12}}$, we come to the conclusion that

This time the Sun itself has turned its face to the Earth.

Last but not least, we may see that the development of the predicted [24] **battle between the Saturn and Uranus** seemingly comes to resonance with the comet Hale-Bopp's Focuses. Indeed, apart from the current orientation of the Solar System [11] which supports this thesis, the Saturn's ingress to Taurus (during its way to

squaring the Uranus) and high level of Solar activity have initiated these Focuses in March 1999 once again. In particular, one of them, **T5** (viz. **March 24**), was specified by the Moon eclipse conjunction with the comet Hale-Bopp's culmination at the Saturn's meridian and manifested itself (apart from other events [12, 13]) by riots in **Albania** (1997) and **Kosovo** (1998). This year, it was marked by the extraordinary **bombardment of Yugoslavia** (March 24, 1999).

If so, ***we may expect this July to surprise us with even more dramatic events***, as this month is marked by the well-known Nostradamus prediction, the comet Hale-Bopp's Time Focus T6 (July 4, 14), and Saturn/Uranus square (July 18). Besides, this situation is developing at a high level of Solar activity: during the January – April period of 1999, the Sunspot number took the values of up to **211** (!) and, in average, was relevant to those of Solar activity maxima.

Natural calamities. The amount of energy the Earth absorbs out of the energy flux engendered by a flash of Supernova is two – three times greater the energy emitted by the greatest earthquakes and is near to the power of tectonic processes in the Earth [19]. That is why the flash of Supernova SN1987A was able to change the seismic and tectonic course of events, viz. to initiate a number of drastic earthquakes, floods, and other calamities, as well as to shift their epicenters.

Indeed, with the end of eighties the scientists mention uncommonness of enormous earthquakes in Armenia, shift of Caucasus seismic region to North, activation (flowing of lava to the surface, increase in emittence of gases, rise in temperature of mineral sources) of **Elbrus** – the highest mountain in Europe and the volcano that was sleeping for five millenniums (*viz. since the beginning of the Mayan Calendar*), the crater of which is closed by a dangerous 8 kilometers^3 glacial plug. As well, these are mentioned the dangerous 6 points on Richter earthquakes in central Volga and other regions that were not related to such dangerous zones. A similar situation takes place in Ukraine (the last noticeable earthquake was in 1999) where the exploded nuclear reactor sarcophagus is disposed near the operating unit of the Chernobil atomic power plant (for this, see also the SULD effect, below).

12.4. The Synchronism Between the Most Destructive Earthquakes and the Auric Epochs of the Mayan Calendar

The seismic activity might be estimated by an energetic equivalent and by the number of victims. Since the sufficient world-wide statistics relevant to the former criterion does not exceed several decades, consider the latter one, the more so it reflects the influence the seismicity exerts onto the human beings in the most degree and is provided for a period of about 1200 years. Besides, it adequately reflects the total damage caused by all types of natural calamities, as in compliance with the data of American scientists [20] the victims caused by the earthquakes, at least for the period of 1947 to 1970, make about 16% of all those who had fallen a victim to natural

calamities (floods, eruptions of volcanoes, etc.) the historical data for which are also insufficient.

The earthquakes being referenced in Table 10 belong to those N=21 that caused the greatest number of victims (more than 50 000 each) in the world [17] since the year of 856 AD.

Table 11. The Most Destructive (Relative to Number of Victims) Earthquakes on Record in the World [17]

Year of the earthquake, Country	Nearest Auric epoch of the Mayan Calendar	Number of victims (in thou-sands)	Deviation Δ (in years) of the year of earthquake from the nearest epoch of the Mayan Calendar	
			Δ_{21} (by 21 quakes)	Δ_{17} (by 17 quakes)
1556, China	1574	830	18	18
1737, India	1752	300	15	15
1976, China	1971	255	5	5
1138, Syria	1287	230	149	-
1927, China	1929	200	2	2
856, Iran	823	200	33	33
1920, China	1929	200	9	9
893, Iran	823	150	70	-
1923, Japan	1929	143	6	6
1908, Italy	1929	70-100	21	21
1290, China	1287	100	3	3
1667, Caucasus	1752	80	85	-
1727, Iran	1752	77	25	25
1755, Portugal	1752	70	3	3
1932, China	1929	70	3	3
1970, Peru	1971	66	1	1
1268, Asia Minor	1287	60	19	19
1693, Italy	1752	60	59	-
1935, Pakistan	1929	30-60	6	6
1783, Italy	1752	50	31	31
1990, Iran	1997	50	7	7
In all – **21** quakes, **9** of them – **in XX-th** century	Average:		Δ_{21}=27.14	Δ_{17}=12.18

