

# METRIC THEORY

Ury Kofman

## Abstract

Simple, very natural, spatial (three-dimensional) function of ether density is — according to suggesting theory — the only one primary essence of Nature; this function creates something like unified wave system.

Globally — capturing the creation at whole — this system produces infinite pyramid of nested black holes. Every such black hole is a certain volume "on some level", consisting of both its own black holes and its own ether. Our universe is a photon (black hole) of elder universe, and our ether is part of this black hole. Photon in our universe is a black hole and self-universe like ours. Periodically arising "problems" of heat death and gravitational collapse are resolved by Big Bangs (on every hemicycle of photon motion).

Locally — considering our universe — unified wave system produces observing by us secondary essences: matter, motion, gravitation, electromagnetism, strong interactions, phenomena of uncertainty and relativity. The theory considers ways and mechanisms of production and functionality of main physical essences of universe. Little more attention is paid to nature of gravity and wave-particle nature of matter — for elimination of existing logical contradictions and misunderstandings; theory supports "gateways of junction" between formal logic and quantum mechanics.

Considering of essences has neither mathematical nor philosophical, but conceptual-physical form. Modern physics suffocates from essences, and this theory is consistent implementation of Occam's razor.

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**E-mail:** koff\_m@mail.ru

` — and that shows that there are three hundred and sixty-four days when you might get un-birthday presents — '

`Certainly,' said Alice.

`And only one for birthday presents, you know. There's glory for you!'

`I don't know what you mean by "glory,'" Alice said.

Humpty Dumpty smiled contemptuously. `Of course you don't — till I tell you. I meant "there's a nice knock-down argument for you!"'

L. Carroll "Through the looking glass —"

## Introduction

The present theory describes the physical basis of the creation. What is commonly called "the unified field theory."

At foundation: space is not emptiness, but medium; matter is also part of medium, "compressed" medium.

Before just theory – cosmological consequence, which will be often used by me in subsequent elucidations.

Every photon in universe is a self-universe like our. Whose lifetime (from Big Bang to collapse) is the hemicycle of photon's wave motion. Our universe is also photon (judging by universe's structure and fantastic youth, it can be taken as working hypothesis), but belonged to elder universe like our photon belongs to our universe. This pyramid is infinite to all directions — upwards, downwards, across. Also it can be said so: any universe is some volume in infinite three-dimensional space; and in any volume — endless count of universes. There are universes even in the volume of vacuum, but maybe it needs "going down step" to discover them.

### **Metric function**

Let's turn to description of just theory.

Take infinite three-dimensional Euclidean space. Let's determine the map (function) of a quantity, which can be described — as velocity of propagated interactions, imagined — as space density, but I'll call "metric of space". Metric cannot be defined in a point, because point is pure mathematical concept; metric can be defined in any (arbitrarily small or large) volume (I imply sphere always). Metric and space are not quantized but infinitely divisible (space) and refined (metric).

Define the unit of metric measure and the unit of length (distance) so, that metric of any unit sphere can be considered as unified. We got the snapshot of Nature (space + metric) with some (arbitrarily deep) resolution.

Dynamics. The metric spreads, equalizing levels, from high values to low with a velocity equal to the metric value in the low metric zone. (It is formal description, the actual implementation goes through the longitudinal wave, and sometimes high value areas maintain their level from the inside.)

No one any more primary entity in Nature exists. No one in this case means no one. Time, matter, energy, fields, interactions — all of these are the entities raised by space, metric and dynamics of its propagation in space; and space — in a certain sense — is a property of metric. There is no space out of metric, space is Euclidean, further it will be clearer, that saying about curved space, we are saying about gradient of metric of the region (volume).

### **Time**

Formally — distance-to-metric ratio, and time unit is a time required to high metric for passing unit distance of unit metric space. In fact, time interval (unit) is determined by the "life speed" of the macro-objects in observer's reference system. For example, for a unit of actual time, you can take the cycle time of an electron around a proton in a hydrogen atom.

The concepts of simultaneity of events, past, present, future exist objectively and do not depend on the characteristics of the observer.

