

## Concerning Issue of Substance Radiation

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### *Abstract*

*In the article are examined tests, conducted for study of the phenomenon “of quantum behavior” of the electrons in experimental physics.*

*Has been expressed a supposition that any type radiation of the substance, including light, comprises of two constituent parts: radial and wave radiation. They are variants of qualitative matter and energy, which spread in space with a great speed without mingling in each other. Radiation doesn't comprise of charged particles having mass of immobility. Their occurrence takes place during propagation of radiation in space.*

*Electron is a particle and not a wave-particle as this is stated by leading scientists of quantum mechanics.*

As it is known, a substance being in a certain state, has ability to radiate energy, field having electromagnetic qualities or substance stream (or simultaneously both) and also in a different conditions – to absorb energy and modify.

All good of the modern civilization (radio transistor, television, computer, metro and all transport facilities working on current and other) became possible after was ascertained that electromagnetic forces transmit in space by means of fields and variable magnetic field causes variable electric fields in space (and vice-versa).

Modern physics, in the theory of elementary particles, ascertained that even when neither particle is found in space, vibrations of electromagnetic field take place; in the vacuum appear and disappear elementary, so called virtual particles, which in certain conditions have ability to transform into real particles. And modern quantum electrodynamics already describes a process of light radiation and absorption by the electrons being in the atom composition.

Did physics come to such important result? As it is known light represents a minor, but an important part of broad spectrum of substance radiation.

During several centuries the scientists were trying to determine what does light represent – corpuscles or waves. Over the time of the entire history of science development opinion concerning nature of light was periodically changing. M. Planck's discovery of quantum of energy and action at the frontier of XX century to a certain extent changed opinions on light, but dualism in this issue has not been exterminated to the end. Corpuscles were changed by light quantum - photons. Scientists could examine events concerning propagation of light only from the wave standpoint and light influence on substance (photoeffect, Compton event) was being defined only on the basis of opinion concerning corpuscles and photons [1. 2].

Photon is a quantum of electromagnetic field – elementary particle, participating only in electromagnetic interaction and does not participate in a weak and strong interaction. Thus, a certain unusual picture is obvious: one and same object (light or  $\gamma$  radiation) simultaneously

behaves as a particle so as a wave. De Broglie supposed: as light waves have qualities of the particles, it's possible that particle electron has a wave quality, i.e. it, as light, is characterized by dualism [3]. Many physicists accepted a wave-particles reality. Though it wasn't easy because as we know, wave is indeterminable in space and a particle is concentrated at the point. But, it was evident that these incompatible modes together were giving a full reflection of microworld reality [2].

There appeared a standpoint that quantum event doesn't subordinate to the ordinary logic. Heisenberg in the theories reflecting microworld brought in algebra of matrix graphs, on which is written probability of events and not any values reflecting an event. He relied on the conception of electron as a particle and processes, as quantum interruptibility [2]. E. Schrodinger selected another way. He created wave mechanics for the microworld, which he described by ordinary order of mechanics description: he was conceiving an electron as a wave and vibrations - as continuous process.

Exists standpoint concerning quantum mechanics that by using probability we beautify our personal uncertainty in circumstances and ignorance of nature history. And nature itself really knows to absolute precision. Classical physics never had doubt about it. [4]

Nils Bohr in scientific disputes with the colleagues often indicated: "It's time to come to an agreement that we do not understand something important!" [4]. By bringing in a complementation (complementarity) principle to the microworld physics, N. Bohr attempted to make incomprehensible clear. He stated that from the classical standpoint, qualities with difficulty connecting with the reality do not exclude but fill each other.

And Heisenberg with the same purpose mathematically deduced a law of correlation of ambiguity, which is equal to the statement that nature is not at all exact [2. 3].

Author of the present article considers that he has enough solid foundation to express the following opinion: it's the physicists' opinion on existence of wave particles in nature, in particular, conception of electron as of wave-particle, does not correspond to the facts, as they rely on the incorrect analysis of the experimental results, which is caused by difficult theory existing on light nature. We shall attempt, to the extent possible, to confirm this consideration. We consider that at the initial stage, for this will be enough to consider many tests conducted by the physicists in the past with the purpose of study of the electron behavior and conclusions inferred proceeding from them. "Feynman's lectures on physics" will assist us in this [5]. Chapter 37 of the book under the title "Quantum behavior" starts with detailed examination of the tests conducted by bullets, waves and electrons and analysis of the received results. Physicists believed that for comprehension of the electron behavior is necessary to oppose with them a behavior of solid particles and water waves. That is why they used first one then second conception to ascertain what would happen in certain conditions.