For the time interval of 1140 years, an analysis of synchronism between the 21 earthquakes presented in Table 11 and seven Auric epochs of the Mayan Calendar results in the following. It is only the earthquake of 1138 which deflects from the nearest Auric epoch at a significant value of 149 years, whereas the earthquakes of 893, 1667, and 1693 – at a meaningful intervals of 70, 85, and 59 years, respectively. In total, the average deviation (column 4) for all pairs yields the value $\Delta_{21}=27.14$

(years). Meanwhile, if we exclude the above mentioned four observation, for the remaining $n=17$ pairs (column 5) this average makes $\Delta_{17}=12.18$ (years). If we suggest the earthquakes to be not correlated with the Auric epochs, they are to be, in average, uniformly distributed over the observation interval $\Delta T=1998-856=1142$ (years); in this case the average deviation have to be equal to $\delta_{21}=74$ (years). The latter value three times exceeds the actual deviation $\Delta_{21} \approx 27$ (years). We will obtain even more striking result, should the above specified 17 earthquakes be considered: for the suggestion of absence of synchronism the average deflection makes $\delta_{17} = 70$ (years) against the actual average being equal to $\Delta_{17}=12$ (years).

This three- or five-fold decrease in deflection undoubtedly testifies to clustering of the most destructive earthquakes around the Auric epochs of the Mayan Calendar, that is around 7 dates over the period of 1142 years.

By considering the respective time intervals, estimate the probability P_{21} (P_{17}) of randomness of this clustering for $m=21$ ($m=17$) earthquakes:

$$P_{21}=[(2\cdot\Delta_{21})\cdot 7/\Delta T]^{21} = [(2\cdot 27.14)\cdot 7 / 1142]^{21} = 10^{-10},$$

$$P_{17}=[(2\cdot\Delta_{17})\cdot 7/\Delta T]^{17} = [(2\cdot 12.18)\cdot 7 / 1142]^{17} = 10^{-14}.$$

These vanishingly small probabilities practically exclude the suggestion of randomness of synchronism between the most destructive earthquakes in the world and the seven Auric epochs of the Mayan Calendar.

The same result yields considering of the world statistics [17] for the earthquakes with the number of victims exceeding 10 000 people that took place **in the XX-th century**. With respect to [11 – 13], ***these estimations allow to suppose an intensification of natural cataclysms in the forthcoming 12 – 20 years; at least, no evidence are present for them to decrease.***

Newly discovered sources of seismic danger. Instability of geophysical equilibrium is manifested not only on the level of explicit seismic or volcanic activity. The Earth's crust is not so stable as it was thought before. Apart from well known earthquakes (viz. high frequency oscillations that last seconds or minutes) and very slow epeirogeneous centurial movements, there were discovered in the eighties [18, 21] the vertical movements of the Earth's crust regions with the radii of tens to hundreds kilometers, which last from tens of minutes to several days. These movements were called the Short-lived Under-crust Local Disturbances (SULD). In most cases they are accompanied by meteorological anomalies, earthquakes and followed by natural and technological catastrophes. The amplitude of SULD varies from tens of millimeters to meters. On completion of a SULD, the soil comes to the same level so that repeated leveling does not show anything. The SULDs manifest themselves by

both vertical movements and horizontal waves; thus, on the ocean surface they form giant hills and hollows which are clearly seen from the spacecraft.

It is essential that the SULDs are not registered by conventional seismographs and may take place in the regions, which are not related to the seismic zones. Besides, use of heliometry (viz. study of release of helium from the Earth's crust) shows that a platform of the Earth's crust resembles not a solid shell, but rather a split block of ice which is "breathing". That is why 4 of the last 5 most powerful earthquakes took place [18] within the platforms. As well, heliometry acknowledges an old opinion of the geographers that the river may appear not everywhere, but always there where the tectonic allows. Therefore, the rivers flow along the fractures appropriate to their scale (e.g. the Moscow River flows along the crossing of two continental fractures).

