Crisis in Life Sciences. The Wave Genetics Response.

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Abstract: To create an organism, two genetic programs are required. The first one is geometric, i.e. a scheme, how to design the body. The second program is in the form of a meaningful text which contains instructions and explanations how to use the first program, how to understand and build the organism. These programs exist in the form of "DNA video tapes", which are used by the genetic apparatus, acting like a bio-computer. When the bio-computer reads these video tapes, sound and light images appear that constitute the movie program of the development of the organism. When the creation of a grown-up organism is completed, the movie ends. Then the second movie starts, which contains the instructions for maintenance of the organism for indefinitely long time. Unfortunately, the videotapes containing information about a perfectly healthy organism, get corrupted with time, errors accumulate (DNA mutations). The instructions accumulate errors and the organism gets sick, grows old and dies. It is very likely that these DNA video tapes can be renewed and corrected. With this new understanding of how our genetic apparatus works, completely new technologies for healing a person and extending a person's life become feasible. And this is the essence of Wave Genetics and its practical applications to come.

1. Genetics and its problems

"Central dogma" of genetics

The genetic apparatus of every organism on Earth, including humans, consists of chromosomes, where all genetic information of an organism, such as DNA or RNA, is stored. The paradigm or "Central dogma" of genetics and molecular biology states that:

1) The genetic apparatus operates as a purely material structure.

2) All the functions of genetic control of an organism are localized in approximately 2% of DNA, the so called coding DNA of an organism. The remaining 98% of the genetic apparatus code for nothing, and are garbage or junk DNA, which mainly represents a graveyard of virus DNA.

The 2% coding DNA code for proteins and RNA. Note however that the genes of a human, a fly, a warm or a plant are almost indistinguishable.

Biologists and geneticists use the language of analogies and metaphors to explain how the genetic apparatus operates. The genetic apparatus consisting of 46 chromosomes is viewed as a library consisting of 46 volumes or books. Each book (a chromosome), contains a text (instructions of how to build an organism) which consists of sentences (DNA) made of words (genes). And each word (a gene) consists of 4 letters (certain "chemical letters"), i.e. the "genetic alphabet" consists of only 4 "letters". The material realizations of the DNA molecules are famous double helixes, consisting of segments which are genes. In essence, the genetic apparatus operates as follows. The texts, written in the "DNA language", are first translated by the organism into the "RNA language" and then into the "Protein language". And proteins are the stuff that we are mostly made of (not counting water). Proteins perform two principal functions in the organism: they metabolize substances that we eat and participate in the morphogenesis, i.e. development of the spatial-temporal organization of an organism.

Here texts are 2% coding DNA, which are matter and matter only, like a physical book. And the analogy with a book ends here.

What genetics currently cannot explain

We point here to some important well established facts within genetics which the "Central dogma" of genetics cannot explain. As everyone knows, huge biological differences between different species are transmitted from parents to children. In other words, there are huge genetic differences between different organisms. At the same time, genes and proteins are practically the same for different species. Hence one can think about proteins as a set of "bricks" that can be used to build and maintain all kind of "houses", i.e. organisms: plants, animals, humans. One unresolved problem: **how to explain huge differences in the morphogenesis, i.e. in the development of an organism from an embryo, between different species?**

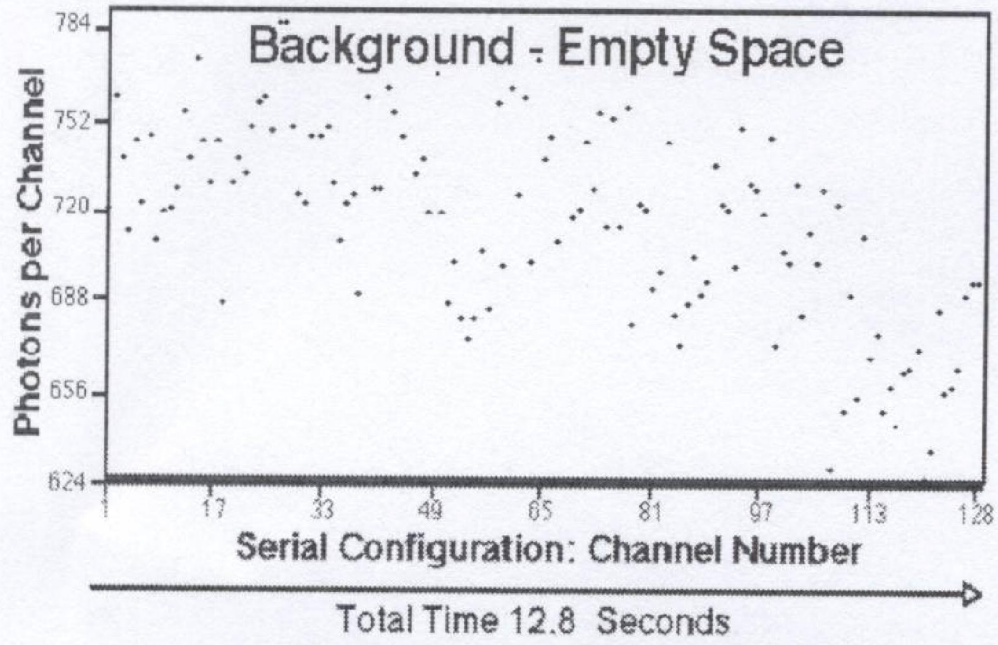
The genome (total sum of all genetic material) of an organism cannot consist of 98% garbage. This is nonsense from the perspective of evolution, which throws away anything unnecessary. Geneticists and embryologists discovered existence of special proteins which determine the shape and size of particular parts of an embryo, i.e. a hand, an ear, etc. However, this description contains a key unresolved problem, namely, some of these proteins are synthesized in one place of an organism, while their action in the form of a command is immediately expressed in another place of the embryo separated from the first one by hundreds of cells. There is no explanation for this immediate distant transmission of the command.