Common scheme of the above mentioned tests was as follows. Researchers in different experiments used sources of solid particles, waves and electrons (machine gun in case of solid particles, water launcher and waves "source" – object which vibrates by means of small engine in perpendicular direction of the water surface and causes sphere waves in it – in case of water waves and electronic ejector – in case of electrons). Proper flows received from them were preceded by impermeable wall; in the middle part it had two clefts of identical size situated not so far from each other, in which flow, coming from the source, ran without obstacles. An absorbing structure was placed after the wall. In the test conducted by the bullets, the role of the absorber was fulfilling breastwork, in the experiment conducted on water waves – sand bar, in electrons test – metal plate. A detector (sand box, waves' height (intensity) measurer and

particles counter (for instance Geiger counter) was fastened to them. It was possible to move a detector along the wall and ascertain probability of hit of the substances under research in points, distant from its centre by various distances. (In case of water waves was interesting determination of distribution of the waves' intensity on the axle).

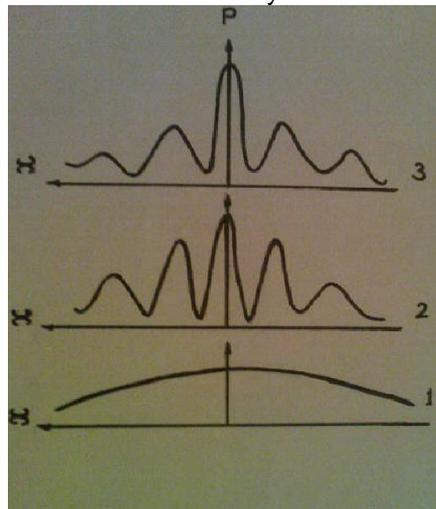


Fig. 1

On figure 1 are given results of the conducted research – received corresponding curves.

Received curves apply to two types; first type curve is received in case when interference does not have place in the test. Second type curve (2) in case of water waves is received when after the waves come through two clefts takes place diffraction and interference. Curve 3 received in the issue of the test conducted with electrons turned out to be similar of the waves and curve received in case of the waves is similar of the curve 2, i.e. electrons revealed wave nature and gave us interference picture. On the basis of the examined result was made conclusion that electron is “wave-particle”. After much discussions, concerning how could electrons give received picture of distribution on absorbing surface, the test was repeated with the slight difference that behind the first wall, between two clefts, was placed a source of strong light so that to precise ways of electrons movement. It is known that electric charge has a quality to disperse light fallen on it. That is why light dispersed by electron falls in to the observer's eye and the latter will see where the electron passed. Was received unexpected result: curve 3 changed type and resembled curve 1. When lamp was turned off, again appeared interference picture, curve 3 resembled curve 2. Was made a conclusion that electron, when it is observed, behaves in other way and it is possible that “electron is something very delicate”. “It is not within our power to explain how it works” – says Feynman, “we just can tell you what did the tests show” [5].

Heinzerberg admitted that in the discussed test is revealed a principle of indefiniteness. Feynman writes in his lectures: “Complete theory of quantum mechanics, which we use today during description of atoms and i.e. entirely substances, depends on correctness of a principle of indefiniteness, but, if anytime we will be given a possibility “to destroy it, quantum mechanics will start giving non-agreed results and we will be forced to exclude it from the row of correct, proper theories on nature events”. And one more pessimistic conclusion “from the lectures”: “no one has yet found solution of this puzzle (here are supposed results of the last examined test, author's note). Thus, now we are forced to limit ourselves by probability calculation. We say “today“, but doubt is serious that all this is already constant and cracking this nut is not within the power of a human's teeth as such is nature of the objects”.

Partially differing author's opinion is offered in this article for consideration concerning

the nature of light, also the events related to light and some puzzles resulting from the aforementioned experiments, in particular the behavior of electrons, which "is not like anything" according to the physicians' opinion.

In classical science it was considered that physics studies the events, where "the essence of substance is not changed", although, yet in the seventeenth century I. Newton in his "optics" together with other significant views was paying attention to the issue of light and substance interaction, he wrote: "can light turn into substance and vice versa?". As for modern physics, it studies the events, during occurrence of which "the essence of substance" is changed more deeply, than during chemical reactions. Such is a transformation of electromagnetic radiation into particle, which has non-zero immobility mass. The test has shown that the photon of significantly fast (more than the determined amount) vibration is transformed into a substance - positive and negative electrode.

