TELEKINESIS AT THE QUANTUM LEVEL
Analytical review of some Russian studies

L. Boldyreva, N. Sotina

Introduction

This article is a review and analysis of several experiments conducted in Russia during 1980-90s on living organisms' distant influence on other living organisms and physical devices (primarily noise generators). Experiments were performed by or under supervision of qualified and unbiased scientists known to authors, however, in most cases those were exploratory studies usually terminated by lack of funding and in some cases unpublished.

Selected experiments have one common feature: their results are unexplainable by acoustic, electromagnetic or other known processes because effects observed in these experiments could not be shielded by electromagnetic screening, practically did not depend on distance, and, in cases with human operators, occurred only when intentional bonds were established between the operator and the subject.

Analysis of these results led us to conclude that the influence of living organisms on devices occurs at a quantum level, i.e. human operators or living organism seem to act on elementary particles of the objects and their spins at a distance. We believe that to explain the nature of that influence one needs to look deep into the matter itself and study the properties of the physical vacuum, still not quite understood by modern science.

Human operator's influence on magnetometers

Experiments were conducted in 1978 jointly by the St. Petersburg State Institute of Precise Mechanics and Optics (now Technical University) and the Institute of Terrestrial Magnetism (IZMIRAN) under supervision of Professor G. N. Dulnev.[1] Studied was the effect of N. S. Kulagina, the widely known operator (sensitive) with outstanding extrasensory and telekinetic abilities, on magnetometers of various types.

The operator's effect on instrument readings appeared to be dependent on the design and the principle of operation of the instrument. N.S. Kulagina did not generate either pulse or stationary magnetic field beyond the normal range when she tried to influence the induction copper-wire coil connected to an oscilloscope and/or a portable proton magnetometer (based on the induction coil as well).

Striking results emerged in experiments with a germanium Hall probe when she passed hands over the sensor or acted at a distance, or held the sensor in her palms. The recorded magnetic induction was 10^6-10^7 nT, which exceeded the norm by approximately 10^5. The operator maintained the signal for 3-4 seconds. Fig. 1 shows the results of Kulagina's influence on the Hall probe (the dashed and solid lines refer to two typical results in a series of experiments).

Researchers concluded that first, the operator's effect on the instruments was not of a magnetic nature and, secondly, it occurred at the quantum level. Indeed, the Hall probe is a device in which the external magnetic field creates a Lorentz force acting on electrons. Since it was established that Kulagina did not generate any magnetic field, the effect produced by her on the Hall probe could be explained only by direct action on electrons, the quantum objects.

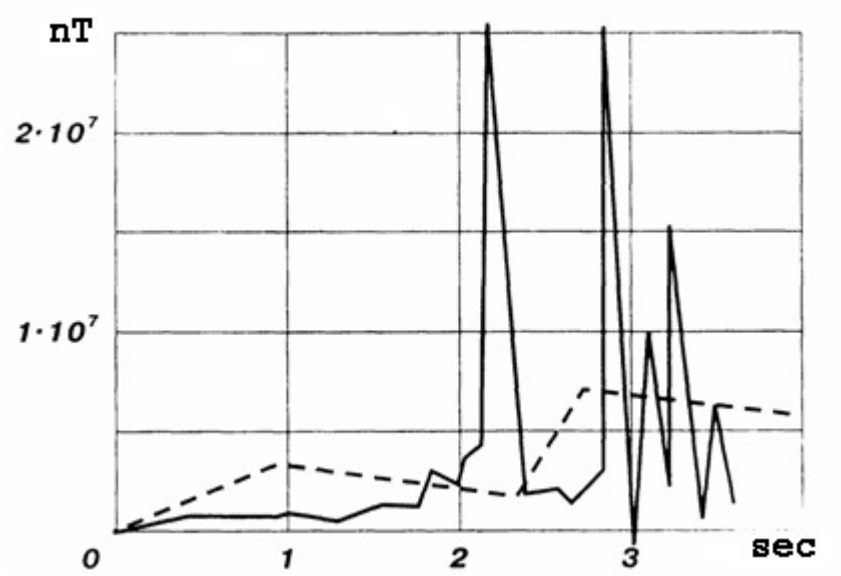

Fig.1. Output signals of the Hall probe influenced by N.S. Kulagina at a distance as a function of time.