2. Experimental data questions "Central dogma" of genetics and the paradigm of life sciences

Some critical experimental data has been rapidly accumulating over the recent decades. This data unambiguously points to significant gaps and inconsistencies in "Central dogma" of genetics. Moreover, this data challenges us to find the courage in ourselves to rethink and revise the whole premise of our understanding of the nature of life. We summarize here the highlights of this data.

<u>DNA phantom effect</u>

A quartz cuvette with a DNA sample is moved from one location to another. And a trace, a phantom, is left in the air in the original location of the sample. This phenomenon was registered using the laser spectroscopy method by P. Gariaev in 1984 in Russia and by the group of R. Pecora in 1990 in the U.S.A. Gariaev also investigated the stability of the phantom and he found the following. After blowing the phantom away by the gaseous nitrogen, it comes back in 5-8 minutes. And the phantom disappears completely after 1 month. We remark that sound waves radiated by the DNA molecules were registered in these experiments.



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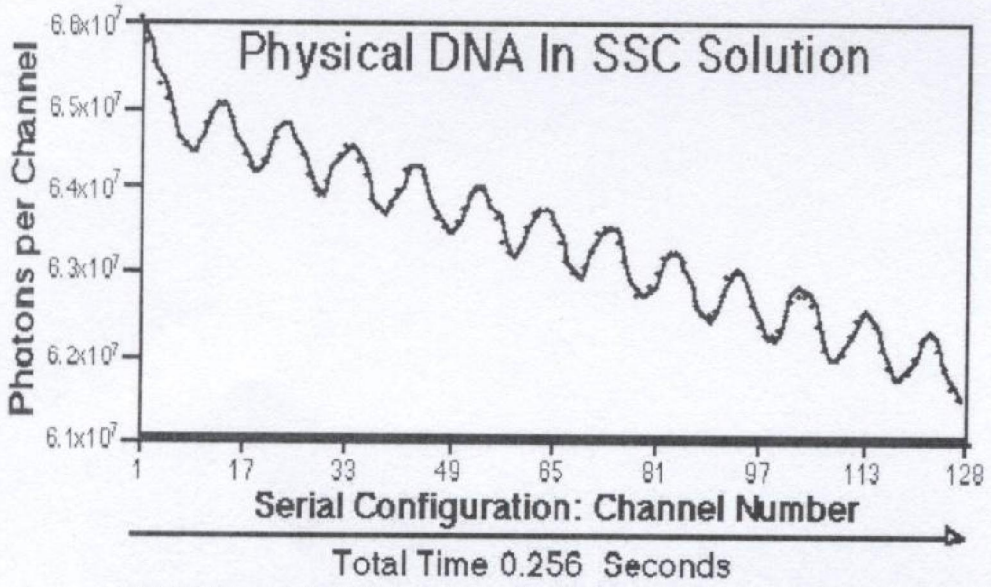

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Auto-correlation

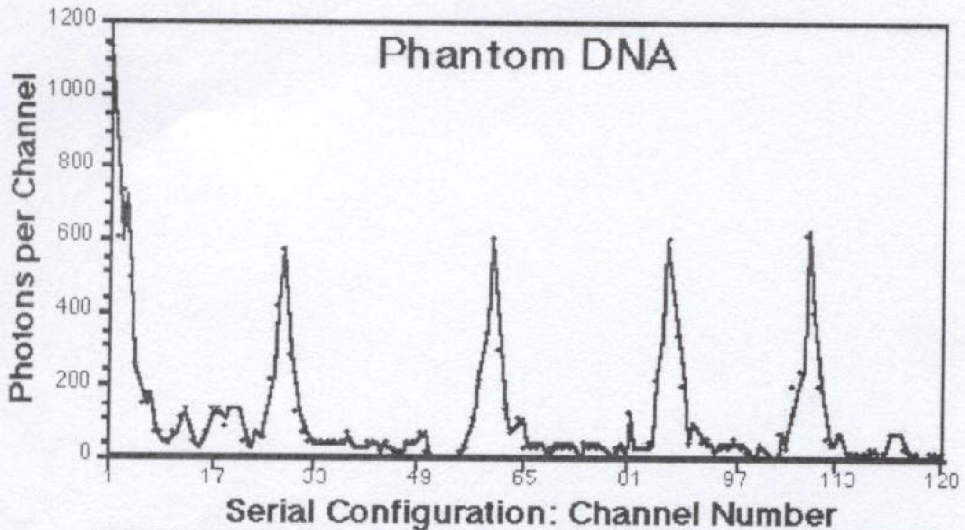


Figure captions for Figs. 1a-1d: Appearance of a "DNA phantom" when using a correlation laser spectroscopy (Spectrometer "Malvern") method.

