

Information Basis of the World Structure, Universe Origin and Teleportation Phenomenon

Alexander Ya Temkin

ABSTRACT

In the present paper some consequences of the information quantum structure are considered. It is pointed out that objects of the *material* world are built of information quanta. Note that the concept of *matter* never was and apparently cannot be defined as a *fundamental* concept, but we customarily use it forgetting the logic. In other words, the matter and the information is the same entity appearing differently at different situations, or, exactly, at different kinds of observation. In this pair the *information is the fundamental concept*, while the matter is the secondary one. The teleportation is considered from this point of view, which means that in all cases, including the material object teleportation, at the end it is reduced to the information teleportation.

Key Words: information - matter relationship, teleportation, universe origin, universe structure, new galaxies

NeuroQuantology 2012; 3: 532-536

1. Introduction

In the present paper we shall try to check the role of the information in the connection with objects that we got accustomed to call as belonging to the "material world". The first problem with what we shall be occupied is whether the abovementioned objects and the information are different things or, maybe, they form the same entity (Stonier, 1996) that is displayed differently in different situations, or, exactly, at different kinds of measurements performed by observers (Pagliani and Chakraborty, 2005a; 2005b)?

Let us suppose that the information has quantum structure, *i.e.*, consists of *information quanta* (Pagliani and Chakraborty, 2005a; 2005b; Wolski 2006). If there is a set of more than one information

quanta, information of a quant may order, in particular, the joining of a number of quanta, maybe even a big number of them, in clusters, as well as the inverse operation, *i. e.*, the decay of such clusters of quanta. Thus, complicated constructions from big, even enormous number of information quanta could be built without use of building units of any other (than information quanta) kind, but only of information quanta. In other words, the World, including that what we often call "matter" could be built as consisting of information quanta only.

If this hypothesis is correct, the teleportation (Eaton, 2009; Bouwmeester *et al.*, 1998; Mochon, 2006; Graham, 2004; Luther, 2011; Al-Amry *et al.*, 2010, "Full body teleportation system" – patent application, United States Patent and Trademark Office) of material objects should be reduced to the teleportation of the information. Note, as it was established in (Temkin, 1982; 1999; 2011) the information sent by telepathy is transmitted by "human De-Broglie waves" the speed of which is not limited by that of light.

Corresponding author: Alexander Ya Temkin

Address: Department of Physical Electronics, Wolfson Building,
Faculty of Engineering, Tel-Aviv University, Ramat-Aviv, Tel-Aviv
69978, Israel

✉ temkin@post.tau.ac.il

Received Jan 28, 2012. Revised March 10, 2012.

Accepted April 21, 2012.

eISSN 1303-5150



Thus, it could be expected that the teleportation also can be superluminal.

Whether the information carried by all information quanta forming the considered "material" body, must be teleported to its teleportation? It is well known from computer science that usually only relatively small .exe file (installation file) must be transferred from the source and downloaded to a computer and, thereupon, the transfer of a program is ended by its installation inside the computer without any supplementary transfer from the source. This example suggests the idea that in the case of a body teleportation it is to be built and to teleport to the destination a convenient "installation file" carrying relatively small amount of the information, but such that is able to initiate and guide "the installation", exactly, recreation of the teleported body at the destination. However, the nature is not a computer adapted to such kinds of the installation, so it would be naturally to suppose that the probability of a successful recreation and, therefore, the whole teleportation process should be very small. Fortunately! In the opposite case the human life (if mankind succeeded to arise under such conditions!) could be disorganized and being terrible because, for example, teleportation to the Earth a lot of different living beings and dangerous physical bodies. *Emphasize:* namely teleportation, but not arrival amino acids *etc.* to the Earth on meteorites and so on, *e.g.*, (Grant, 2010; Lang, 2010). The study of conditions and ways of the recreation is a very important purpose of future researches. Amino acids a. o. organic compounds found in Cosmos, including the Solar system, that are supposed to be those which initiate the life, are, possibly, analogs of such installation .exe files, no matter whether they arrived simply by means mechanic movement (like installation files transferred on CD or on on-key memory devise), or, which is apparently very rarely, were teleported. Their "installation" on the Earth may occur (almost) promptly or (very) slowly, *e. g.*, when it is an evolution process.