Human operators' influence on a flicker noise generator

Experiments were carried out by G. K. Gurtovoy and A. G. Parkhomov in 1984-1985 at the laboratory of Bioenergetics of the All-Union Council of Scientific and Technical Societies.[2] Noise generators – transistors, microchips, photo-resistors (on the basis of CdS or CdSe) and thermoresistors (of Cupper-Manganese oxide ceramics) -- were made using both bipolar and metal-oxide-semiconductor technologies. These semiconductor devices were screened from the ambient electromagnetic interference.

The effects of the operator's influence became apparent only with suppression of the high frequency noise down to 0.1 *Hz*, that is, in the frequency band of flicker noise. (Fluctuations prevailing in electronic devices at low and infra-low frequencies are called "flicker noise," or 1/f noise, in contrast to the "white noise" prevailing at high frequencies.)

The noise generators were placed in a small room with walls covered with iron sheets painted black; recorders were placed in an adjacent room. More than 20 operators participated in the experiments including such celebrities as V. Avdeev, K. Nikolaev, A. Chumak and E. Dubitsky.

Operator's intent resulted in a change of amplitude and other parameters of infra-low frequency fluctuations recorded. In some cases, the influence of an operator produces a considerable (by a factor of tens!) increase or a decrease of the fluctuations amplitude and the bursts occurred not only during the action but 5–10 minutes after the apparent end of the action. Frequently, another amazing effect took place: oscillations with the period from some seconds to some hundreds seconds appeared in the background of a noise-like signal (Figure 2).

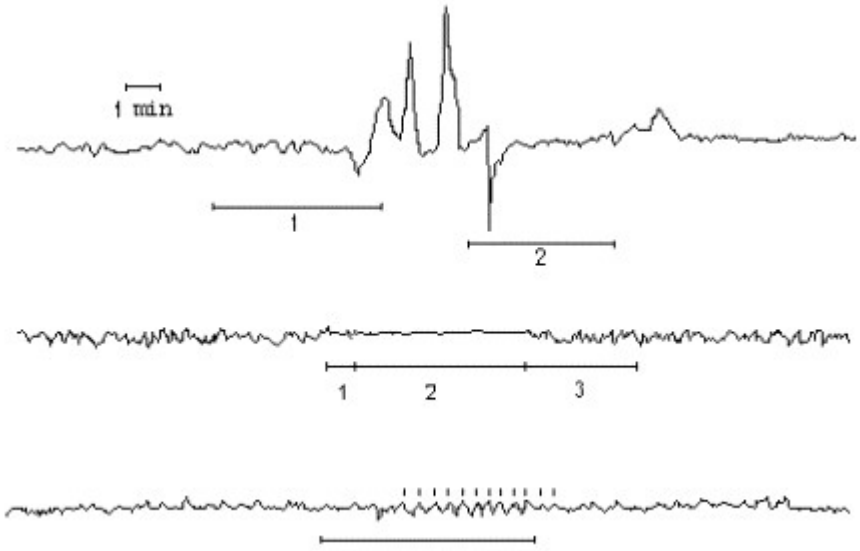

***Fig. 2*. Human operator's effects on the flicker noise generator (chip 1LB201).**
Top: Increase in the amplitude of voltage fluctuations (operator Drozdova, December 1984).
1 -- establishing contact with the detector, feeling of "cold"; 2 — "hot" during inhalation, "cold" during exhalation.
Middle: Decrease in the noise amplitude (operator Avdeyev, May 1986). 1 — establishing the contact with the detector; 2 — entering the state of "complete rest"; 3 — entering the state of "high excitation".
Bottom: Example of the record of a signal containing a long wave train of quasi-periodic pulses (operator Davydov, February 1985).

Based on a large number of experiments (more than 100), the following effects of operators "influencing" were revealed:
- considerable growth (by factor of tens!) of the noise amplitude during the "influence" by sensitives (the upper curve);
- decrease of the noise amplitude (the middle curve);
- ordering effect: occurrence of periodic oscillations with the period from several seconds to several hundred seconds in the background of random noise signal and the subsequent "dissolving" of the oscillations in the noise signal (the lower curve);
- production of oscillations with gradually decreasing period from several tens of seconds down to several seconds;
- considerable bursts of the noise signal 5 to 15 minutes after the end of the apparent "influence".

During the experiments, as a rule, 2 or 3 noise generators were operating simultaneously; there was no definite correlation of the effects associated with influencing them.