a. The background spectrometer readings before introduction of a water solution of a DNA sample.

b. DNA sample in the form of a water solution (3ml, 1mg/ml in a quartz cuvette) is inserted into the spectrometer. The dynamical spectrum of fluctuations of DNA molecules is registered.

c. The cuvette with the DNA sample is removed from the spectrometer. One would naturally expect to see the background spectrometer readings, as in the 1-st figure. Instead, however, the spectrometer registers the presence of certain fine structures, a "DNA phantom", in the same location where the cuvette with the DNA sample initially was.

d. The spectrometer readings in 10 minutes after the removal of the cuvette with the DNA sample. After the cuvette part of the spectrometer was cleared by gaseous nitrogen, the spectrometer started giving the background readings, like in the Figure 1a. above, but within 5-8 minutes a "phantom" was registered again. This procedure was repeated many times, and each time a "DNA phantom" would return. Approximately in one month the "phantoms" gradually disappeared, or ceased to be registered, shifting beyond limits of sensitivity of the spectrometer.

Effect of multi-replication of the DNA sample and of some objects surrounding it

In 2005 a group conducted by P. Gariaev in Russia performed the following experiment. DNA samples were exposed to electromagnetic fields in certain frequency ranges. As a result, various luminous wave structures were created in the air nearby. They were recorded on film. These amazing phantom structures were found to move along complicated trajectories. Moreover, they mimicked the shape of the DNA sample and some objects surrounding it.

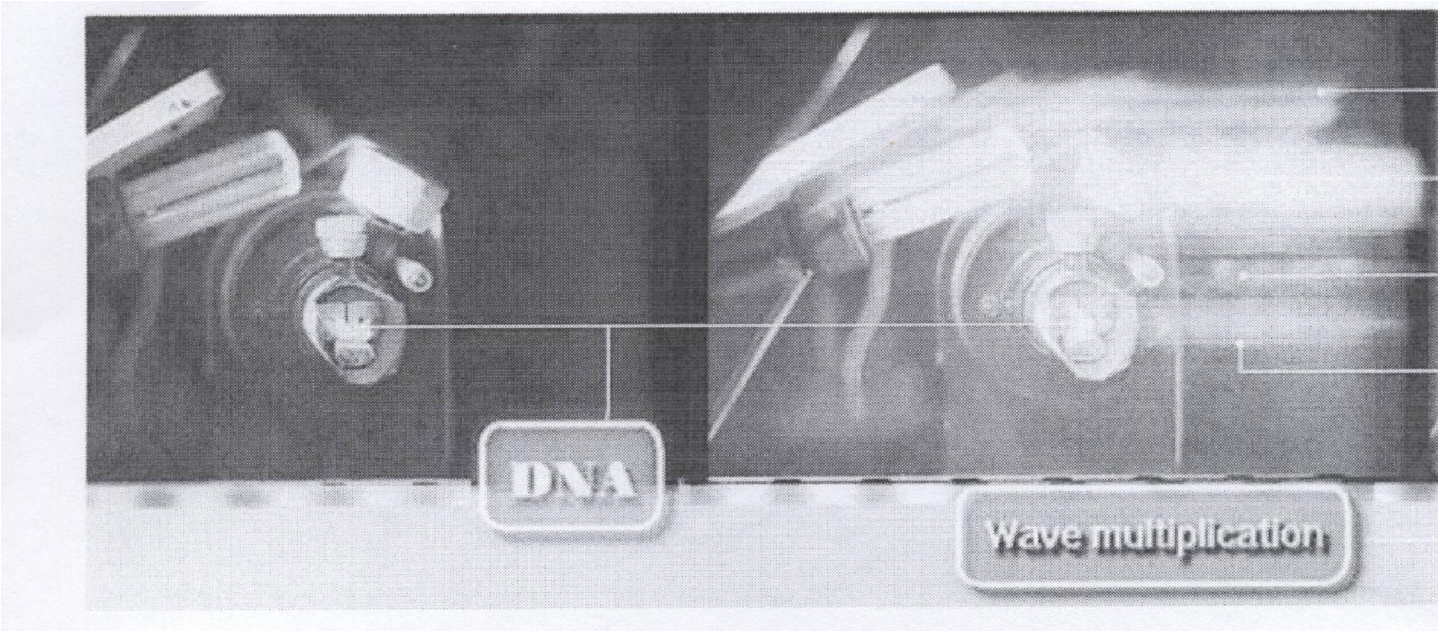
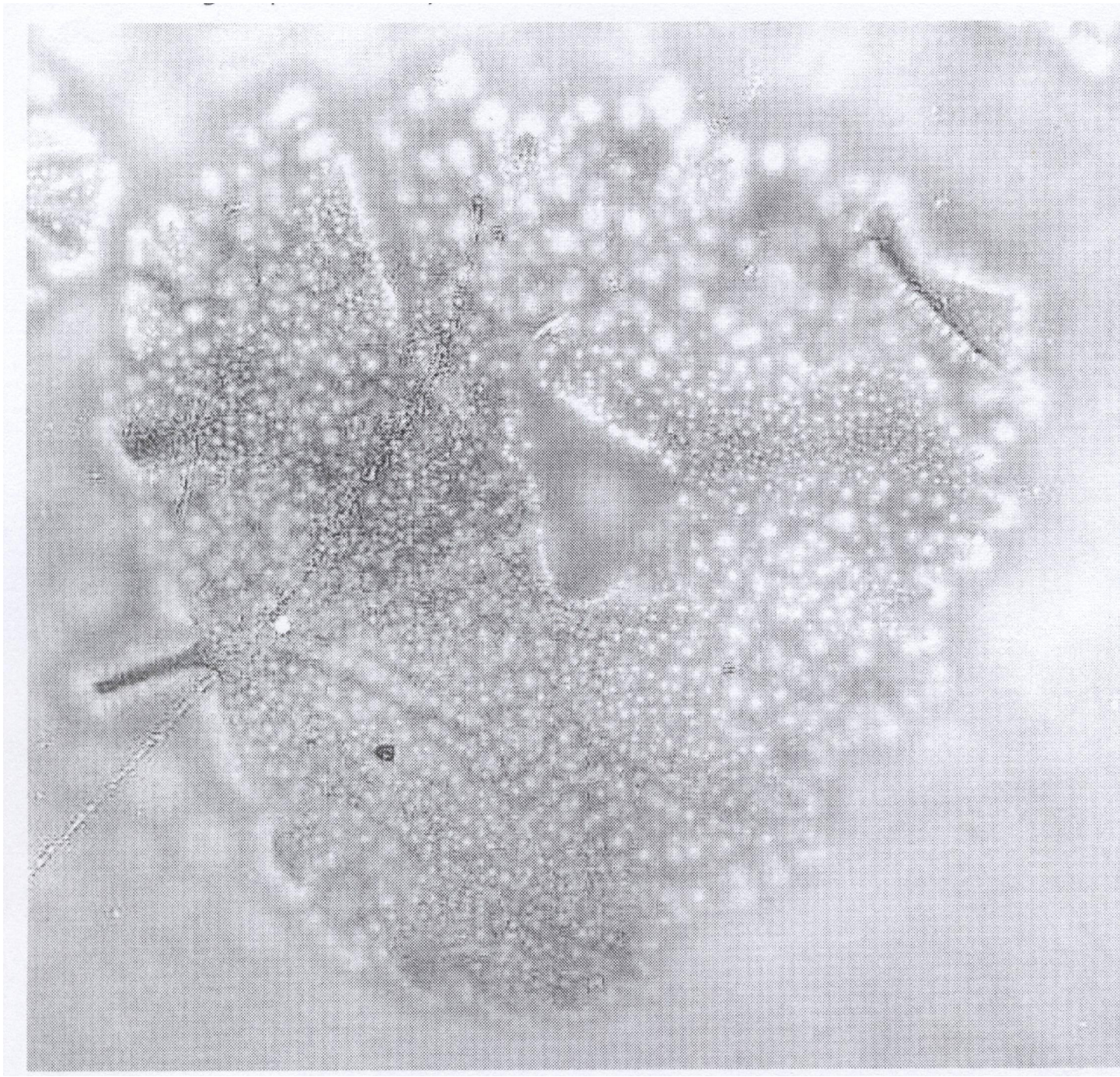