However, the SULD is not taken account for while building the bridges, weirs, atomic power stations, trunk pipelines, etc. [18], though the analysis of a number of technogeneous catastrophes of eighties shows that their true cause was namely the SULD. In particular, with respect to the report (1999) of Russian seismologists, ***the low-level seismic activity should be considered the main cause of the Chernobil catastrophe in 1986.***

Therefore, *the recently discovered phenomenon of SULD*, the influence of which is growing [18], *is to be considered as outstanding, but hidden factor of danger* that may cause a series of technogeneous catastrophes, the more so they may take place in not-seismic regions, and this phenomenon is neither commonly acknowledged, nor studied.

Eclipses. Such a seldom phenomenon as total Solar eclipse at vernal equinox that will happen in 2015, had also taken place [8] in 3306 BC and 5966 BC when, as in the epoch of XIII-XI millennium BC, had occurred the last three inversions of the geomagnetic fields which were accompanied by the flashes of Supernovas. As well, the Auric epochs are closely correlated with both the termination of the last ice-age, and the epoch of increase of tectonic activity and fall-out of uranium.

Therefore, close synchronism between the Auric epochs of the Mayan Calendar and epochs of geological and Space phenomena, as well as actual development of Geocosmic trends allow to conclude that the termination of the Mayan Calendar, that is the period of 2013 ± 2, may really become the culmination of the series of natural cataclysms, which would signify the beginning of the New Age and might be likened to those ones that took place on the boundary of Paleolith and Mesolith.

12.5. The Synchronism Between the Epochs of Origination of the World Doctrines and Auric Epochs of the Mayan Calendar

With respect to extrapolation of the Mayan Calendar onto two Auric cycles in the depth of times, this Calendar covers (in a broad sense) the period of XII millennium BC to our days, which, for definitude, call *the basic period*.

In compliance with the existing archeological data, results of comparative studying of astronomical, ethnographical and other sources we may assume that before the basic period there were developed civilizations in South America (at least, for 70 millenniums as analysis of guano shows), in India (as the age of Rig-Veda is estimated [22] by several tens of millenniums), in Egypt. The remaining civilizations, as we may take it, originated in the basic period.

By having a least claim on compiling the model of the Universal history, pay attention to the epochs of originating of new knowledge and Teachings which have absolute world-wide importance for developing of the basic period civilizations. These are, first of all, the religious and/or philosophical systems and calendars integrating the time/space concepts, as well as the trends of their development.

To this end, it follows from the Table 10 that both for the ancient civilizations, and for those which originated in the basic period the close synchronism takes place between the Auric epochs of the Mayan Calendar from the one hand, and the epochs of origination of new civilizations and empires, coming of Great Teachers of humanity whose Doctrines had changed the world, as well as appearance of Great Books and calendar systems remaining alive until our days.

***** *On the personal level,* this relates, first of all, to **Krishna, Vyasa, Zoroaster, Gautama Buddha, Fu-Si, Lao-tzu, Confucius, Pythagoras, Platon, et alii**, until engendering of **Christianity** and disappearing of the people of **Maya**, with the exception of appearance of Islam and Moses as we are not provided with correct dating of his life.

***** *On the level of calendars*, this relates practically to all civilizations, viz. **China, India, Iran, Babylon, Egypt, Maya**, etc.

Therefore, by structuring the Mayan Calendar the Auric Time Scale specifies several epochs, which are common for evolutional rhythms for the basic world religious and/or philosophical systems, regardless of time they have originated. In some way ***this gives one more evidence for the Theosophical concept stating [9] the singular esoteric root of all these systems***.

But what stands behind this puzzling synchronism, and why that almost unknown Mayan culture was chosen for specifying the mystery of Time? These questions become even more mysterious due to the below considerations.

The Mayan civilization is the unique system of knowledge that integrates the concepts of both linear and exponential Time [1]. It is almost unknown to the modern civilization, as after the Spanish “censorship” has reduced its written heritage to three or four manuscripts, there remain only the chronicles which are engraved in the stone. That civilization is not appraised now very high as it did not know neither a wheel, nor an iron. However, the Maya had developed the Calendar the mathematical and esoteric depths of which were not completely revealed until now (for instance, the

modern astronomy adopted, in fact, the Mayan idea to count days in the Julian Day count). And now, we have sufficient evidence for the Mayan concept stating that the history is the exponential process which in some way is determined by exchange of information [1] (viz. origination and propagation of new knowledge); mathematically speaking, we may express this idea as follows

(the amount of new knowledge) × (time of obtaining this knowledge) = constant.