In order to come to any conclusions concerning the nature of the operator's influence in the above experiments, let us discuss in detail the instruments influenced upon. As was mentioned above, those were devices, where semiconductors were used in a semi-crystalline state (photo-resistors, photo-electronic multipliers), and also transistors and chips made by "metal-oxide-semiconductor" technology. It is known that devices of that type generate a strong flicker noise. We should also remind that operators' effects became apparent only in the frequency band of flicker noise. According to the experimenters, [3] $1/f$ noise arises due to interaction of current carriers with massless infraquanta: photons, electron-hole pair excitations at metallic Fermi surfaces, generalized spin waves, transverse phonons and hydrodynamic excitations of other quanta. Quantum $1/f$ noise constitutes an essential part of $1/f$ noise. In the small semiconductor devices, quantum $1/f$ noise is caused by the conventional electrodynamical quantum $1/f$ effect. The latter has the following physical origin: some of the current carriers have lost energy in the scattering process due to the emission of bremsstrahlung. Therefore part of the outgoing DeBroglie waves are shifted to slightly lower frequencies. (The scattered carriers reaching a detector at a given angle away from the direction of the incident beam are described by DeBroglie waves of a frequency corresponding to

their energy). These current fluctuations present in the scattered beam will be noticed at the detector as low frequency current fluctuations. The quantum 1/*f* effect is a many-body or collective effect best described through the wave function and correlation function**.**

Thus we can conclude that the operator's influence on the noise generator in the frequency range of flicker noise might have occurred at the quantum level.

Human operators' effect on microcalorimeters

For a few years starting in1982 G.K.Gurtovoy and A.G. Parkhomov conducted a study on sensitive's action-at-a-distance on a shilding microcalorimeter (SMC).[2] SMC is an electronic device designed at the Moscow Engineering Physics Institute by Dr Parkhomov's R&D team.

The device is calibrated in such a way that any heat release by the object under test inside the SMC is measured as a change in the object's temperature. The microcalorimeter in which melting ice is used for thermal stabilization is an instrument measuring weak thermal effects where temperature is measured as thermistor's electrical resistance. It can measure temperature difference of the order of 10^{-5}K. When radiation is absorbed the heat is released inside the object under test and the resistance of the thermistor changes. This is the principle of the application of calorimeters for precise measurements of the intensity of various types of radiation: **γ**-radiation, neutrons,... "Turning on" the radiation causes a very simple signal: a smooth increase for about a minute to a level proportional to the power of heat emission. After radiation is "turned off" the signal returns to the initial level as smoothly as it increases. For all known types of radiation only increase of the temperature is observed.

The microcalorimeter used in the experiment was shielded from electromagnetic and other known types of radiation. In the experiments the thermistor itself was used as the object under test. The thermistor used in the experiment was a semiconductor (of cupper-manganese oxide ceramics). The 'regular' thermal influence – turning on the thermal heater built-in into the calorimeter – caused the appearance of quite a normal response with a slowly increasing signal. At the same time, the signal under psychic influence sometimes corresponded to the decrease, not increase in the temperature relative to the initial level. The signal change was not smooth, but abrupt. After the influence stopped it didn't return to the initial level but got 'struck' on a new level or jumped from one level to another and those levels had well defined values. Changes of the signal under psychic influence corresponded to the thermal emission of the heater in the order of (1-9)•10^{-6} W. Fig. 3 shows one of the results of the operator influence.

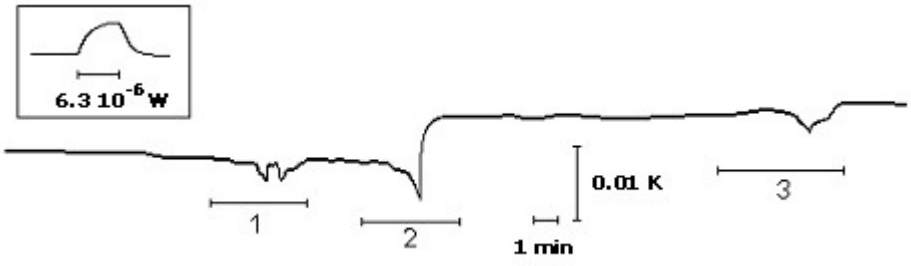

***Fig.*3 Results of the influence by A.V. Chumak on a shielded micro-calorimeter.**
Horizontal lines mark the time of the influence: 1 — establishing "contact" with SMC, 2 — the sensitive mentally increases the temperature of the detector at a distance of 0.5 m, 3 — the sensitive mentally decreases the temperature of the detector being in an adjacent room 3 m away. Top left insertion — the result of turning on and off the electric heater. March 1986.