Figure 2. Effect of multi-replication of the DNA sample and of some objects surrounding it. A DNA sample from a cow's spleen in the form of an air dried preparation is placed in a cell made of aluminum foil. The sources of the excitation EM (electromagnetic) fields in the range from ultra-violet to infra-red ranges are placed above the preparation. On the left: the control, the sources of the EM fields are switched off. On the right: the experiment, the sources of the EM fields are switched on. Several luminous wave patterns are visible. They are replicas of the DNA, of the light sources and of the equipment used for the DNA excitation. All the replicas initially move to the right.

However, once the DNA preparation is touched mechanically, the replicas start moving to the left, and then disappear in 5-8 seconds.

Phantom leaf effect

In 1975 V. Adamenko in Russia performed the following experiment. After a part of a living leaf was cut and the remaining part was placed into a high frequency electromagnetic field, a visual image of the whole leave appeared. In other words, a phantom image of the cut part appeared which lived for 10-15 seconds and could be recorded on film. The experiment was reproduced by the Gariaev group and many other laboratories in the world.



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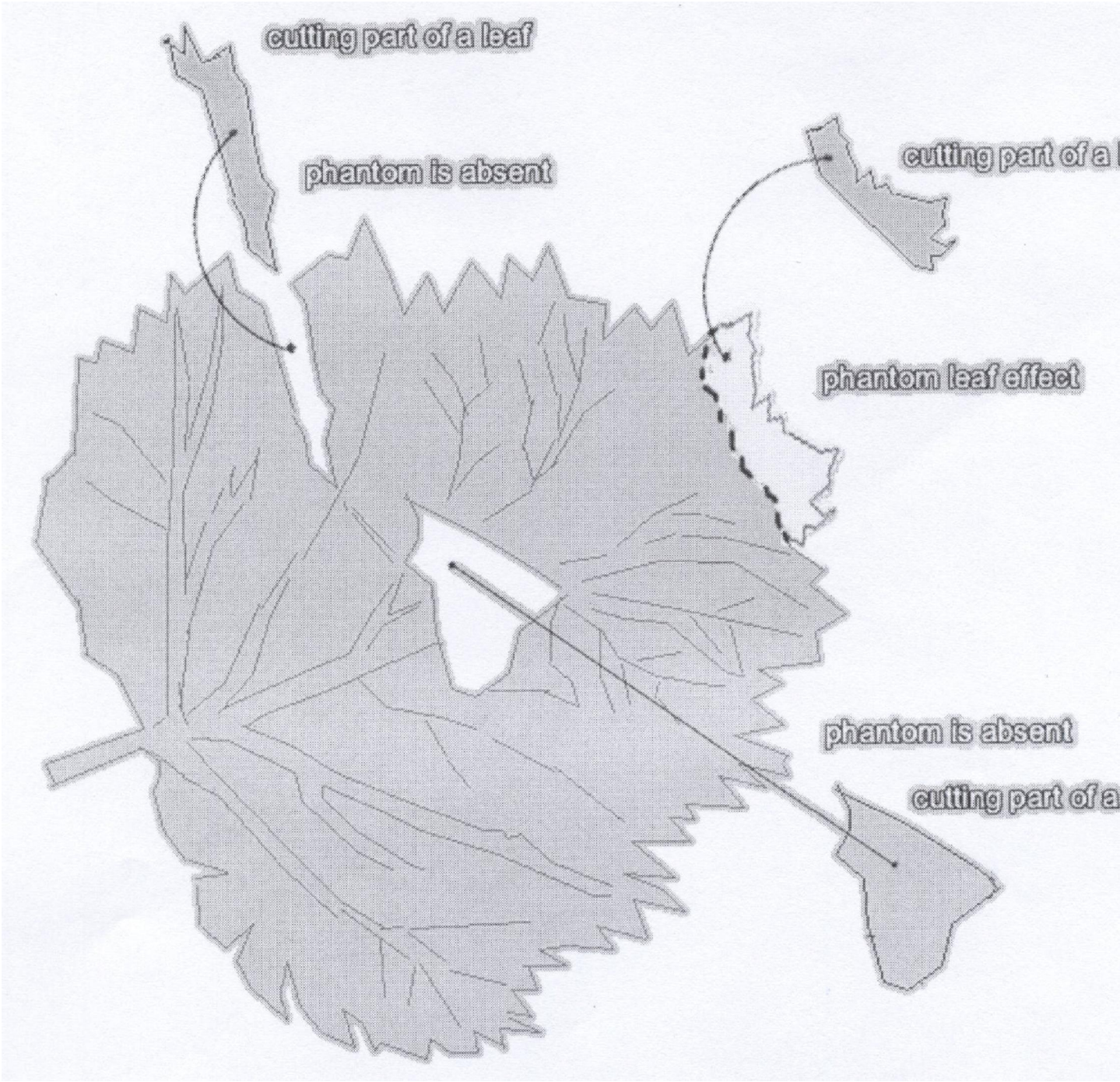

Cytopathic (cell pathological) "mirror" effect

During the period from 1980 to 1990 a group of V. Kaznacheev [1] in Russia performed a series of experiments to investigate the following phenomena. Two identical cell cultures were placed into hermetically sealed glass containers separated from each other by a quartz barrier. A pathology was introduced into one of those cultures. Within 2-3 days the second cell culture displayed the same pathology.

Distant interaction between embryos

In 2000 V. Burlakov in Russia discovered the following phenomena. Two embryos of certain fish in different embryonic stages of their development were placed into hermetically sealed glass containers separated from each other by a quartz barrier. After several weeks the embryos started to display malformations. And what is even more interesting, the types of malformations were dependent on the differences in embryonic stages of development between the two embryos. In particular, for the same embryonic stage of one embryo, different embryonic stages of the other one induced different malformations for the first one. According to the established embryogenesis theory, and biology in general, any distant interaction between embryos is impossible.

Holographic transmission and programming of morphogenetic information

In 2000 V. Budakovski in Russia performed the following experiment. He recorded a fragment of a tissue of a raspberry plant on a hologram using a red laser and then transmitted the hologram to a raspberry plant tumor (callus). After several months the callus developed into a raspberry plant – something for which modern biology has no explanation.

Wave genes heal diabetes in rats

These are more advanced experiments than those described before, and they are based on the principles and technology of Wave Genetics (see section on Wave Genetics below). Three series of experiments with identical protocols were conducted by P. Gariaev's groups Moscow, Russia (2000); in Toronto, Canada (2001); and in 2005 Nizhni Novgorod, Russia (2005). The goal of the experiments was to **test new technology for regenerating damaged pancreas. (**The pancreas is an endocrine gland which has several important functions, the major one being the production of insulin, a hormone responsible for sugar metabolism.)

