Astrophysical Clock and Manned Mission to Mars

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For many years scientists of different countries are engaged in research of biological processes, which have rhythms close to geophysical ones. The main objective of this research was finding the mechanism of time sensor, which leads to these rhythms. In the previous article (Akhmedov T.R. *Progress in Phys.*, 2014, v. 10, issue 1), based on the analysis of the known experimental data obtained from biological objects and in consideration of the original data obtained in Tashkent State University, we came to a conclusion that the time sensor of a biological clock is exogenous in nature. This means that clocks setting rhythms close to geophysical for biological processes exist outside of those biological objects. From this we conclude that there are no biological clocks, but rather there are astrophysical clocks (APhC), which form rhythms with periods close to geophysical within physical, chemical and biological processes.

1 Astrophysical Clocks (APhC)

Let us review the experimental data proving the existence of Astrophysical Clock. For this experiment we put assembled a system, schematics of which is plotted on Fig. 1.

Container (1) with distilled water was placed into the thermostated chamber (2), where stable temperature at $103 \pm 0.1°C$ was maintained. Water was boiling inside the container (1). The water vapor went through the cooling system (3) and precipitated into the container (4). The mass of the evaporated/precipitated water was measured every 15 min and a set of 4 measurements had been plotted on the Fig. 2 and Fig. 3. The experiments were carried out uninterruptedly by a number of series of 1 to 7 days of duration. In order to thoroughly investigate the rate of water vaporization power supply of the thermostat was carefully stabilized, all containers and tubes and connections were thermally insulated, mass was carefully measured and stability of the temperature was closely monitored. The data coming from the measurements strongly suggested the existence of CR in the physical process of distilled water evaporation from a thermostated container.

Initial experiments were carried out in 1974. During one of experiments it became necessary to obtain a stable flow of water vapor of low intensity (1.4×10^{-5} kg/s). This experimental data had been obtained in 1974 by a group of physicists conducted by Prof. M. A. Asimov. Author of the present article was a responsible head for the experiments.

2 Lunar rhythms

This study rises from my previous article [1], based on the analysis of the known experimental data obtained from biological objects and in consideration of the original data obtained in Tashkent State University. We came to a conclusion therein that the time sensor of a biological clock is exogenous in nature.

Scientific publications, dedicated to research of biological rhythms with periods close to geophysical ones, present much experimental data pointing at the existence of lunar
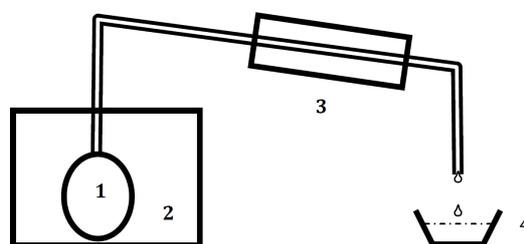

Fig. 1: (1) Container filled with distilled water; (2) Thermostated chamber with inside temperature of $103 \pm 0.1°C$; (3) Cooling system; (4) Container where the water condensate was collected.

rhythms in biological processes [2, 3]. In 1974, a research group conducted by M. A. Azimov in Tashkent State University (Uzbekistan) identified lunar rhythms in chemical reaction of vapor conversion of methane at $T = 450°C$. It is obvious that at such temperatures we can effectively exclude biological processes.

The stable vapor flow of low intensity was necessary for studying of chemical reaction of vapor conversion of methane. The reaction used in chemical industry to produce hydrogen is described by a formula:

$$CH_4 + 2H_2O \longrightarrow 450°C \longrightarrow CO_2 + 4H_2 .$$

To investigate time dependence of the reaction speed there were provided stable flows of gaseous CH_4 and water vapor (deviations were $\pm 0.3\%$ and $\pm 3\%$, respectively). The experiment had been carried out for 540 hours in October and November of 1974.

In Fig. 3 the experimental measurements were plotted, y axis shows the fraction of residual methane in the converted dry gas at the output of the reactor.