### **Unpredictability of future and irreversibility of time**

The selected resolution of Nature's snapshot implies that the observer is not able to view deeper (with shorter distances) metric levels. Therefore, the observer cannot have an idea of metric values (and their dynamics) below the selected resolution, and accordingly cannot predict future events at his level, as these events are spawning of previous levels. Starting from the selected resolution, analytical predictability rises sharply, but also never reaches unity. Naturally, metric dynamics is irreversible because reversibility requires restore an infinite number of infinitely deep levels.

## **Entropy**

A keystone for understanding the whole theory.

Mentally fix high metric sphere in a low metric space. Metric difference will propagate, weakening as it spreads to the outer layer of the expanding sphere. A low metric will never pass to high. Heat death, entropy.

But the point is that sphere itself generates a metric. It has zones of high and low metric (relative to the sphere metric), which create the sphere metric. And in these zones there are subzones, and in subzones — subsubzones. It may be clearer, if we'll say that the metric of the sphere is created by the movement of high metric zones (and in a certain sense, this is indeed so), and in each of zones — both high and low metric — their own subzones of movement, and in these subzones — their movement. And so ad infinitum. Only by contraposing the infinities to infinities, we get homeostasis.

Take a stable elementary particle, for example, photon. Pure perpetuum mobile. It works all his life, spends energy, and never gets tired. Because the photon is a zone generating more metric than the surrounding it space. Photon partially transforms a space-excessive metric into what we call energy, and gives it to space. As if heating up. But ours universe is the zone (let be also a photon) of the elder universe, and gives it energy exactly the same way. That is, the staircase lead upward in the same way as downward. Also to infinity.

On a philosophical level, it's better to imagine the metric staircase as a staircase of movements, on the physical — as a staircase of densities, in some cases of temperatures. But the essence is one, I call it "metric".

A little more philosophy. Infinities are alien to the human mind, and explanations of physical phenomena and structures through infinity are often perceived as math games of the mind. But Nature does not care about our mental habits and preferences. All sorts of quantizations, that not accepted as decisions of specific (possibly still unknown) equations and finding eigenvalues, but erected into a system of postulating physical fundamentals — are conceptually flawed. You can't say this about infinities anyway. Well, in addition, the theory of metric maintains a line of ideas about the center of the creation: first Land, then Earth, then Sun, then Universe, and here now the Staircase. And finally, to put it mildly, not a weak reduction in the fundamental physical entities; physics — forced or not forced — but forgot Occam's razor, not a sin to recall: entities must not be multiplied beyond necessity.

## **Mechanism of wave propagation of the metric**

The metric is propagated by a longitudinal wave. When the high metric goes to low metric area it moves slowly due to the low metricity of the medium. But "back" elements move quickly, since their medium is highly metric. As a result, the amplitude front is sharply high, almost sheer. And behind the crest of the wave (which torn off from the parent) there is a smoothly descending slope. This geometry can be fully explained only after consideration of movement mechanism — slightly lower.

## **Matter**

Any volume of space generates metric. However let's call the "metric generator" — the sphere volume permanently generating a higher level metric than the surrounding space. A simple elementary particle — sphere region of high metric, which, firstly, is able to move in space with the velocity of propagated interactions, and secondly, it is a metric black hole, i.e. it doesn't release out metric generators of its level — from its volume. If easier, so as not to confused in definitions, simple elementary particles are photons and neutrinos. They have a sufficiently high density and close relationships between elements of the internal structure — to enter into relationship with the universe as a single object which does not have an internal

structure. Simple particle generates metric disturbances in the surrounding space and moves on the crest of the self-generated disturbance — because always striving for the highest level of metric in the environment, and low metric of the medium inhibits the disturbance, and internal regions of simple particles move in hot space faster than disturbances in cold.

Cohesive particles have a certain way and to a certain extent deterministic structure. In a first approximation, we shall consider simple particles as the elements of this structures (the meson in proton is not a simple particle, however, "going down one or two stairs" in the structure of proton, we still come to simple particles; by the way, stairs can be unviable as autonomous cohesive particles). Exactly these structural elements — simple particles — generate a total metric of cohesive particle. Although stable cohesive particles do not release their metric generators in simple particles, they are not in the strict sense metric black holes because they support stability not only due to the high density (more precisely, the metric gradient), but also due to structure, in violation of which a cohesive particle decays. Concept of structures in this case includes metric disturbances generated by the movement of structural elements, and the cyclic recurrence of elements movement.