On the basis of the considered in the article experiments, and taking into account the opinions, stated by the leading scientists of classical and modern physics concerning the nature of light and related to it events, it is possible to draw a conclusion as follows.

Any kind of radiation of substance, and inclusive of light, is of a difficult composition. It contains two parts simultaneously: radial and wavy radiation. They represent two different kinds of matter and energy. They include some charged particle of immobility mass, therefore it is proper to talk about double character of radiation - wavy and radial. Radiation is spread in the space at the known speed  $c=300\ 000\ \text{km/sec}$ .

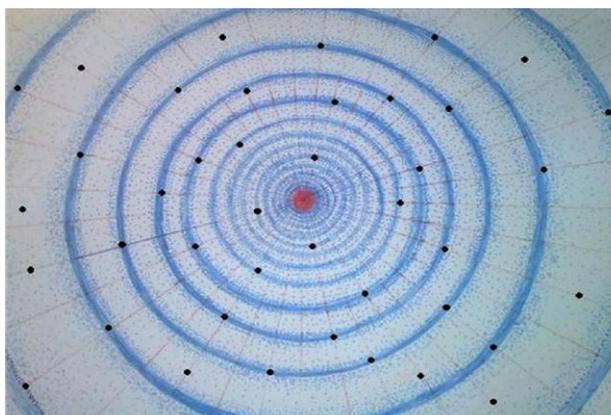


Fig. 2

Schematic figure of light waves and rays.

On the figure 2 is given the aforementioned scheme of propagation of light. At those points of the space, where the ray crosses the ridge of wave, which possesses maximal meaning of energy, by adding of these two energies (radial and maximal wavy) are created the conditions, in order to originate a solid, charged particle (or through hardening a virtual particle, or through discharging an electrode from any atom). Probably, they would not have an initial speed (or it would be smaller than the speed of light), and they would be easily gripped by the ridge of light wave (like a rake on the ridge of sea wave). Therefore, the trajectory of electron movement will get a wave form, i.e. the electron will reveal the feature, which it does not possess as usual. This can explain a diffractive picture of the electrode movement after passing two gaps, obtained in the aforementioned tests. Therefore, the conclusion is drawn as

follows: an electron is a particle and it is not "a wave-particle" or as it has been called by the scientists "microcentaur", which surprised the physicians of the twentieth century by its incomprehensible movement.

E. Schrodinger stated that "a moving particle is nothing but foam on wavy radiation". It is difficult not to remember the issues, which were considered by N. Bore due to the definition of "wave-particle", brought in physics: "may be the nature does not need certain initial conditions for its existence on the micro-level?" and one more - "aren't they "coordinate-void"?". The famous physicians in their debates and discussions tried to approach the truth about the movement of those charged particles, which showed up in the related to light events.

Let's remember I. Newton's idea on the nature of light: "I think that light is something that is differently propagated from luminous body. We can assume that light is a material emanation or movement, or an impulse, which causes movement, or something else... I admit only, that light consists of rays, which are different from each other by circumstances, amount, form or strength, as well as sand granules and lake waves differ". By the contemporaries' presenting of I. Newton, light atoms differ from substance atoms only by "rapidity" and "smallness". As S. I. Pavlov informs us, later I. Newton put forward a compromise hypothesis using the priorities of emissive and wavy ideas. I.E. Newton's true conception on light was the merging of corpuscle and wave faces. Modern physics has come to an analogical conclusion; light represents the merging of photons and waves. Thereby, the ideas stated by us concerning the nature of light should not be unacceptable for the modern physicians.

Taking into account all the aforementioned opinions, let's consider the experiment conducted for studying the behavior and nature of electrons, the result of which has created a big puzzle for the physicians and led them to the conclusion that we will never explain why is happening the event, which has occurred during the test: why was changing the curve, reflecting the allocation of electrons, on the electrons absorbing plate as a result of the bulb's switch on and off , and why was it receiving the face, characterizing sometimes solid particles and sometimes waves.

