The Einstein posthumous phrase

Professor Vladimir Leonov

From the book of Vladimir Leonov: Quantum Energetics. Volume 1. Theory of Superunification. Cambridge International Science Publishing, 2010, 56-66 pgs.
Download free. Leonov V. S. Quantum Energetics. Volume 1. Theory of Superunification, 2010. http://leonov-leonovstheories.blogspot.com/2018/04/download-free-leonov-v-s-quantum.html [Date accessed April 30, 2018].

1.4. The Einstein posthumous phrase

> '***However, at the moment nobody knows how to find the basis of this theory*'** is the final phase in the final scientific study of the greatest physicist of the 20th century Albert Einstein published at the year of his death (he died April 18, 1955). The article **'Relativistic theory of the asymmetric field'** is barely cited by the physicist because in it Einstein practically rejected all the scientific knowledge to which he devoted his life and proposes to start everything anew.

Much has been written about Einstein and the theory of relativity but his posthumous will to his successors has not been analyzed. The point is that the theory of relativity was not completed by Einstein and after his death many investigators could not add anything significant to the theory. The history of science shows that science develops in jumps from genius to genius. Geniuses appear when a crisis arises in science and they eliminate the crisis by providing new knowledge. In gaps between the jumps new knowledge is required by the scientific community and the knowledge becomes the property of many. This takes many decades. However, nobody knows what to do next. This is the moment of appearance of another scientific crisis and it is necessary to await the arrival of the next genius in order to obtain new information for future generations

The scientific community exploits the knowledge of geniuses, thus living from them. This is the rule of life because scientists also need means. The theory of relativity has been mastered by many physicists who added something or changed something in Einstein equations, published scientific proceedings and books, defending thesis and obtaining academic titles and departments. In particular, for this wide scientific community, the Einstein claim that it is necessary to abandon everything that he did, and it is necessary to start anew, but he does not know how to do it, is unacceptable because it already affects their reputation. In order to have the undisputed scientific reputation, it is necessary to do more than Einstein.

However, if it is not possible to do more, it is better to not say anything about the Einstein's posthumous phase. Yes, he was a genius, a strange man, he could afford any trick, even show his tongue, this was how many perceived him.

It is natural that the majority of scientists do not possess the courage and adherence to principles of Einstein when scientific truth is more expensive than scientific reputation and career. No one forced Einstein to write such a frank scientific testament, he could have been silent. I attempted to analyze not only the reasons which forced Einstein to forego his scientific heritage, but also to trace the motion of his thoughts, to establish where he was right and where he was overcome by serious doubts.

The historians of science, yes even specialists, regards Einstein as the creator of the theory of relativity, at first the special theory of relativity (STR), and then the general theory of relativity (GTR). And only sometimes and that casually, they mention his work on the unified field theory, or more precisely the unified field theory. Einstein assumed that there exists, thus far inaccessible for the researcher, some united field which is also a carrier of gravity and electromagnetism. They are altogether only different manifestations of the unified field. If it is possible to penetrate into the essence of the unified field and to describe it mathematically, then it will be possible to combine gravity and electromagnetism. This was supported by the field theory in which gravity and electrostatics were described by a single differential Poisson equation. Moreover, the laws of the attraction of two masses and two electric charges had identical nature and it seemed that this is the manifestation of some forces, only in different measurements.

For a period of 30 years Einstein fanatically worked on the unified field theory, periodically publishing articles in which he noted that the result would soon be achieved. But time went by and there was no end to the work in sight. Friends and associates repeatedly attempted to dissuade Einstein from this hopeless occupation and they recommended studying quantum theory, especially because he was awarded the Nobel Prize for studies in this region. Young Landau (22 years) specially visited Einstein in 1930 in order to put him on the right track. But the effect was reverse, Einstein to the end of his life did not accept the statistical nature of quantum theory and continued his studies to the last day in order to finally forego its scientific heritage at the end.

Today, when reproaches come from all side to the address of the great physicist that it was his fault that physics came to a sequential crisis, and it is necessary to return to the concept of the universal aether which was allegedly buried by Einstein, I should come out in defense of the outstanding physicist. Several years ago I myself held the same opinion and personally

participated in several scientific conferences, including international, dedicated to the criticism of the theory of relativity and wrote four articles on this subject which I now reject and do not refer to them.