Metric of cohesive particles is much lower than the metric of simple particles. All simple particles (in the cohesive composition) move curved (ring) routes inside the cohesive particle with speeds greater than the velocity of propagated interactions in outer space — because metric of cohesive particles, although lower than the metric of simple particles, but higher than the metric of external environment. For a cohesive particle, bridges of increased metric between structural elements are characteristic: although disturbances generated by motion entail element outward, adjacent to the bridge areas of the element do not want to tear themselves away — from metric of the bridge, while internal connections of the element are stronger than those and these forces.

Simple and cohesive elementary particles, as well as larger objects, generated by elementary particles and metric connections between them, let's call matter. And material is matter, which is not a simple particle in free state.

### **Mass and density**

From the foregoing it follows that in terms of metric theory, the metric mass of a certain volume (for example, particle) is the total power of the metric generators in this volume, more precisely, the quantity of metric generated by the volume for time unit. A more precise definition takes into account what we call binding energy, increased metric within the volume. Mass is the same, but minus a unity-level of this volume — so that this the characteristic could be counted from zero and added. Unity-level of a metric is natural for us to define as a metric of cosmic space. Density — hypostasis of the metric, it can not be counted from zero, it taken by a coefficient from unity. Nevertheless, we call this density metric density, and density — metric density minus one. Mass — the characteristic is narrower, it is considered only for matter, but not for the wave. But in calculations with the mass, you can not take into account the volume, which is convenient. But in complex calculations, in subatomic physics, for example, it is preferable to use metric or metric density. As Dirac showed, one can consider even theoretical cases with a metric density of less than unity.

Formally — so, but hereinafter references to density will be understood as density characteristic — the cubic root of metric density — for just it is the hypostasis of metric.

### **Metric**

It is necessary to clarify what is meant by the metric.

A metric is some generalizing characteristic of a region of space. The value of the function, the velocity of propagation of interactions, the density, the temperature of ether, the speed of life at rest — these are all equivalents of this characteristic — metric. When considering a

metric wave, it's convenient talk about the density of ether, gravity — about the temperature of ether, processes in systems — about the speed of life, interactions of objects — about the velocity of propagation interactions. All these equivalents are dependent, they all refer to the metric. Mathematics will come later, but for now, these are linearly dependent quantities, even more than that, there are just the same thing.

In the narrow sense — when we talk about a point in space — a metric is understood metric of ether elements.

Each area has two characteristics: a metric scalar and a vector of metric gradient.

### **Metric gradient**

The gradient of the metric, as the name implies, is determined by the metric change, the first derivative of the metric function. Metric gradient is a vector aimed at the highest metric characteristic.

Any object — and above all, of course, a metric generator — moves by metric gradient vector. It is quite difficult to explain without tautology, but intuitively, I think, it's clear: the generator itself is strongly connected set of waves that propagates more easily and quickly in space of a higher metric, which leads to a shift of "metric gravity center". Or, for example, like this: suppose that in the volume of space with a fixed metric gradient (let's call it an external gradient) there is a cohesive object consisting of a center and two identical metric generators scattering from the center in opposite directions: along the external gradient and against it. Center forms internal gradient. The external gradient will enhance the internal relatively receding (against the vector) generator and weaken relatively approaching. As a result, the center will begin to shift along vector of the external gradient (not taking into account that the center itself, of course, will experience "gradient pressure").

The denser the volume (relative to the surrounding space), the higher the metric gradient at its borders, the harder the metric generator leaves this volume. So an astronomical black hole will hold a photon, though not a neutrino. However, the density of the "holding volume" has the meaning only at a short distance, slightly exceeding distance from center to the "last" metric generators. And then only "gravitational parameters" remain in the game — mass and distance to the "held object". The metric gradient of our universe holds every metric generator of its (universe) structure, although, strictly speaking, such statements require knowing metric of the elder universe.