A control group of rats was injected a lethal dose of a poison called *alloxan* which destroys the pancreas, the organ responsible for insulin production in an organism. As a result, all the rats in the control group developed type 1 diabetes (high blood glucose concentration level) and died within 4-6 days. Then the same lethal dose of *alloxan* was injected to another group of rats. When the rats in this second group reached the critical condition, they were exposed to healing wave information. As a result of that exposure, the sick rats got healed: their blood sugar level got normalized and their pancreas got regenerated. This healing wave information was produced by a laser bio-computer when the laser beam scanned the healing matrix. The healing matrix was created when the bio-computer read information from the pancreas and spleen which were surgically removed from healthy newborn rats of the same species as those used in the *alloxan* experiments.

One can explain the results of the experiment using the following analogy. The pancreas gland contains DNA-movies with information about healthy condition of the pancreas in its genetic apparatus. And this video morphogenic information programmed the stem cells of sick rats to regenerate their pancreas gland. The combined statistics for all 3 series of experiments shows that almost **90% of the rats had their pancreas gland restored and consequently recovered.**

In some of the experiments the bio-computer was modified to allow successful transmission of the healing information to sick rats at the distance of up to 20 kilometers. Note that no known physical fields have the capability to transmit such extremely week signals with such unbelievably powerful results.

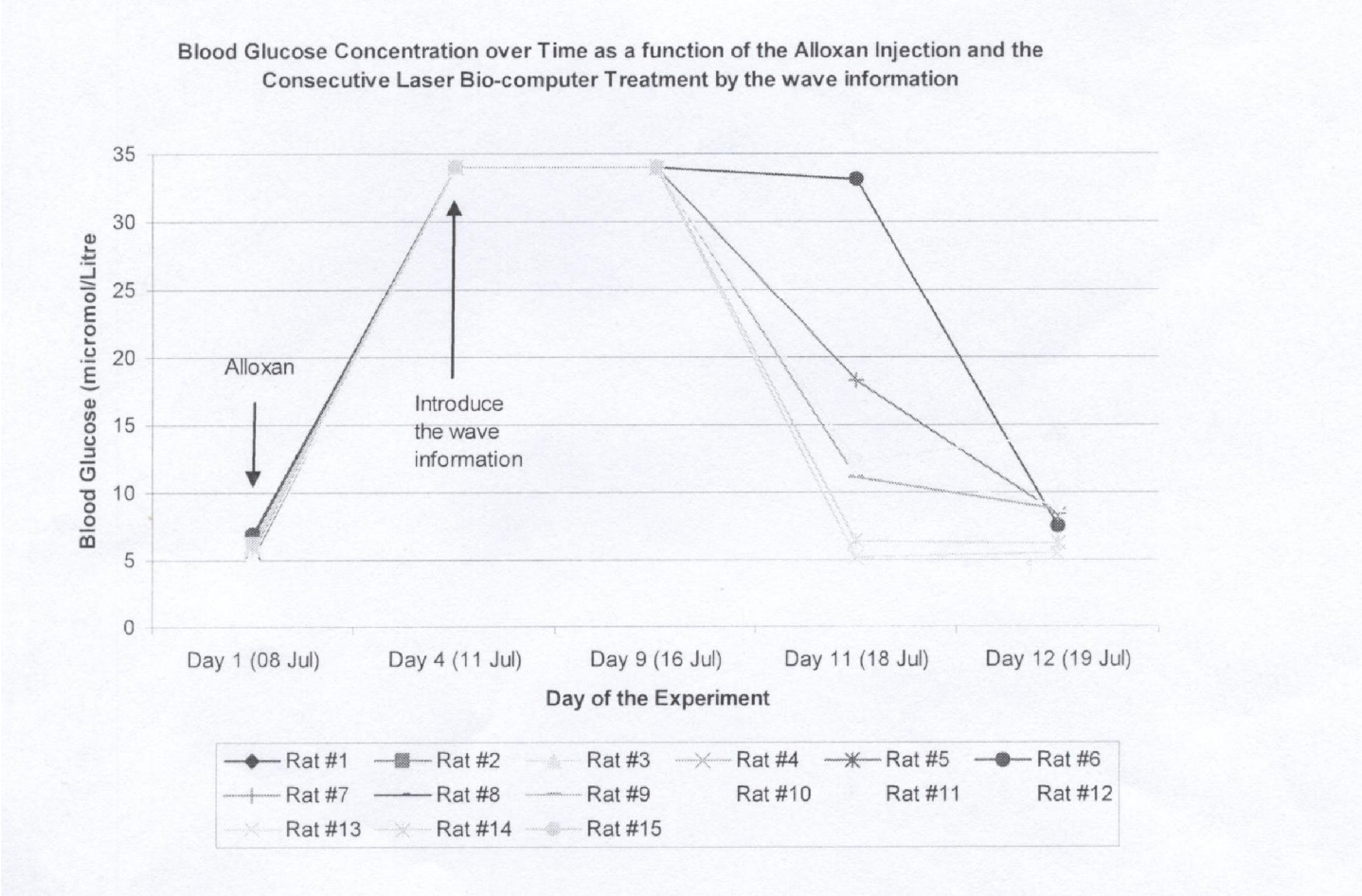

Figure 3. Blood Glucose Concentration over Time as a Function of the Alloxan Injection and the Consecutive Laser Bio-computer Treatment by the Wave Information. In this experiment, the distance from the healing matrix, scanned by the laser beam, to the sick rats was 1cm.