The reason for this is the following. After my discovery in 1996 of the quantum of space-time (quanton) and superstrong electromagnetic interaction (SEI), it was necessary to consider the quantized space-time as an absolute substance and I erroneously assumed that the concept of the absolute is incompatible with the concept of relativity. To this contributed publications of a number of the contemporary physicists who categorically asserted that the physical reality is the essence of the geometry of empty space-time and nothing more. In this case they referred on the authority of Einstein and the principle of relativity which allegedly was valid only for the empty space. My studies of the structure of the quantized space-time gave opposite results – there cannot be voids in nature. I was confident that I was right, but the idea of the relativity as the property of empty space interfered with my reasoning. It meant that it was necessary to subvert the theory of relativity which in addition did not work as the theory of the unification of gravity and electromagnetism.

But as I continued my calculations I became convinced that the principle of relativity is indeed the fundamental property of quantized space-time and that Einstein is right. I finally understood that I am on the right track. I cannot find a better teacher than Einstein since the last 30 years of his life he spent on this problem also helped me to complete my work on the unification of fundamental interactions. The crux of the matter is not in personalities. He in fact worked alone for future generations so that the theory of Superunification could be created, uniting within the framework the Einstein's unified field: gravity, electromagnetism, nuclear and electroweak forces.

And now, returning to the last article by Einstein, I felt how stressed was his mind, already an old and very lonely person. He was confident that the united field does exist but that the derived equations are difficult to understand and are unconvincing for physics. He already abandoned the concept of the constancy of the speed of light and the concepts of the inertial and non-inertial systems which he used in the special theory of relativity. The general theory of relativity (GTR) with a constant tensor curvature in the equations of four-dimensional space-time, some complicated analogues of the Poisson equations was his last hope. He did not have any other mathematical apparatus. But the curvature of space-time characterizes only gravity and does not give in any transformation the output to electromagnetism. The field theory does not '*make it possible to understand the atomistic and quantum structure of reality*'. His

consciousness could not agree with this. The mind goes round??? ‘quantization”, ‘quantum phenomena’, ‘quantum numbers’…

Now, when the quantization of Einstein space-time has been carried out in the theory of the elastic quantized medium (EQM) and the ‘quantum structure of reality’ has been understood, when it is established that the principle of relativity is the fundamental property of quantized space-time, reproaches to Einstein’s address regarding the suggestion that the theory of relativity led contemporary physics to a crisis state are unfounded. As it was noted, the present crisis has not been caused by Einstein but by contemporary physicists incapable of raising the bar of knowledge above the level established by Einstein. Only the discovery of the quanton and SEI, as the carrier of the unified field, has guided physics out of the crisis state. The time interval between ‘jumps’ in the development of fundamental science was 91 years (1905–1996). This was the period of the accumulation of new scientific facts for the next ‘jump’ of knowledge.

Then, at the beginning of the century in 1905 Einstein saved physics from a crisis, postulating the constancy of the speed of light and the independence of inertial systems on the speed of motion when only relative motion, characterized by relative intervals of length and time, determines the reality of motion of matter in the local region of space. Let us say that the constancy of the speed of light is characteristic for the local region of space during movement in it. This is the basis of STR named by Einstein the partial theory of relativity. The concept of gas-like aether dominant in physics up to that time did not allow this. However, in the experiments by Michelson and Morley the speed of light was registered as constant in the direction and across the motion of the Earth. This contradicted the concept of gas-like aether and corresponded to Einstein’s claims. At that time the simple postulation of the constancy of the speed of light was sufficient in order to remove the emerging contradictions and thus forever exclude from physics the concept of gas-like aether as not having experimental confirmation.

But already in 1904 Poincaré formulated the principle of relativity, assuming that inside a closed camera moving in a straight line as regards inertia it is not possible to measure by physical instruments the speed of the camera relative to the absolute space (this refers to the measurement instruments available at the beginning of 20th century). His conclusions were categorical: if we cannot measure the absolute speed, then absolute space and time in nature do not exist in nature. For him the space was synonymous with the void. Reality can be represented only by relative intervals of time and length in the void. Poincaré was a mathematician and as a mathematician he became accustomed to operating with small

speculative intervals, disregarding physics. Absolute space and time were introduced by Newton, but he was initially a physicist and only later a mathematician.