Results of a great number of trials reveal the following characteristics of the operator's action-at-a-distance.

1. The human operator could produce not only an increase but also a decrease of temperature (note that

any change in thermistor's resistance is recorded as variations of temperature). The absorption of "conventional" types of radiation, such as electromagnetic radiation, could only lead to the increase in its temperature.
2. After the very first operator's "action" stopped, the signal did not return to the initial level for a long time. The subsequent operator's "actions" resulted in a signal change; however, when he discontinued, the signal returned to a level close to that established after the first "action". Note that upon turning off the electric heating the signal always returns to the initial level.
3. The unusual character of the signal at the operator's "action" is noteworthy. Turning on and off of the electric heater causes a relatively smooth temperature change while the operator's "action" produces a relatively sharp signal change.
4. Screening of the microcalorimeter from electromagnetic and other type of radiation did not affect the result produced by the operator, and in some cases made it even more "distinct
5. The effect of the operator "action" did not practically depend on the distance between the operator and the microcalorimeter. The latter varied from 0.5m to 2000 km.
6. The "selectivity" of the influence object was apparent. For example, Dubitsky acted successfully on a device placed in the adjacent room while a reference device of the same type in the Dubitsky room, of which he was unaware, did not respond to his influence.

The form of the output signal showed that the registered variations were not only due to changes in temperature of the thermistor. Indeed, the sharp changes in temperature may occur only as a result of a strong sudden emission of heat and in order to keep the temperature on a certain level the long-term emission of heat is required. It is hard to imagine a thermal process that is able to follow this scenario.
It must be mentioned that manifestations, such as a drop of temperature, a high rate of material properties variation or an appearance of hysteresis are characteristic of a phase transitions accompanied by the change of spin orientations. It is true, for example, for magnetite (a Fe_3O_4 composition manufactured using a special technology) within the temperature range of 122-128 K, i.e. during the spin directional transition.[4] All that is similar to the mentioned above features of the sensitive's effect on instruments: it can be assumed that affected are spins of particles of which the object consists.

Crawfish's influence and plant's influence on the noise generator

Experiments were performed by Y.A. Popov at the Moscow Physical Engineering Institute in 1995.[5]
Small size heatproof film resistors (graphite on ceramics) were used in the noise generator. The generator was screened from electromagnetic interference. The quality of the screening was very high: a 1 *kW*, 50 *Hz* transformer placed close to the experimental setting did not produce any additional signal of the same frequency in the output.

I. The measurement setup and the organisms (crawfish) were placed in different rooms separated by a massive brick wall at a 3 *m* distance from each other. The influence of the crawfish on the noise generator at the moment of their death (in boiling water) was studied. Results of the experiments are given in Figure 4.

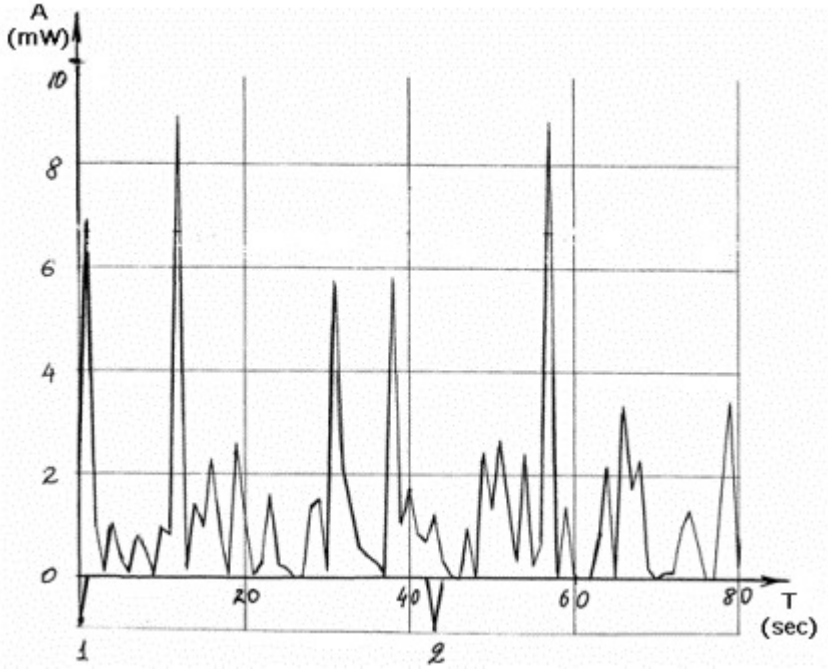

Fig. 4. **The amplitude (A) of the electric signals at the generator output.**
T is the time elapsed since the start of the experiment. Below are shown the times when the crawfish was dropped in boiling water.