Composition of the gas at the output was analyzed by the method of gas chromatography. Every 15 min three chromatographs were collected; results of 2-4 hour measurements were averaged and then plotted on the Fig. 3. Results of
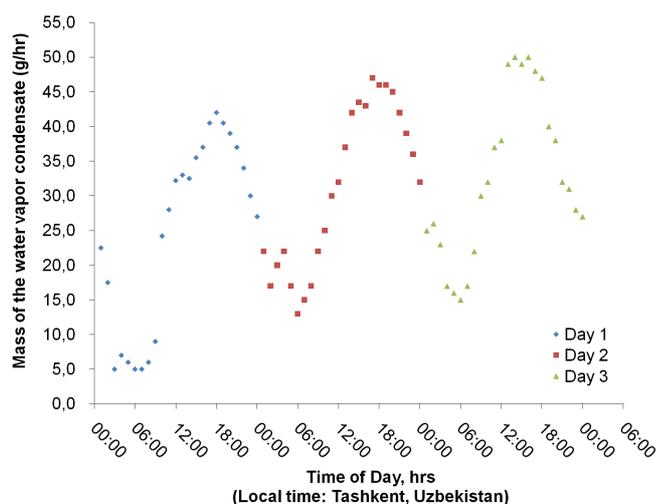
Fig. 2: Circadian periodicity of evaporation of water from a thermostated vessel at 103° (1974).

Fig. 3: Concentration of residual CH_4 in % in vapor conversion reaction output.[†]

these studies indicated on the existence of a lunar rhythm in the chemical reaction of vapor conversion of methane at $T = 450°C$. This temperature is noticeably higher than temperature of any known living organism.

3 Shnoll effect

One more argument in favor of existence of astrophysical clocks (APhC) is Shnoll Effect. It is shown that due to fluctuations, a sequence of discrete values is generated by successive measurement events whatever the type of the process measured. The corresponding histograms have much the same shape at any given time and for processes of a different nature and are very likely to change shape simultaneously for various processes and in widely distant laboratories. For a series of successive histograms, any given one is similar to its nearest neighbors and occurs repeatedly with a period of 24 hours, 27 days, and about 365 days, thus implying that the phenomenon has a very profound cosmophysical (or cosmogenic) origin [4, 5].

Substantial experimental material accumulated by biologists studying rhythms close to geophysical constitutes observations of the hands of astrophysical clock, which sets rhythms for biological processes. The rhythms for these processes are set by external forces.

Thus, from above described experimental data we conclude that rhythms close to geophysical, which occur in physical, chemical and biological processes, exist because of Astrophysical Clock (APhC).

4 How does Astrophysical Clock (APhC) work?

Let's analyze changing of kinetic and potential energy of atoms/molecule on the surface of the Earth. An atom/molecule on the surface of the Earth takes part in following motions:
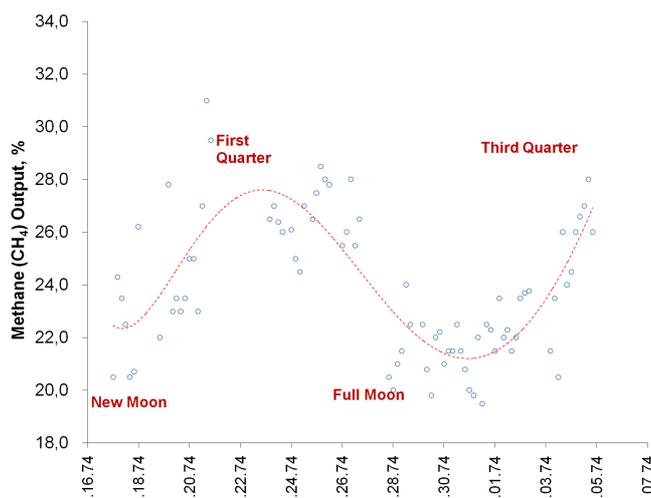
1. Spinning of the Earth around its own axis with the surface speed $V_1 = 465 \cos \alpha$ m/s, where α is the geographic latitude;