As the physicist, Newton allowed the presence of aether, a carrier of luminiferous medium which must be characterized by colossal elasticity. In a letter to Boyle, Newton suggests that gravity is also the reason for the pressure of the universal aether – some smallest invisible particles which fill entire space and penetrate solids. Since this could not be verified by experiments, then remaining the supporter of physics as an experimental science ('I do not invent hypotheses'), Newton did not carry out any serious studies in this direction and concentrated on the laws of motion in absolute space and time.

The tragedy of physics of the 20th century is that it did not consider the third version, when absolute space and time possess the unique properties of relativity. Poincaré and also independently mathematician Minkowski introduced, purely mathematically, the fourth time coordinate *t*, adding it to three spatial coordinates *x, y, z* on the basis of the Pythagoras quadratic formula. This was quite relevant although not accurate. Einstein attempted to find the physical sense of this mathematics, especially because this approach was in agreement with his studies. He reached the physical understanding of the unity of space-time as a continuous continuum capable of functional changes. In fact, Einstein performed the physical unification of space and time into a single substance. This was the first stage on the way to Superunification.

Einstein could not combine gravity and electromagnetism, but the first stage of the physical unification of space and time was realized by him. Mathematicians Poincare and Minkowski did not give any physical value to the fourth coordinate introduced by them and examined only the geometric parameters of coordinates. Einstein, possessing colossal physical intuition, understood already at the very beginning when he formulated the concept of the unified field, that the united four-dimensional space-time contains colossal physical sense and is the carrier of gravity and electromagnetism. Therefore he could not for 30 years study any another problem and regarded this problem as the most important. And as time showed, Einstein was right.

But then in order to give mathematical meaning to the concept of the unified field, and Einstein was not a mathematician, he rejected the formulas derived by mathematicians Poincaré and Minkowski, characterizing the metric properties of space-time by the four-dimensional interval. However, the functional possibilities of the four-dimensional interval for the analysis of the state of space-time are limited. This Einstein understood. He

required a universal function, and by varying this function, from the properties of space-time one can transfer to gravity and then to electromagnetism.

Einstein's scientific intuition again surpassed the possibilities of mathematical apparatus. It is believed that he saw the curvature of cosmic space-time as a result of the disruption of its uniformity by many moving cosmological objects. At present, it is not possible to mathematically describe the visible picture of curvature. However, it can be seen on the surface of the sphere if we take two very close apparently parallel meridian lines on the equator, and they will inevitably cross far beyond the horizon on the pole. Einstein used this approach to the non-Euclidean geometry of Lobachevsky and Riemann, to the tensors, continuously complicating and complicating mathematical apparatus, but without reaching the necessary result of the unification of gravity and electromagnetism. Geometry made it possible to connect the distortion of space-time only with gravity.

I intentionally omitted reasonings about the transformations of the Lorentz coordinates and the relativism as integral parts of the theory of relativity, since all this can be found in books. Together with Einstein, founders of relativity are Poincaré and Lorentz. To me it is important to concentrate attention on the contradictions between the categories of absolute and relative in physics as the categories of unity and of fighting the opposite. Specifically, the prevailing contradictions between the categories of the absolute and the relative influenced the fate of physics in the 20th century.

Poincaré was categorical and connected relativity only with the empty space, completely denying the Newtonian concepts of absolute space and time. Lorentz originally supported the concept of the stationary absolute aether and did not determine its structure (gas-like or electromagnetic?), and after the publication of Einstein's studies, he agreed only with his mathematical computations, attempting to resuscitate the aether concept by the effect of reductions of linear dimensions in the direction of motion. Einstein categorically disagreed with him, but was very careful in his statements with respect to the aether during his entire life: '*According to the general theory of relativity space is unthinkable without aether*'; '*To deny aether – this, in the final analysis, it means to assume that the empty space has no physical properties*' (1920) and so forth.

As is evident, the basic problems of physics of 20_{th} century concern the nature of the four-dimensional space-time. Even classics of science had the opposite opinions: from the complete negation of the structure in space (Poincaré) to the non-acceptance of empty space-time (Einstein). Einstein replaced the gas-like aether with the concept of four-dimensional space-time, completely denying the existence of empty space, and by aether he understood the medium which does not possess the properties of weighty

matter regarded as the carrier of gravity and electromagnetism. The problem was that Einstein did not visualize the weightless structure of space-time.