As can be seen from Fig. 4, pronounced peaks in the amplitude were observed at the generator output 10-15 sec after the crawfish had been put into boiling water.

II. The measuring device and the plant (Pelargonium peltatum) were placed 1.5 m apart in the same room. People were not present in the room during the experiment. The plant was placed in an opaque box. Periodically, with certain time intervals, one of the walls had been opened for a few minutes exposing the plant to light. The 'learning' process continued for 6 hours. Then the light was no longer supplied, but at the moments of time when the light supposed to appear, the measuring device was registering the signal. It looked as if the plant developed a 'conditional reflex' and was "asking" for light. The results of the experiment are shown in Fig. 5.

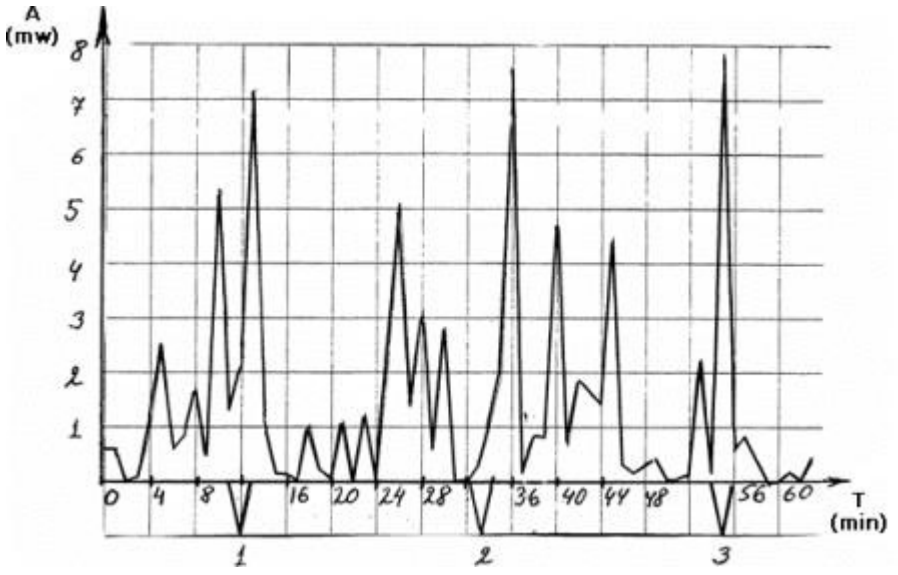

Fig. 5. **The amplitude A of the electric signals in the output of the noise generator versus time T.** Moments of

time when the light was supposed to appear are shown below the T axis.

We do not describe here other abilities of plants to "learn" or "tune" their functions in time that were observed in the experiments, besides the ability to affect the noise generator. According to [3], the high $1/f$ noise in thin film based devices and/or devices using heavily doped semiconductors, such as those used in the experiments, is a rather common effect. This allows us to conclude that the influence of both crawfish and plants on the devices occurs on the quantum level.

The analysis of the above experiments allows one to conclude that living organisms including humans can affect measuring devices, and this interaction

1) cannot be shielded with electromagnetic screens,

2) does not practically depend on a distance (which varied from 0.5 km to 2000 km in the experiments);

3) is "selective" (the reference instruments located in close proximity to the instrument being acted upon do not respond to the operator's action);

4) takes place at the quantum level.

Apparently, acoustic or electromagnetic processes could not explain the properties 1, 2 and 3.

There are experiments suggesting that living organisms and particularly humans can influence not only measuring devices but also other living organisms. We briefly describe below results of three experiments where human operators by their intent affected electro-generating fish, microorganisms and a plant.