In a sense, attracting an astronomical analogy here is not so good, because — for astronomical objects — gravity is much more important. Gravity is also a manifestation of the metric gradient, however specific, and will be considered separately. The analogy is left for in order to make it clear that when considering large objects, which density approaches the density of a cohesive particle, a new not too clear power appears.

But real manifestations of metric gradient will be for consideration of structures in the nuclear space. Gravitational forces there can be considered no, but the forces generated by the gradient changing between neighboring areas become determinative. The reader is supposed to draw invisible parallel between what is stated and today's ideas of theoretical physics. And immediately find this parallel in the case of a metric gradient can be not so easy. In astronomy, this is a curvature of space, while in subatomic physics — firstly, strong interactions, and secondly, fields and forces, supported by different virtual particles (that's really — virtual, how dodgy modern theoretical thought is, advocates the cosmogonies of Ptolemy at the Newton's time would have died with envy). None of these parallel entities are as independent entities. But there is impossibility (or insufficient energy) to leave the high metric area. Figuratively speaking, the intranuclear gradient of the metric is the same gravity with  $R$  less than unity and densities instead of masses (but only figuratively).

### **Rectilinear uniform (inertial) motion**

Suppose that macroobject, e.g. cohesive particle or star, moves in isometric space with velocity considerable lower than velocity of propagated interactions. During the motion, object emits spherical metric wave. Because of the object's motion, straight directed metric will be higher than opposite directed metric (as analogue, it can be conceived subsonic plane that produces sound wave; sonic density before the prow will be higher than behind the tail). Therefore, it's created vector of "internal" metric gradient, and object will move directed this vector, and this motion supports motion because new displacement will create gradient again (in our analogue it needs to conceive that plane movement is determined by sonic density difference). Thus once gathered speed determines further inertial motion.

The physical and mathematical scheme of inertial motion will be lopsided emitting a metric: object emits half metric inward direct circular cone with a cone's generator obtained by the Lorentz formula. It's full motion equivalent for objects larger than ether elements: inertial motion just is such emission of metric; cone, degenerated into half-space, is a state of rest.

### **Accelerated motion**

Now fix our object in field of constant external metric gradient. Let's take away fixation. Object will begin shifting directed external gradient vector, this "shifting" creates internal gradient and, by the way, it's independent of object's mass. If we take away external gradient now, then our object will continue inertial motion according to "formed" internal gradient. But while external gradient exists, it "speeds up" internal. Let's call vector of internal metric gradient as vector of velocity (scalar — as velocity); vector of external metric gradient as vector of acceleration (scalar — as acceleration). I note here, that described motion is relatively uniform accelerated — for velocities which are incomparable with velocity of propagated interactions. In movement — both accelerated and inertial — relativistic effects occur due to the fact that structural elements are subject to metric restrictions on spread in a certain direction. This question will be in more detail considered in theme "wave properties of material." In the meantime: Lorentz's equations for accelerated motion are true.

### **Wave**

The wave is quite well learned appearance, and the whole theory — from Huygens — is fit for metric wave. Earthquake is a good analogue, because metric is exactly the density of space. The medium of metric wave is ether: wave is a push, elements of ether transfer momentum mechanically, stumbling one each other. When passing waves, ether elements acquire a metric gradient, but are not able to go far. The macroobject that currently consists of these ether elements gains movement — receiving a push from the wave. And glides over the elements, replacing them with new ones, and also with a gradient (this slip explains the absence of the ether wind). If macroobject is not a simple particle, then the wave velocity is higher, and the wave leaves the macro object. But the object has already received momentum movement — in the direction of wave propagation.

A wave can be considered from two positions — as a density wave and as a wave of metric gradient. For a basic view, better consider a density wave, each point (small neighborhood) which also has a gradient characteristic. It is not harmonious oscillation: high front generated by braking of a low-metric medium spreading, and lowering slope. The wave is longitudinal, it is possible to imagine moving forward dish, followed by train. This train (it's more usual to say "slope") is obtained as usual for a metric gradient: ether "reaches" high metric, creating an area of gradually increasing density. And the front, and the slope carries a forward metric gradient, but the front is limited only by the medium, the front spherically expands, lowering the crest (amplitude). Each element of moving slope is rigidly determined: it has density less than the leading element in front, and accordingly less emits metric. But the metric is emitted

unevenly: this element throws forward as many metric as the "forward element" throws back. If it will throw more (which happens, for example, when waves overlay), then the crest will grow, if suddenly less, then the crest will fall "by internal reasons". You should also keep in mind that metric is not only density, but also the velocity of propagation of interactions. And another interesting circumstance is that the wave itself, being high-metric object generates a metric.