2. Revolving with the Earth around the Sun with a linear speed of $V_2 = 3 \times 10^4$ m/s;

3. Moving with the Solar system around the center of the Galaxy with a linear speed of about $V_3 = 2.5 \times 10^5$ m/s;

4. Moving with the Galaxy from the center of the Universe with a linear speed of about $V_4 = 6 \times 10^5$ m/s.

It's known that total mechanical energy is the sum of kinetic energy E_K and potential energy U:

$$E_{\text{total}} = E_K + U (2).$$

And, if any of these components or both of them change according to a law, then the total energy will change according to the same law. And the change can be potentially affecting any physical, chemical or biological process. The factors 1-3 cause changing of kinetic energy of atoms/molecules on the surface of the Earth with periods, respectively, 24 hours (CR), a year (year rhythm), 180 million years (the Galaxy "year" rhythm). The existence of the rhythms has been mentioned above. Analysis of the kinetic energy changing leads us to the following formula:

$$E_{\max} - E_{\min} = 2m \times V_T \times V_E \cos \alpha,$$

where m is mass of an atom/molecule, V_T is thermodynamic speed of an atom/molecule, V_E is the orbital speed of the Earth's surface on the equator, α is the geographic latitude.

5 Conclusion

1. Experimental data on research of rhythmic processes with the periods close to geophysical (circadian rhythm — CR, lunar rhythm — LR, annual/year rhythm — YR) testify to existence of Astrophysical hours (APhC).

2. Rhythms with the periods close to the geophysical are experimentally observed in physical, chemical, and in biological processes. Furthermore, the circadian rhythm (CR) both in physical and in biological processes demonstrated a connection to local time.

3. Periods close to geophysical in all processes are formed Astrophysical Clock by change of a total energy (kinetic and potential) of atoms/ molecules located on the surface of Earth and moving with it in a space.

4. The Lunar Rhythm (LR) observed in chemical and biological processes is a result of a change of potential energy of atom (molecule), located on the surface of Earth. This change in potential energy is caused by movement of the Moon within the system Sun – Earth – Moon. All planets of the Solar System can have similar impact on processes taking place on Earth.

5. Biological objects (including humans) constantly have to receive signals of astrophysical clocks (APhC) for normal functioning. Thanks to APhC biological objects (almost closed systems) have an opportunity to exchange energy with environment, while maintaining their integrity.

6. During a long flight on low Earth orbit the time sensor of circadian rhythms is distorted for astronauts. This distortion could lead to imbalance of biochemical processes in astronaut's body, which could result in serious health issues. These issues may not manifest immediately.

7. During flight to Mars, human body stops receiving signals for setting circadian, lunar and yearly rhythms. This leads to total unbalancing of finely tuned biochemical reactions inside the body. At this point nobody knows what consequences this unbalancing may lead to. The difficulty of this problem is that experiments like Mars-500 cannot provide answers to these questions. One cannot turn off astrophysical clock during experiments on Earth.

8. To all those who desire and are able to carry out experiments studying the time dependence of water evaporation within a thermostatic vessel, further I provided the technical specifications:

- Thermostatic vessel to contain the liquid (8–10 litres of volume);

- Thermostatic liquid — motor or vegetable oil with temperature of 103±0.1°C;

- A system to distilled water, using typical chemical lab hardware;

- The flask with water to be evaporated should be located inside the thermostatic vessel;

- Cooling system for water vapor condensation;

- Water passing through the cooling system should be room temperature of 20°C with flow rate at 1 litre per minute;

- The frequency of measurements (time interval at which measurements are taken) is at the discretion of scientists setting up experiments (10 min, 15 min, etc.).

Objective: to plot the correlation of water vapor (condensate) with the time of day. Running experiment for 72 hrs is preferred. When publishing results of this experiment, the researcher needs to state geographical coordinates where experiment took place.

References

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