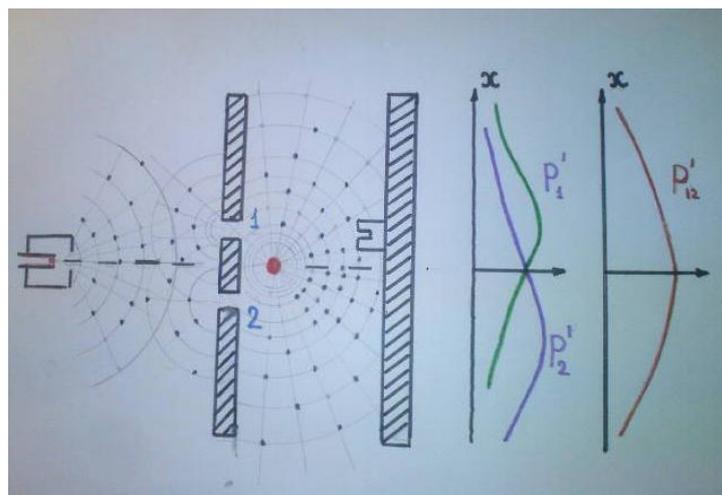


Fig. 3

The picture, depicting the scheme and the renewed results' analysis of the experiments, conducted for studying the behavior of electrons.

On the figure 3 is given the scheme of these experiments. It represents a tungsten wire, placed in the metal box, which is warmed by current. The front side of the box has a hole. Negative current is led to the wire, and positive current is led to the box. As the experimentators assume, the wire radiates electrons upon its heating, which by affecting the box walls obtain rapidity and some of them break out of the hole. Electrons have got a certain speed, at which they move and when they approach the front wall of the box with two holes, they break out of them and reach a detector, i.e. the counter of charged particles. As it was mentioned above, the curve of electrons allocation on X axis appeared to be depicting the interference.

According the aforementioned assumption, in the electron weapon from the tungsten wire, upon its shot, will radiate light as waves and rays, and not electrons. They appear in the space upon propagation of light on the ridge of wave and move together with this ridge. Thus, along their X axis, the curve of allocation will receive a face of wave, i.e. it will be depicting the interference.

When the aforementioned experiment was repeated with the difference that between the gaps and the absorbing walls was placed the source of strong light, it showed own picture of electrons' allocation on the absorbing walls by its radiation and emerged electrons. As the light waves did not break into two different gaps, they did not undergo interference and non-interferential picture was obtained. The second source of light was stronger than the first one, it was better than the first one and covered the interferential picture, received from it. Moreover, the direction of the propagation of lights waves and rays in the space, existing between the first and second sources, is opposite to each other and thus the electrons, coming from the first source could possibly not reach the counter.

Hopefully, on the basis of the aforementioned hypothesis it would be possible to explain the results of a number of other experiments and to formulate a new theory on the nature of light.

The fact that the substance, existing in a certain condition radiates energy, which in its turn, upon propagating in the space, affects the virtual particle, emerging from vacuum, and creates a new solid particle possessing charge and immobility mass - electron, really deserves the physicians' attention. It is not excluded that better studying of these events will lead us to the source of origin of world and evolution.

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# ნივთიერების გამოსხივების საკითხისადმი

ო. ლომაია

რეზიუმე

სტატიაში განხილულია ექსპერიმენტულ ფიზიკაში ელექტრონების „კვანტური ქცევის“ ფენომენის შესასწავლად ჩატარებული ცდები.

გამოთქმულია ვარაუდი, რომ ნივთიერების ნებისმიერი სახის გამოსხივება, და მათ შორის სინათლე, შეიცავს ორ შემადგენელ ნაწილს: სხივურ და ტალღურ გამოსხივებებს. ისინი ნატიფი მატერიისა და ენერჯის ნაირსახეობებია, რომლებიც ვრცელდება სივრცეში დიდი სიჩქარით ერთმანეთთან შეურევლად. გამოსხივება არ შეიცავს დამუხტულ, უძრაობის მასის მქონე ნაწილაკებს. მათი წარმოქმნა ხდება სივრცეში გამოსხივების გავრცელებისას.

ელექტრონი არის ნაწილაკი და არა ტალღა-ნაწილაკი, როგორც ამას აცხადებენ კვანტური მექანიკის წამყვანი მეცნიერები.

## К вопросу о природе излучения

О. Ломаия

Резюме

В статье рассмотрены опыты, проведенные в экспериментальной физике с целью изучения "квантового поведения" электронов. Высказано предположение о том, что всякого вида излучение и в том числе свет, состоит из двух составляющих частей: лучевого и волнового излучения. Они представляют собой два различных вида тонкой материи и энергии. Они распространяются в пространстве с большой скоростью не смешиваясь друг с другом. Излучение не содержит в себе заряженных, имеющих массу покоя частиц. Они возникают при распространении излучений в пространстве. Электрон является частицей, а не волно- частицей, как это объявляют ведущие ученые квантовой механики.