Through the evolutional cycles of decreasing duration, this paradoxical formula naturally leads us to some point of bifurcation (or transformation) where the humanity becomes unable to further withstand the acceleration any more.

This esoteric Doctrine of Maya presuming existence of hyper-cycles in development of the Earth's humanity, in general, expresses the same idea the Secret Doctrine specifies, that the Galactic Center (Chunab-ku, relating to Maya) presents the Supreme Wisdom and Hierarchical and Hieratic Governor which exerts the cyclic influence to its subject, the Solar System.

> ***This way, we may consider the Mayan Calendar as a structure that in a definite sense describes the historical hyper-cycle we are living in, whereas the end of this Calendar denotes the termination of this hyper-cycle when the Earth will pass the Ray of Galactic Synchronization which would cause the Evolutional Rise and Advance in Consciousness. And what is more, this concept to the full extent corresponds to the current orientation of the Solar System to the Galactic Center [11].***

However, as these are cycles within the hyper-cycle, which converge to the end of the Mayan Calendar, they do not develop instantly, but in the Auric progression. In this sense, ***the flash of Supernova SN1987A in 1987 is naturally to be considered as the fulfillment of the personified Mayan prediction on returning of Quetzalcoatl (Kukulcan) in 1987 in the form of action of Cosmogeneous factor of influence, which overshadows the humanity on the threshold of the Galactic Ray*** (there exist the grounds [11] to suppose the Synchronization itself to be caused by one more Supernova).

Indeed, the correspondence between the ***personal*** and ***impersonal*** factors is explicitly discussed **in Theosophy** [23], "… in the Lamaist Hierarchy there are five living, or incarnated, Buddhas as well, and the Principal of them is the Dalay Lama. Above him is only the "Supreme Wisdom" – the abstract principle emanating five Buddhas, including Buddha Maitreya – the tenth Envoy being expected on the Earth (who is the last [in the respective cycle] Buddhisattva or Vishnu in the image of Kalki Avatar). However, this will be the same United Wisdom and it will incarnate into the humanity as a whole, but not in a separately chosen personality. But do not a word about this secret for the present."

Seemingly the same situation takes place [16] with the **historical Joshua** (the son of woman Stada nicknamed Miriam and Roman soldier Panthera), Initiate and Great Adept, who was living from 120 BC to 70 BC, **Evangelic Jesus** (Irineus states that he was preaching at the age of 40 to 50), and dissemination of **Christianity** in the middle of the 1st century (See Table 10), the true founder of which was **Paul**, who was the reformer of the organization that obtained the name "Christianity" three centuries later, under the Emperor Constantine.

Conclusions

By having no possibility for going into detail on social, economical and other manifestations of the ATS-epochs, which undoubtedly present actuality for system analysis of the developing situation, formulate the conclusions that result from the revealed synchronism between the internal trends of the considered phenomena in Nature and society and the ATS-epochs.

1. In the long run, this is Table 10 that concentrates the basic results of this work.

In the narrow sense, it presents ***twelve basic Auric epochs*** which divide the term of the Mayan Calendar onto cycles with periods decreasing in the Golden section. By continuing these cycles into the depth of times, viz. beyond the year of the 3113 BC, we obtain ***two more separation epochs, 6296 BC and 11446 BC,*** which correspond (as approximations) to ruin of the last hearth of Atlantis (by Platon) and completion of the last Ice-age, and, together with the epoch of the beginning of the Mayan Calendar, these three are synchronous with the last three geomagnetic inversions, apart from other actual events. This means, that completion of the MC in 2013 AD signifies termination of 12 (or 13) evolutional cycles since the ruin of Atlantis (completion of the last Ice-age) that cover, in total, the period of 8.3 (13.5) millenniums which is (are) mentioned in bibliography and include more or less described history of this civilization.

In the broad sense, in common with other actual epochs (e.g. 550 BC) the event-versus-epoch data of Table 10 corroborates the effectualness of the Auric Time/Period Scale with respect to "historical" or evolutional Time as well. In other words, if it was established in [6] that the Auric (Time/)Period Scale presents the united system of periods (that is synchronism) both to the most cycles in Nature and society, and to the Solar-planetary ones, the results presented in this work allow to conclude that it is also adequate for describing the evolutional (or "exponential", in the sense of accelerating of the course of events) Time within some megacycles that cover millenniums.