3. A new paradigm for life sciences

The experimental data presented above represents critical evidence that forces us to conclude that some key elements are missing in our current understanding on life. In other words, **our western scientific paradigm is incomplete**. We now articulate an extended paradigm which provides a natural and simple conceptual framework to account for those experiments. Of course, many researchers made contributions in this area and we do not claim originality. We hope that our emphasis on connections to experimental data will stimulate research in this new and exciting area.

We are guided by a famous principle in philosophy of science known as Occam's razor principle. This principle says that one should always make the simplest possible or "minimal" theoretical assumptions to account for new knowledge being incorporated into an existing theory. We remark that the Wave Genome theory being developed by the group of P. Gariaev is one of the first examples of a **scientific theory** emerging within this new paradigm, as outlined below.

Postulates of the new paradigm

1) All living organisms consist of two substances: the **material substance** and the **energy-informational (EI)** (or subtle) **substance**.

2) The key property which distinguishes the EI substance, and the corresponding EI field, from all substances and fields known in modern physics is that the EI substance is omnipresent, i.e. it is present simultaneously at each point in the space of our three dimensional material world. This means, in particular, that the distance between EI substances of any two material objects in our three dimensional world is always zero, no matter how far they are located physically from each other.

3) In agreement with Postulate 1), we assume that each living organism exists at two levels: the **material level** and the **EI level**.

4) The two levels of an organism are intimately linked with each other and affect the condition of each other as well as reflect the condition of each other. Moreover, the **EI level is the leading one**.

5) We define **life as a dynamic exchange of energy and information between a physical organism and its EI (or subtle) counterpart**.

Application of the new paradigm to explain the anomalous experimental data

We illustrate here how our extended paradigm can easily account for the experiments described in Section 2.

DNA phantom effect. This experiment can be interpreted as follows. In the process of taking the laser spectroscopy measurements, a laser ray was sent to the DNA sample. During that time some information and energy was transmitted from the DNA sample to its counterpart at the EI level. After the (material) DNA sample was removed, the process of transmission of information and energy was reversed. **Specifically, the DNA sample at the EI level was still at the same place, and it started sending information and energy back to the same physical location from which**

the material DNA sample was removed. And as result, a DNA phantom was detected at the same physical location.

Distant interaction between embryos. This experiment can be interpreted as an exchange of information and energy along the following chain (the first embryo at the material level) -> (the first embryo at the EI level)) -> (the second embryo at the EI level) -> (the second embryo at the material level). Obviously the directions in the chain can be reversed.

Wave genes heal diabetes in rats. This experiment can be interpreted similarly to the previous one. One difference would be the following. To explain transmission of the healing information to sick rats at the distance of 20 kilometers without energy expenditure, we need to take advantage of Postulate 2), which in this case says that **the distance between EI pancreatic DNA recording in the wave bio-computer and the EI pancreatic DNA of sick rats is zero, and hence we do not need energy to transmit the information.**

4. Wave genetics: Brief historical perspective

The concept of biological field has been developed by a number of researchers. Due to very limited space, we only mention two names. A. Gurvitch in Russia around 1920 pointed to a necessity to introduce the concept of biological field of a chromosome, as complimentary to genes, to account for special organization of an organism. According to R. Sheldrake, UK, creation may be viewed as a living organism. This ancient concept challenges the notion of the universe as a mechanism with God as the great mechanic. His theory of "formative causation" implies a non-mechanistic Universe, governed by laws which themselves are subject to change. The hypothesis of morphic resonance and morphic fields that he has developed is as an alternative to mechanistic thinking in biology. The concepts of Wave Genetics of Gariaev and his group have been nurtured by the existing tradition that has facilitated their breakthrough in both experimental and theoretical directions.

5. Basic principles of Wave Genetics

1) The 98% “garbage DNA” is not actually “garbage DNA”, but a **supercode**, and this code (or codes) are of a **higher** level than those coding RNA and proteins. This “higher level” is the **“wave level”**.

2) The genome is a quasi-intelligent system.

3) The function of the wave level of genetic coding is to program the spatial-temporal organization of an organism.

Traditionally, genetics talks about DNA, RNA and proteins' speech and texts only. The standard linguistic structures of genome are realized at the material level in the form of sequences of "chemical letters" in a DNA chain consisting of the 2% coding DNA. In Wave Genetics the texts are realized at the material level in the form of sophisticated dynamic holograms (gene-holograms) in liquid crystals of the chromosome continuum.

DNA wave bio-computer

Short term information on gene-holograms is the result of interference recording on the intercellular water structures of spatial light and sound images of the current condition of cells. And these images are read by the light and sound radiations of the chromosomes, transmitted to the neighboring cells informing them about the condition of the cell sending the information. Such an operation is performed by each cell in the organism, and there billions of those. Thus all the cells in the organism form a combined unified informational space, which functions like a DNA wave bio-computer. This bio-computer processes, in real time, information about metabolic processes in cells.

Another type of bio-holographic information is of morphogenetic nature, and therefore it is fixed for a particular organism. It changes in time very slowly in the process evolution of bio systems and is inherited. The DNA wave bio-computer a quasi intelligent system, which operates with its own languages, similar to human ones, which we are only beginning to understand. **The linguistic structures of genome at this level are *true* speech and *true* texts.** By this we mean that quasi intelligent decisions are made regarding regulation of the structure and functions of an organism and its parts.