If space-time is the carrier of light and gravity, and light as an electromagnetic wave moves with the colossal speed, then they understood everything that the structure of space-time must possess colossal elasticity. Taking into account that the electromagnetic wave is transverse waves, the space-time must resemble a solid body since the transverse waves can be transferred only in the solid body. Thus, the structure of space-time must resemble a superhard body and possess colossal elasticity. However, this appears to contradict the common sense, since other solid bodies are not capable of movement inside the superhard body and other bodies which can be only 'frozen in' the superhard structure. I had to face this paradox of contemporary physics when I accepted the relay which led me down to the discovery of the quantum of space-time (quanton). A new stage of the quantum theory, which was full of paradoxes, started.

Discussing the above reasons which prevented Einstein from discovering the quanton, I understood that these reasons were purely methodological. Einstein conducted the first stage on the way to Superunification after combining space and time into the united substance. Then he started the unification of gravity and electromagnetism, being confident that he goes in the right direction, but nothing was obtained. The methodology of science provides for step by step motion, and if something is not obtained, then a very important stage of studies is possibly passed. So what it was that Einstein did not foresee? Today it is clear to me that the stage of the unification of electricity and magnetism into electromagnetism was passed.

It would seem that everything is clear as regards electromagnetism, except one thing – the carrier of the magnetic field has not been determined. Carriers were found for the electric charge of negative and positive polarity – elementary particles: electron, positron, proton. The carrier was not determined for the magnetic charge. It turned out that magnetism originates from the space-time through its incomprehensible topology as a result of the motion of electric charges. This was some magic. No electric charges were generally found in the electromagnetic wave of electric charges but electrical and magnetic fields were present, moreover simultaneously.

Today I regard as very naive the explanation of the reasons for propagation of the electromagnetic wave in vacuum which is erroneously connected with the laws of electromagnetic induction. It is considered that an electrical rotor forms a magnetic rotor which gives birth to a new electrical rotor in the direction of propagation of the wave, and so on. However, in experiments the formation of the electrical component in the electromagnetic wave occurs simultaneously with the appearance of the

magnetic component. This means that these components cannot consecutively produce each other since they exist simultaneously.

Analysis of the nature of the electromagnetic wave was of interest to me already in the school as a wireless enthusiast and, after all, it led me to realise the presence of the electrical and magnetic monopoles concealed in vacuum which do not possess mass and represent electrical and magnetic elementary charges. Mass-free monopoles were regarded as weightless matter, as indicated by Einstein. However, if the electric charge has its own a carrier-particle, then magnetic monopoles were not discovered experimentally. In spite of this, electrical and magnetic monopoles played the basic role during the quantization of space-time and the unification of electricity and magnetism into a single substance – electromagnetism the carrier of which is quantized space-time.

In order to isolate the elementary quantum of space as some volume, it is necessary to proceed from the rationality of nature which manages with minimum means. If it is necessary to fix a coordinate then a single point is sufficient. If it is necessary to isolate a line or a trajectory, then it is sufficient to have two points, and for the surface three points. The figure which separates the elementary volume is a tetrahedron with four points 1, 2, 3, 4 on the apices. In order to pass from the geometry to physics geometric points 1, 2, 3, 4 must be replaced with weightless particles which are planned by nature itself in the form of four monopole charges: two electrical (e_+ and e_-) and two magnetic (g_+ and g_-).

Figure 1.4 shows an electromagnetic quadrupole, not known earlier to science, which is the first stage of the unification of electrical and magnetic mater into electromagnetism.

Figure 1.5 shows how the quadrupole forms a quanton – spherical particle – the elementary space-time quantum - under the action of the forces of superstrong electromagnetic interaction (SEI). The quanton is the weightless field form of primary matter. In the quanton, the electrical and magnetic charges are connected into dipoles which cannot be split. Therefore, free magnetic charges have not been discovered experimentally. Magnetism belongs only to quantized space-time. The surplus of free electrical charges in nature is determined by the electrical asymmetry of the universe, but the presence of this asymmetry determines the presence of real matter.

Since the quanton is an elastic element, it also determines the rate of all physical processes at each point of space-time. The quanton is a real carrier and a time-setting device (electromagnetic clock) in nature (for more details see my studies of the EQM theory).

The electromagnetic quantization of space-time is the process of filling the volume with quantons.