This way, the ATS might be likened to the ***Auric Spiral of Time***, the turns of which are better described by the Aurically structured trends, whereas at each turn the phenomena are more adequately taken via the harmonic cycles of equal duration, unless this spiral approaches the point of bifurcation.

2. It is established that the ***Golden section*** and Fibonacci numbers in the form of the ***ATS*** and series ***u, v*** are essentially ***incorporated in*** both count of days and internal structure of the ***Mayan Calendar***; this allows to state that this calendar reflects the Solar-planetary synchronism to the much more extent than it was supposed by taking account of its harmonical periods (Tzolkin, cycles of Venus, etc.) and evolutionary 2^k-cycles.

Besides, if we take the accepted dating (August 6 – 13, 3113 BC) for the first day of the Mayan Calendar, the last day of this Calendar hits the end of November of AD 2013. More precisely, *the last day of Mayan Calendar comes to November 19, 2013 AD*, should the Golden-section-date of August 6, 3113 BC be accepted as the first Gregorian date for the first day of the Mayan Calendar.

3. A *striking synchronism* between (1) the evolutional trends in *growth of population of China* (over the period of two millenniums) being considered as an indicator of world exponential trends, (2) internal *Auric structure of the Mayan Calendar* covering the period of five millenniums, and (3) *global events and trends in Nature and consciousness of the known civilizations* (from geomagnetic inversions, earthquakes, and Supernova flashes to coming of Greatest Teachers of humanity and miraculous disappearing of the Mayans in 830 AD which also stretch for several millenniums) testifies to the truthfulness of the Hypothesis on the Auric Time/Period Scale.

As a consequence, we obtain the *bifurcation period being determined by the specified bifurcation points* T_i^* (See 4, below) that is arranged long before the period of possible cataclysms of 2035 – 2050 predicted by some researches. And what is more, the modern civilization has even entered this period in T_1^* and is impetuously approaching most dramatic events that would probably concentrate around the subsequent points of bifurcation, which we may expect to be the more intense the closer we come to the point T_5^*.

4. The obtained qualitative conclusions and relevant quantitative estimates allow to consider *the Age we came* to as the immediate threshold of transformation of the Earthy civilization (that was predicted by the Mayans long ago), or *the period of bifurcation* with the following key points:

T_1^* 1991 ± 2 "Patent" bifurcation point being associated with the Solar activity maximum (1989 – 1991) and completion of the 6th (Table 7) and 7th (Table 8) evolutional demographic cycles. It was reflected in the ruin of the USSR and coming of new world misbalance.

T_2^* 1996 ± 2 "Implicit" bifurcation point being associated with starting of critical doubling of population and respective final evolutional cycle (1997 – 2013) of the Mayan Calendar, as well as with powerful manifestations of cosmogeneous

influence (Galactic Center [11], comets Hyakutake and Hale-Bopp [12] whose action was closely synchronized with the growth of the Solar activity [13]), the latter seemingly specifying both factors of influence, and geographical and time focuses for the development of the forthcoming trends.

T_3 2003 ± 2 "Patent" bifurcation point being associated with the joint influence the forecasted [7] Solar activity maximum, coming into the Age of Capricorn [11], and Uranus could exert onto the worldwide processes.

T_4^* 2008 ± 2 "Implicit" bifurcation point being associated with starting of the last evolutional demographic cycle before the termination of the Mayan Calendar.

T_5^* 2014 ± 2 "Patent" bifurcation point being associated with termination of the Mayan Calendar and starting of critical succession of cycles of doubling of population, as well as with the forecasted Solar activity maximum and possible geomagnetic inversion.

5. The aforesaid allows to draw the general conclusion that the large-scale worldwide catastrophes associated with natural cataclysms and mass scale decrease in population, apart from other phenomena, are most likely to be expected long before the year of 2035 (by L. Pritsker) or 2030 – 2050 (by J. Forester); namely, we may suggest them to be developing until 2013 – 2015, but in several stages with epicenters specified by the above mentioned bifurcation points that has already started to manifest themselves.

The basic idea of this work is neither to frighten the reader, nor to establish the date of the Apocalypses, but to emphasize the reality of Theosophical and Mayan concept implying for the humanity the necessity and possibility to correct its way on passing the period of bifurcation by urgently harmonizing the relations within itself and with the Nature. And so, the authors hope this work to be helpful in a way a diagnostics must precede an operation.

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NOTE: An asterisk denotes publications being available in Russian only.

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