Genome: a quasi intelligent system

Classical genetics has discovered experimentally that genetic RNA texts contain ambiguous words (homonyms) which may have more than one meaning, and the choice of the meaning is determined by the context. The significance of this discovery which was missed by genetics, is as follows. These words (homonyms) code critically significant molecules: proteins. If such a word-code has two meanings, and one of them is wrong for creation of a particular required protein, this will result in a biochemical accident and death of the organism. So, for example, the word 'ring' can code two different meanings: *'a circle'* and *'a place of competition'* of boxers. In order to give the precise and unique meaning to a homonym, the genetic apparatus must first *'comprehend' the* meaning of the RNA text and only then make a decision, what precise meaning to give to a word-homonym. This example clearly illustrates that the genetic apparatus has quasi-intelligence and is capable to quasi-thinking at the molecular level and at the level the genome-biocomputer.

6. Perspectives

We now have a paradoxical situation in genetics, molecular biology and medicine, in general, that is both grave and promising at the same time. The 10-year long effort of mapping the DNA sequences of humans (the Genome Project) is now complete - all the letters and sequences of human DNA codes are known. Thanks to these results, the forces of trans-genetic engineering have been gathering momentum. Already, scientists have introduced artificial gene sequences into sets of plants, animals, and bacteria, which are being used as carriers of these artificially introduced genes. Such experiments have been thought to hold great potential in human health applications, promising possible cures for many diseases and disabilities, and in the creation of disease resistant food stuffs, promising a greater abundance of food.

Paradoxically, the more success we have in such genetics and molecular biology technologies, the farther we seem to be from understanding the actual foundational principles, the inner workings, of the genetic codes. So far, successes in this direction have mainly been concerned with functions of particular gene sequences that act to fabricate various proteins, which are building materials for cells. These particular gene sequences comprise only 2% of the genetic memory found in the chromosomes. The other 98%, the major part of the chromosomes, is not understood by genetics, and has for some odd reason been labeled as "junk" DNA. Many hypothesis have been brought forward to attempt to account for the reasons for the existence of this "junk" DNA - from arguing that this 98% majority of the DNA might be acting as "assistants" for the primary DNA sequences to rationalizing that this 98% majority of DNA arises as a "cemetery of viruses", a rather tenuous notion.

To ignore, or to, so critically, underestimate the role of 98% of the human genome, is an appreciable error. Moreover, whether we correctly see the true role of the genetic information represented by the known 2% of the DNA, is still an open question, especially in the situation where the remaining 98% of the DNA is presently "terra incognita", an unknown terrain. Presently, our understanding of DNA is very limited. With our present understanding, we cannot cure cancer, we cannot resist AIDS, we have not defeated tuberculosis, nor can we at present prolong significantly the lives of people. Initial promises of bright future, based on creations of trans-genetic research, have actually turned out to be only dangerous trans-genetic foodstuffs, hazardous to the biosphere on which our very lives depend. The cloning of animals has produced only ugly and useless creatures, or animals that grow old and die abnormally rapidly, as in the well-known case of the cloned sheep, Dolly. And it is quite natural that these results cause alarm within the scientific community.

A large group of Swedish scientists has recently raised these issues in a number of articles [2]. How are we to escape from this condition of an abundance of flawed and dangerous experiments, where many inconsistent and hazardous results are caused by lack of proper understanding of 98% of the DNA sequences, and a dramatic deficiency in understanding the true foundational principles of the operations of DNA, the chromosomes, and the human genome? This same group of Swedish scientists has pointed that one of the principle directions for improving our understandings of DNA is represented by developments such as the DNA-wave biocomputer paradigm [3].

The essence of our ideas, which have already found some practical applications, is the following. We proceed from very simple strategic reasoning. For success in our attempts to treat various medical problems and to sharply slow down the processes of human aging, it is clearly necessary to understand the languages by which cells communicate with each other. We have managed to accomplish this, to some extent. It appears that the languages we were looking for, are, in fact, hidden in the 98%, "junk" DNA contained in our own genetic apparatus [4]. The basic principle of these languages is similar to the language of holographic images [5] based on principles of laser radiations of the genetic structures [6] which operate together as a quasi-intelligent system, as in

[3] It particularly important to realize that our genetic devices actually perform real processes which supplement the triplet model of the genetic code, as shown in [8].

In earlier publications related to these processes, some of their previously unknown organic properties are brought into play. At what stage of development is this new knowledge and what can it bring us? We are making the first steps in investigating the mechanisms of the relevant physical processes and developing mathematical descriptions of the informational processes, which occur in genetic structures. We have produced some laboratory equipment that allows us to accurately model the informational functions of the living cell and its DNA. Such devices represent the first quantum bio-computers. These devices have allowed us to carry out distant multi-kilometer transfers of some genetic/metabolic information; the introduction of this information into a bio-system-acceptor; and has allowed us to perform strategic management functions of bio-systems, biochemical systems, and actual physiological conditions [10]. In particular, we have found that it is possible to restore endocrine glands in animals, and the same approach seems to be promising to considerably slow down the aging process in humans.

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