Human operators' influence on electro-generating fish

Experiments were conducted in 1982 by G. K. Gurtovoy and A. G. Parkhomov in the Laboratory of Fish Orientation at the Severtsov Institute of Evolutionary Morphology and Animal Ecology.[2] The behavior of the electro-generating fish, *Cnathonemus peterii*, under the influence of operators was studied. It has been noticed that *peterii* is extremely sensitive to various external influences, changing the frequency of electrical impulses generated. Two series of experiments were performed in one-year interval that included 72 trials of sensitives' directed influence on fish.

Quite a sophisticated set of detecting and analyzing equipment was used and measures were taken in order to isolate the aquarium from external electromagnetic, sonic, vibrational, and light interference and to make operators' influence perceptible. The aquarium was placed into a Faraday cage on a buffer support and wrapped in several layers of a black fabric. A sensitive was sitting about one meter away from the aquarium mentally calming down the fish or mentally putting a second imaginary fish near the one present. Seventeen operators performed the experiment, but only eight of them managed to reliably change the parameters of pulses generated by the fish. On the other hand, these eight operators had 21 successful attempts out of 25. It is important to note that under the operator influence the pulses always became less frequent, whereas the "usual" influences (light, sound, and change of temperature) caused more frequent pulsations. Fig. 7 shows the averaged result of the experiments.

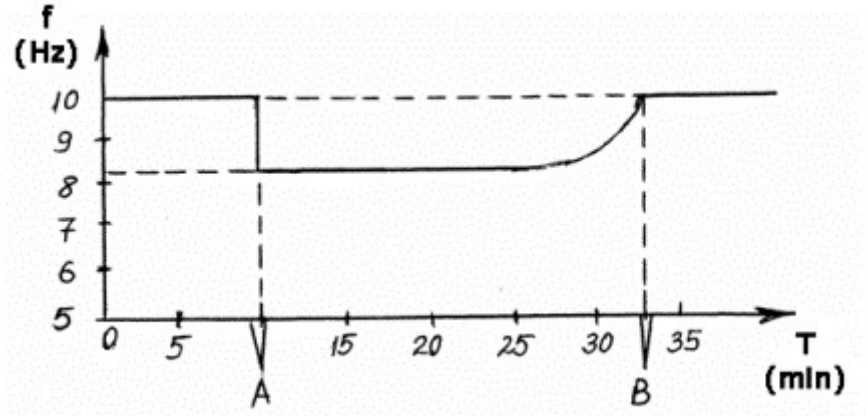

***Fig.*6 Average frequency of the pulses generated by the *Gnathonemus petersii*.**
f –frequency of pulses (Hz), T– time of observation (min); A and B – the beginning and the end of operators' effort
.

The experiments with *Gnathonemus peterii* have shown that some people are capable of reliably establishing a 'psychic' contact with a fish. However, using this effect as a bio-indicator for routine research is not expedient: the technique is very complicated and measurements are taking too long.

Human operator influence on microorganisms

From May 1988 to December 1989, the Tomsk Medical Institute team of researchers headed by K. Chernoshchiokov conducted experiments on operators' effect on microorganisms.[6] Experiments have shown various metamorphic transformations of certain microorganisms into others within the same enterobacteria family, as judged by morphological criteria commonly used in microbiology. Unfortunately genetic analysis in these experiments was not performed.

The technique used was as follows. One-day cultures of colon bacilli (No. 1257), typhoid bacilli (No. 335), Flexner bacilli 2a (No. 795), Sonne (No. 987) and B-43 (the culture obtained experimentally from the typhoid bacilli, which had no analogues in the intestinal family) were dissolved in a physiological saline. An operator exerted mental influence (the intent was not reported) on a closed saline-containing flask by holding his palms around it at a distance of 5 to 10 cm for 2-10 minutes. Fourteen sensitives took part in 91 series of experiments and 24 positive outcomes with transformation of the microorganisms were obtained. The following transitions were recorded.

The colon bacilli could transform into various bio- and serovars differing from the original strain by 5 or greater number of characters. Various biovars of nonpathogenic colon bacilli, enteropathogenic colon bacilli, and microorganisms designated by the researchers as B-43, which do not have analogues in the family of enterobacteria, were obtained from Eberth's bacilli. Various biovars of colon bacilli and fecal alkali were obtained previously from the dysentery bacteria; typhoid fever bacteria, various biovars of colon bacilli, and bacteria of the enterobacterium type were obtained from B-43.