It would be interesting to clarify how and under what conditions such sets of information quanta can be constructed, on which CRs (chains of relations) and thereupon ACRs (activated chains of relations) (Temkin, 1999) could be defined. Then quanta of information can form a thought or thoughts (Temkin, 1999) produced, for example, by the

thinking, but not without fail those of human beings, may be even of the Universe or its parts *etc.* (Mensky, 1991). In (Temkin, 1999; 2011) the problem is discussed, whether set of thoughts can leave the brain and begin the independent existence outside. If yes, the considered thoughts built of information quanta themselves really could create such objects that we usually call the "matter". In other words, the spirit can create the matter. According to written above, principally is possible that a teleported thought or a set of thoughts may be an analog of .exe file, the installation of which would be the "material", maybe living, object recreation. Thus, this object can be considered as teleported by means of the telepathy.

When there is a set of information quanta, a quant from this set or an "outsider" could informationally (*i.e.*, by means of the information exchange) interact with this set of quanta. It may command other quanta to create new combinations of them. In this case the information value of this quant may be defined using, for example, the count of different combinations created by its orders.

Define now the notion of elementary quant of the information as quant, the amount of the information of which is the smallest that can be detected by any observer. Note that such a quant of the information can command to sets of quanta to create complicated systems constructed of information quanta that can be different for different initial quanta. Thus, a smallest quant of the information can create, in particular, by chain processes, complicated constructions made of many information quanta. Principally, the number of quanta in such a system and the type of its construction are not limited, and therefore it would be supposed that the whole World can be built from information quanta.

2. Notes on the Observers

For this consideration one needs to define the general concept of the observer not limited by a human being, human made constructions, *e. g.*, automaton, *etc.* In other words, observers (at least one) must exist in the World even when there is no living being and never was. If there is no observer, this means the World does not exist.

On the observation mathematical theory and its connection with the information



quantum structure we recommend our readers the following articles: Pagliani and Chakraborty, 2005a; 2005b; Pawlak, 2002; Wolski, 2006. Notice that, according (Pagliani and Chakraborty, 2005b), "any information is a quantum of information". We shall continue this statement: any information is a quantum of information that is an elementary information quant or combination (linear or nonlinear) of elementary information quanta. In the case of a linear combination we shall speak on the superposition.

Example

If there is only one information quant, it is not enough that the statement on the Universe existence could be meaningful. The necessary and sufficient condition of that is that there are at least two information quanta able to interchange of the information between them. Then one of these two information quanta could play the role of an observer.

Thus, the cosmological problem of the Universe origin should be formulated in terms of information quanta without use the concept of space-time. Then the Universe initial state could be defined as the state built of two information quanta.

It would be the beginning of the Universe creation. As it is seen from the written above, this creation could be initiated even by the most primitive observer, *e. g.*, one of two elementary information quanta. However, in the continuation of the Universe creation process, exactly, its development, may participate much more complicated observer(s) being inside its already created parts, *e. g.*, inside a Galaxy. This means, that Galaxy may create other galaxies using only information way, possibly star may create new stars by the same way, if observer(s) are inside this star.

As it can be concluded the amount of the information, its value or, more general, values, its subject, meaning and content, all they are important for these processes.

It is necessary to establish how the information can be transferred from one information quant to another. If there are two information quanta *A* and *B*, we *define* that *A* and *B* is in contact, if there is the exchange of information between them.

3. Remark on the Information Quant Definition

Try to consider possible mathematical structure of an information quant. Let

$$\exists(G = \{g\} \neq \emptyset, M = \{m\} \neq \emptyset),$$

where $M = \{m\}$ and $G = \{g\}$ may be final, countable or continuum sets. In general, elements *m* and *g* of these sets are abstract mathematical ones representing properties and objects, correspondingly (Pagliani and Chakraborty, 2005a). Set $Q = G \otimes M$ represents an information quant, iff

1) $\exists[|-G \otimes M]$, *i. e.*, the fulfillment relation,

$$2) \left[\exists(G_{\rho_u} \cup G_{\rho_{u'}}) \left(\begin{array}{l} (\rho_u \subseteq \{\rho\}, u' \neq u \Rightarrow G_{\rho_u} \cap G_{\rho_{u'}} = \emptyset) \\ (\forall G_{\rho_u}) \subset \{(\rho \in \mathbb{N}) G_{\rho} \subseteq G = \{g\}\} \end{array} \right) \right]$$

3) it is possible to define the information amount on the set $G = \{g\}$ and

4) $\exists[G_i, \text{with } N_{G_i} < N_G, \text{ satisfying conditions 1)-3)]$, where N_G is the power of the set *G*, if *G* is an infinite set, or the number of elements in *G*, if it is a finite set.