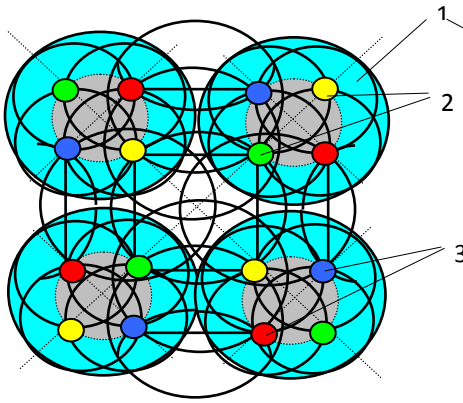

Fig. 1.23. Grid model of the quantized space-time in projection in the form of lines of force. 1) quantons; 2) electrical charges; 3) magnetic charges.

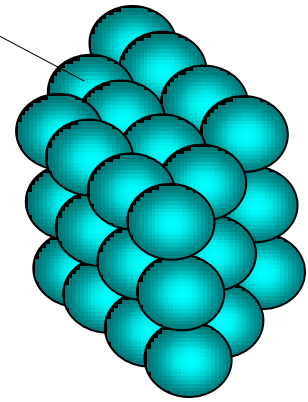

Fig. 1.24. (right) Solid-state model of quantized space-time.

Figure 1.23 shows the projection the simplified model of the local section of the quantized space-time of four quantons with the deposited grid of the lines of force of electrical and magnetic fields between the charges inside quantons and between them. This makes it possible to consider the quantized space-time as a discrete grid thrown on the entire universe which connects together all objects. The diameter of the quantons is of the order of 10_{-25} m, and their concentration is 10_{75} quantons in m_3, the density of accumulated energy is 10_{73} J/m_3. If we activate one cubic meter of vacuum, this is equivalent to the birth of another universe as a result of a Big Bang. The quantized space-time is the carrier of superstrong electromagnetic interaction (SEI) – Einstein's unified field.

In Fig. 1.24 (Fig. 1.3) the quantized space-time is represented in an even simpler form as a discrete close-packed structure of quantons in the form of spheres. This structure resembles the solid-state structure (charges inside quantons are not shown on the solid-state model).

The grid and solid-state elastic models of the quantized space-time are equivalent to each other. The grid model is convenient for studying electromagnetic wave processes, and the solid-state model for studying gravity. In the equilibrium state the charges with the opposite sign inside the quanton opposite are symmetrically balanced, presenting the quantized medium as neutral. I have omitted the moments of disruption of the electromagnetic equilibrium of the quantized space-time which are described in my works.

Let us examine the fundamentals of gravity which start with the

phenomenon of formation of mass in elementary particles. Mass is a gravitational charge. It is gratifying that the nature of gravity completely coincides with Einstein's concept of distorted space-time. For the sake of clarity, the solid-state model in Fig. 1.24 is regarded as a cube of elastic sponge which consists of very small elastic quantons. I have already mentioned that the three-dimensional distortion of space-time is difficult to imagine. But this model makes this possible. Inside the elastic sponge we hypothetically separate a small spherical region and start to compress it evenly on all sides together with the quantons inside the sphere. It is obvious that with compression inside, on the outer side of the sphere the sponge will be stretched and the nearer to the sphere the stronger this extension is.

From the geometrical viewpoint, we can discuss a change in the topology of the space whose description is represented by many Lobachevsky's spheres with different curvature, placed as a Russian doll (matrioshka) inside each other. This approach leads to the serious complication of mathematical apparatus and to departure from the physics of the phenomenon. I acted as a physicist, abandoned the geometry of distorted space-time, and introduced a new unit of measurement – the quantum density of the medium which characterizes the concentration of the quantons per unit volume of space-time. This is the basis of the new quantum theory of gravity, whose mathematical description has become possible within the framework of the classic field theory.

I would like to mention that Einstein did not accept the statistical nature of the wave function – the basis of mathematical description in quantum theory. The introduction of the quantum density of the medium has returned the deterministic nature to the quantum theory. The spherical deformation of sponge, examined above, in transfer to the quantized space-time, causes that the quantum density inside the compressed sphere increases due to its decrease on the outer side. In the field theory, this process is called as the divergence of the gradient of the quantum density of the medium and is described by Poisson's equation which describes gravity. The two-component solution of Poisson's equation was thus obtained for the first time when the tension of medium (its distortion according to Einstein) is balanced by its compression.