The acquired characters were inherited in successive generations, which allowed the researchers to suggest that stable genetic changes took place. It should be mentioned that genes are biomolecules, i.e. quantum objects.

Human operator influence on plants

In the beginning of the 90's, members of the Biology Division of the Union of the Scientific and Engineering Societies under the supervision of E.V. Morozova conducted a series of experiments on a distant influence of a human operator on plants.[7] For that purpose measuring devices and plants -- cucumber and corn were used mostly -- were placed in a metal rounded chamber. The location of the sensitive varied from being next (about 0,2 m) to the plant to 5 m away from it in a different room.

The electrical reaction of plant's leaves -- particularly, the potential difference between the leaf and the root of the plant -- caused by impulses of light was measured. The registered activity lasted for 20 minutes. It is known that intensity of a plant's electrical reaction depends on the physical condition of the plant at the moment and can change due to many external perturbations. In the discussed experiments the operator's action played a role of such a perturbation. The operator acted on the plant for 3-4 minutes before the plant has been rayed by light.

In one of the experiments 91 of the total of 122 runs were control runs, 15 runs with the intent of suppressing the plant's reaction and 16 with the intent of enhancing the reaction. Authors found that sensitives influenced the physiological reaction of the plants with a 90% probability. The effect 1) it didn't

depend on screening of the plant from the sensitive and 2) it was independent of the distance between the operator and the plant.

The fact that the influence was "directed" was observed in another series. In 41 runs the operator with a very high probability influenced one (preselected) of two plants placed at a 40 cm distance from each other. This did not depend on whether the operator was in the same room with the plants or in a different room.

It is interesting to note that in order to establish a "contact" with a plant each operator performed a series of training exercises in close proximity to a plant, as well as in a different room, being able to observe the graphical changes of the registered parameters on a computer display.

What means "actions occur at a quantum level"

In the experiments described above action-at-a-distance of living organisms on other living organisms or devices could not be explained by the action of electromagnetic field or by acoustic or other known processes. It should be noted that there are other published scientific observations that cannot be explained by any of the known four fundamental physical interactions and that at least one yet-unknown physical interaction or "X-interaction" must be considered and studied.[8]

Analysis of the above experiments led us to the conclusion that the influence occurs at a quantum level. The action at a quantum level first of all means the impact on the wave function of a quantum object. The statement that the wave function is influenced arises from the assumption that the wave function describes real physical processes. We think that in our search for such a process we must deeply study properties of the physical vacuum.

We believe that the physical vacuum can be modeled as a superfluid consisting of pairs of fermions with zero total spin of the pair in an undisturbed state.[9-11] The model is substantiated well enough. The superfluid properties of the vacuum (zero viscosity while in motion) explain the observed nondissipative motion of celestial bodies in space. The presence of electrically unlike microparticles describes the dielectric properties of the vacuum and the generation of electrically charged elementary particles out of the vacuum.

Because of the lack of viscous friction any superfluid is able to sustain the structures (e.g. vortices) created in it and preserve them for a long time. But due to the assumption that superfluid consists of fermions, it has unique properties in this respect: stable spin structures may be created in it. Topological structures created in the fluid were studied in a number of fundamental works. In our view, one of such structures, the uniformly precessing domain (UPD), is of special interest. An UPD is created by particles whose spins precess with the same frequency. The energy of such a structure is determined as Sn, where S is the total spin of precessing particles, and n is the precession frequency. If we assume that S = h (Plank constant), we shall get the classical expression for the particle energy in the Schrödinger wave function. We suggest that such an identity of the expressions for energy is not occasional and that a bound particle, described by the Schrödinger equation, (e.g. an electron in an atom) creates a structure of the UPD type in the superfluid physical vacuum.

Thus, if the physical vacuum has the properties described above, quantum objects create certain structures in it that can interact with each other (for example, by means of a spin current, like spin currents in superfluid ^{3}He-*B*.[12] This interaction has a property of "selectivity" and does not depend on the distance between the interacting structures. We suggest that such interaction is the basis of the described above phenomena of telekinesis.