4. Sets of Information Quanta

We define: The exchange of information between two elementary information quanta means that instead these two quanta (which disappeared) appears one information quant (not elementary) possessing sets

$$M^{(2)} = \{m^{(2)}\} \text{ and } G^{(2)} = \{g^{(2)}\},$$

which are functions of sets

$$M = \{m\} \text{ and } G = \{g\}, M_1 = \{m_1\} \text{ and } G_1 = \{g_1\} :$$

$$(M^{(2)}, G^{(2)}) \stackrel{def}{=} (M^{(2)} \otimes G^{(2)}) = F((M, G, M_1, G_1)) \quad (1)$$

This process remains the annihilation and creation particles in the secondary quantization, where they are performed by the corresponding operators. In the future it must think on the definition of such operators for the representation of the described interaction between information quanta.

The abovementioned process can be real as well as virtual. In the case when there are only two information quanta, their *real* fusion means the disappearance of the Universe that, however, may be born again, if the quant,



created by this fusion, decays: $M \otimes G + M_1 \otimes G_1 \rightleftharpoons M_2 \otimes G_2$. If it decays not in the same quanta that were before the abovementioned annihilation, but the products are other quanta, then another Universe is created than was before. If processes of fusion and decay are repeated again and again, it will be "a twinkling Universe". This possibility should be taken into account and considered in cosmological theories, especially, on the Universe origin.

Consider it in detail. Generalize a little bit our notations. Attribute to each elementary information quant the index $\chi \in \mathbb{N}$ and denote by the upper index (ν) where $\nu \in \mathbb{N}$, the number of considered elementary information quanta. Then use $M_1^{(2)} = \{m_1^{(2)}\}$ and $G_1^{(2)} = \{g_1^{(2)}\}$ instead $M = \{m\}$ and $G = \{g\}$, use $M_2^{(2)} = \{m_2^{(2)}\}$ and $G_2^{(2)} = \{g_2^{(2)}\}$ instead $M^{(2)} = \{m^{(2)}\}$ and $G^{(2)} = \{g^{(2)}\}$, etc, if more than two elementary information quanta are considered. In the general case we can write

$$M_{\chi}^{(\nu)} = \{m_{\chi}^{(\nu)}\} \text{ and } G_{\chi}^{(\nu)} = \{g_{\chi}^{(\nu)}\} \quad (2)$$

The abovementioned fulfillment relation can be now rewritten as follows:

$$\mathbf{Rel}_{fulf} = \exists \left[\left\| \bigotimes_{\nu=1, \chi_{\nu}}^{\nu_{\max}} \langle G_{\chi_{\nu}}^{(\nu)} \otimes M_{\chi_{\nu}}^{(\nu)} \rangle \right\| \right] \quad (3)$$

where $\left\| \right\|$ is the symbol of entailment: $A \left\| B$ means the sentence A entails the sentence B .

If an elementary information quant exchange of the information with a number >1 of other ones (with a *cluster*), it can be written as follows:

$$\mathbf{Rel}_{fulf}(\nu_{\max}, \nu_{\max} + 1) = \exists \left[\left\| \bigotimes_{\nu=1, \chi_{\nu}}^{\nu_{\max}} \langle G_{\chi_{\nu}}^{(\nu)} \otimes M_{\chi_{\nu}}^{(\nu)} \rangle \right\| \bigotimes \langle G_{\chi_{\nu_{\max}+1}}^{(\nu_{\max}+1)} \otimes M_{\chi_{\nu_{\max}+1}}^{(\nu_{\max}+1)} \rangle \right] \quad (4)$$

The concept of the space and, therefore, of the distance is not yet introduced, so instead the distant interaction one must consider the interaction of the elementary information quant with the other ones, as occurring via subsequent exchange of the

information with a number of intermediate quanta such that one of them is exchanged of the information directly with the considered cluster of quanta. It is interesting the case when the set of intermediate quanta can be ordered. Then the mathematical formalism developed in Chapters 1-3 of (Temkin, 1999) allows one to define a set that would be a kind of *time substitute*. The main problem to do it is to find phenomena that could be used to construct and order this set of information quanta.