It turns out that gravity is manifested as a result of the spherical deformation of the quantized space-time, and the sphere of final compression is the gravitational boundary which divides the regions of compression and tension of the quantized medium and which balance each other. For the elementary particle the process of the spherical deformation of the quantized space-time leads to the formation of mass in the particle, which is equivalent to the energy of elastic deformation of medium, only it is expressed in other

measurement units. The release of the energy of elastic deformation of medium in wave photon emission is determined as the mass defect of elementary particles.

In order to form a gravitational boundary, it is necessary to have a certain surplus of free electrical monopoles not connected in quantons. This is determined by the electrical asymmetry of the universe. In nucleons, the gravitational boundary is formed in the form of an alternating shell, collected from several tens of electrical monopoles with the alternation of the polarity of the positive and negative charges which ensure the effect of compression of shell and the medium in formation of the nucleon mass. At the same time, this enables the alternating shells of nucleons inside the atomic nucleus to be mutually attracted by the electrical attraction forces of monopoles, regardless of the presence of the unbalanced charge of positive polarity in the protons. Thus, nuclear forces in the theory of Superunification are reduced to the forces of the electrical attraction of the alternating shells of nucleons. The electron does not have a clearly expressed gravitational boundary, since the weak effect of the spherical deformation of the quantized medium is produced by a single central electrical monopole charge. Therefore, the mass of the electron is considerably smaller, almost ~1800 times, than the mass of the nucleon. Thus, a study of the structure of elementary particles inside the quantized space-time made it possible to combine gravity and electromagnetism, considering gravity as a secondary formation.

Once Einstein described mass as the measure of inertness and gravity by the curvature of space-time. Now it is possible to refine the concept of mass as a measure of the elastic spherical deformation of the quantized space-time. In a popular publication I intentionally did not present any equations, despite the fact that the described complex processes can be described relatively simply in the field theory. It was important for me to show the physical essence of the generation of mass as the basis of gravity. When these unique scientific results were obtained, I was in a state of shock since the mass, as I was taught, does not exist in nature. It turns out that mass is the cluster of energy of the spherical deformation of the quantized space-time and not more. Therefore, an increase in the speed of a particle increases the energy of elastic deformation of the quantized medium and respectively the particle mass. Real matter is the integral and indissoluble part of the quantized space-time.

However, precisely this phenomenon of mass could explain the motion of one solid body inside the super-solid body as wave energy transfer. It turns out that the elementary particle, for example a nucleon, moves in space as a single wave, as some soliton, via the transfer of the spherical deformation of the medium (i.e., the nucleon mass) and monopole (mass-free) charges in the alternating shell of the nucleon. Only this explains the corpuscular-wave

duality of elementary particles in quantum theory when the particle simultaneously shows wave and corpuscular properties.

However, most importantly, it was possible to establish that during movement of the particle in the entire speed range, including light, its gravitational field and form remain spherical. This made it possible to formulate the principle of spherical invariance, extending it to other bodies which consist, in the final analysis, of a set of elementary particles. In accordance with the principle of spherical invariance, the speed of light on the Earth's surface in the local region of space remains identical with respect to directions in the entire speed range. This was experimentally observed in the experiments of Michaelson and Morley. It was established that the principle of relativity is the fundamental property of the quantized space-time. This made it possible to formulate a new fundamental principle of the relative-absolute dualism.

The properties of the quantized space-time as weightless matter do not have any analogues with the known material media: solid, liquid, gaseous. Possessing superhard and superelastic properties, the quantized space-time is characterized by superpermeability, freely making possible for real matter to penetrate without friction through the quantized medium. Light, as the wave motion of photons, also freely propagates in the quantized medium. Outwardly this enables us to perceive the quantized space-time as a void. The quantized space-time reacts by force only on the acceleration of the particle and the body. This fact was established already by Newton. Now this fact has theoretical explanation. No real medium possesses such unique properties.

To complete the analysis of the posthumous Einstein's article, I have come to a conclusion that he in vain, probably due to desperation and fatigue, forewent his scientific heritage, since his ideas work wonderfully inside the quantized space-time. Simply, one human life was not sufficient to solve such a global issue. Nevertheless, he had time to indicate the direction towards the quantisation of space-time on the way to the unification of quantum theory and the theory of relativity. Einstein accepted only the deterministic nature of quantum theory, and he was confident that the problems of quantum theory lie inside the space-time.