Based on our model of superfluid vacuum we can say that the described interaction is characteristic not only for living organisms, but also for the non-living matter. The following experiments related to those mentioned above illustrate this. In the experiments of G.K. Gurtovoy and A.G. Parhomov, the continuous registration of background signals of a noise generator showed that the intensity of the noise at the infra-low frequency is not constant. The analysis of a large amount of data recorded over the six-year period, allowed to obtain the period of change of the probability of the noise increase (fig.8). This period equals a half of a synodic lunar cycle, the rhythm that is more perceptible and more stable than the day cycle or 27-day period of the solar activity**.**

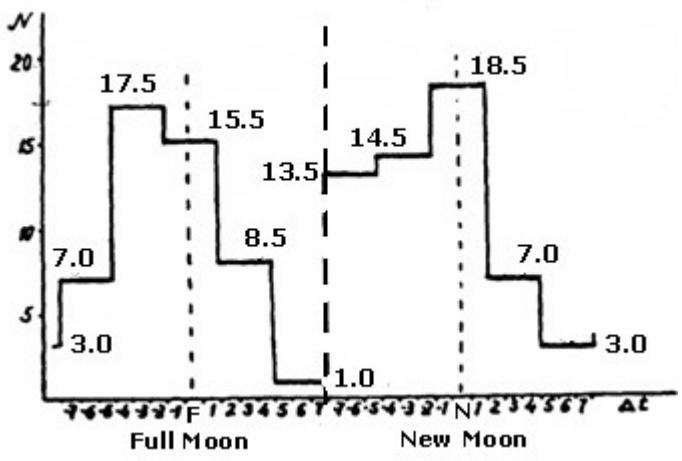

Fig.7. **The distribution of the total number (*N*) of increases in the amplitude of the infra-low frequency noise produced by various noise generators (bipolar and MOS-transistors, polycrystalline semiconductors) with respect to New Moon and Full Moon.**
Horizontal axis denotes the deviation from Full Moon and New Moon in days. Summarized results of the readings taken between October 1984 and August 1986.

As one can see, the noise generator in experiments of G. Gurtovoy and A. Parhomov registered the cosmic processes as well as the influence of an operator. (It must be pointed out again that this influence is not of electromagnetic nature.)

References

1. **Dulnev, G.N. (2000)** "*Energo-information exchange in nature*", St. Petersburg: IVA, [in Russian]
2. **Gurtovoy, G.K. and Parkhomov, A.G. (1992)** Experimental study of sensitive's remote influence on physical and biological systems, *Parapsychology and Psychophysics,* Moscow, **4,** pp. 31-51 [in Russian].
3. **Handel, Peter H. (1980)** Quantum approach to 1/*f* noise, *Phys. Rev. A* 22, pp. 745-757
4. **Gurtovoy, G.K., Parkhomov, A.G., Boldyreva, L.B., Sotina, N.B. (1991)** Action-at-a-distance of a sensitive on physical systems. *Proceeding of the Interregional scientific conference "Problems of Biofield"*, Rostov (Yaroslavsky), 21-26 [in Russian]
5. **Popov, Y.A. (2003)** Recognition of mental activity. *Proceedings of V International Congress "Folk Medicine of Russia»* A-RSICTFM «ENIOM», Moscow [in Russian]
6. **Chernoshchiokov, K.A. et al. (1990)** Acquisition of inherited variation by microorganisms of the intestinal group under the sensitives' biophysical fields, *Proceedings of the seminar "Aperiodical high-speed phenomena in nature",* Part 1, pp.57-59, Tomsk, [in Russian].
7**. Davydov, V.A; Dolin, Yu.A.; Morozova, E.V.; Shumov, D.E. (1993)** Studies of remote mental effect on plants with electric physiological records. *The Protocol of Parapsychological Association, 36 Annual Convention,* Toronto, Canada.
8. **Savva, Savely (2002)** Hypothesis of the biofield. *MISAHA Newsletter*, #36-39, pp.4-9
9**. Boldyreva, L.B. & Sotina, N.B. (1992)** Superfluid Vacuum with Intrinsic Degrees Freedom. *Physics Essays* **5,** p. 510
10. **Boldyreva, L.B. & Sotina, N.B. (1999)** *A Theory of Light Without Special Relativity?* Moscow, Logos, pp. 48-54.
11. **Boldyreva, L.B. & Sotina, N.B. (2002)** The Possibility of Developing a Theory of Light without Special Relativity. *Galilean Electrodynamics,* 6.
12. **Borovic-Romanov, A.S. et al. (1987)** Observation of Phase Slip at Superfluid Spin Current Flow in ^{3}He-*B*, *JETPh Letters* **45,** p.98, Moscow, [In Russian].