5. Conclusions

In the present paper we considered some consequences of the information quantum nature (Pagliani and Chakraborty, 2005a; 2005b; Wolski, 2006). It was pointed out that each observed object can be constructed of information quanta. Thus, objects that we customarily consider as material ones really are built of information quanta, which means that *the information is the fundamental entity while the matter is the secondary one*.

In view of this the teleportation of material objects could be reduced to the teleportation of the information, exactly of the information quanta sets. It was indicated that there is an analogy with the transfer of software from the source to a certain computer: it is enough to transfer to computer only a relatively small installation .exe file and thereupon to install it inside this computer. So it is not necessary to teleport the whole information (= the whole material object) forming this object, but only an analog of the small installation file that in the case of the teleportation we shall call the *recreation file*. However, there is a big difference between the software transfer to a computer and the teleportation. Installation file is created to be able to initiate and guide the program installation in computer of a given type, while the *natural* structure at the destination place may be irrelevant to the recreation process provoked and guided by the recreation file. Therefore, it would be naturally to suppose that the teleportation probability is very low. So the expedition *source – destination – source* by means of the teleportation seems almost impossible because it is necessary to perform two steps, each of which possessing very small probabilities, and as result, the probability of this expedition would be extremely small product of them.



References

- Al-Amri M, Evers J, Zubairy MS. Quantum teleportation of four-dimensional qubits. *Phys Rev* 2010; A 82:022329-1-7
- Bouwmeester D, Pan J-W, Mattle K, Eibl M, Weinfurter H, Zeilinger A. Experimental quantum teleportation. *Phil Trans R Soc Lond A* 1998; 356:1733-1737
- Eaton K. Scientist Teleport Particles a Few Meters, Beaming Up Kirk Still Far Off. *New Scientist* 2009; Feb. 3
- United States Patent and Trademark Office. Full body teleportation system - patent application. United States Patent Application 20060071122, Kind Code A1, St. Clair; John Quincy. April 6, 2006.
- Graham S. Quantum Teleportation across the Danube Demonstrated. *Scientific American* 2004; 19: 4-5
- Grant A. Is Deep Space the Birthplace of Life Across the Cosmos? *Discover magazine* Nov 2010. <http://discovermagazine.com/2010/nov/31-deep-space-birthplace-life-cosmos> Accessed date; May 7, 2012.
- Howard RA. Information Value Theory. *IEEE Transactions on System Science and Cybernetics* 1966; 2:22-26.
- Lang KR. NASA's Cosmos. 3. Meteorites. http://ase.tufts.edu/cosmos/view_chapter.asp?id=19&page=1 Accessed date; May 7, 2012.
- Lither A. Light wave teleported without data loss. URL: light-vawe-tel.pdf 2011; 18th April.
- Sherson JF, Krauter H, Olsson RK. Quantum teleportation between light and matter. *Nature* 2006; 443: 557-560.
- Jin X-M, Ren J-G, Yang B. Experimental free-space quantum teleportation. *Nature Photonics* 2010; 4: 376 - 381.
- Mensky MB. Time in Quantum Cosmology from the Self-measurements of the Universe. *General Relativity and Gravitation* 1991; 23 :123-127
- Mochon C. Introduction to Quantum Teleportation. 2006; <http://lightlike.com/teleport/teletalk.pdf> Accessed date; May 7, 2012.
- Pagliani P, Chakraborty M. Information quanta and approximation spaces. I: Non-classical approximation operators. *GrC IEEE International Conference on Granular Computing* 2005a; 605-610
- Pagliani P, Chakraborty M. Information quanta and approximation spaces. II: Generalized approximation space. *GrC IEEE International Conference on Granular Computing* 2005b; 611-616
- Pawlak Z. Rough Set Theory and its Applications. *J of Telecommunications and Information Technology* 2002; 3:7-10
- Stonier T. Information as a basic property of the universe. *Biosystems* 1996; 38:135-140
- Temkin AYa. Parapsychology from the Point of View of Modern Physics. *European J Parapsychology* 1982; 4:257-280
- Temkin AYa. Some Ideas on Information Processing, thinking and genetics. Tel-Aviv University Press, Tel-Aviv, 1999.
- Temkin AYa. Extrasensory Perception as a Natural, But Not Supernatural Phenomenon. *NeuroQuantology* 2011; 9(1): 157-165.
- Wolski M. Similarity as Nearness: Information Quanta, Approximation Spaces and Nearness Structures. *Proc CS&P Informatik-Berichte* 2006; 49: 424-433.