This is a description of an ideal metric wave. But of course you must not imagine that in collision of two structured objects, metric wave of the moving object has a direct effect on the resting one. Collision is implemented through several elements of the structures of objects. Then the bridges of internal relationships are pulled, and the objects set in motion, striving to maintain the integrity of their structures. The energy of uneven metric emission transfers into the energy of supporting internal connections naturally. From here it's sprung the law of momentum conservation. The law of conservation energy turns out to be somewhat less precise: if objects (elementary particles) fly apart in different directions, then in the continuation of the first object movement (before clash) there are metric disturbances too.

We considered the density wave as the primary principle. But the wave itself density rarely interests us, in very specific cases — such as the birth of matter. This case will be considered, but later. Usually, more practical interest is the total gradient of the metric. Means acceleration. Means energy.

Velocity of propagation is always metric of space, ether elements usually have only oscillatory motion (usually — because inhomogeneous). When we are saying about macroobject's velocity different from velocity of propagated interactions, we are saying about velocity of system of wave generators, this system does is macroobject; velocity of each wave is determined by metric. Wave carries absolute level of metric, "no difference" for it — in certain sense — what environment metric it goes ("difference is" for velocity); if it hypothetically imagined a wave in a pipe, then from the far end of the pipe, the wave will come out with the same metric as it entered, regardless of the metric inside the pipe. After passing the wave, the metric of the medium will remain the same as before passing.

Metric waves are produced by metric disturbance of high metric objects motions, these objects-generators are wave systems, indeed; in general, metric theory gives possibility to understand physical essence of the waves, their fundamental level, to solve philosophically discussion about long- and short-range interactions. Short-range interaction wins, and even without carriers of fields.

Let's consider that object, which inertially moves in isometric space, suddenly "flies into" space of fixed metric gradient, directed opposite to momentum vector of object. I'll call that environment "ideal elastic obstacle". Obviously, object will begin braking "up to stop", and then will accelerated move "up to exit" from obstacle. "Given" momentum, time and velocity during braking are scalarly equal to "taken" momentum, time and velocity during speed-up. Analogous supposition may be done for object "flying into" zone of ideal elastic obstacle at an angle, and "angle of reflection will be equal to angle of incidence".

### **Ether**

From the point of view of observer, who looks on the processes of our universe, ether is field of "flat" — maybe little changing — metric, environment for propagation of metric waves. Nevertheless, metric of any place can't be "quite flat", and with "quite high" resolution of metric snapshot we'll get metric "peaks and plateaux" for any and arbitrary small volume of space. These deviations will have the same nature and character as on bigger snapshots of "our" objects with less resolution. I even permit myself to speak more emotional-mathematical: take any spherical volume of space. Suppose it has metric  $m$ . For any (arbitrary) high metric  $M$  ( $>m$ ), it exists in taken volume such sub-volume that metric of this sub-volume will be higher than  $M$ . But volume integral is finite. That is, within our universe,

the "junior" universes are not only laid in simple particles, but also on the ether.

Matter generates only a certain part of the metric (density), a large part is generated by the ether itself.

The ether does not resist and does not create winds; moving objects, being systems of waves, do not retain their etheric components, but completely renew them during movement — ether elements flow through the object, temporarily being its building material.

The ether is motionless, at least "our ether" for our universe, and preferential reference system (with the slowest passage of time) — exists, this is the system in which the observer "stands on one set" of ether elements.

### **The birth of matter**

Imagine three metric waves converging in one small volume. Their intersection will be mathematically a point, and physically — a small neighborhood. With high density. The waves move, and the point runs, "sweeping the space". The waves, dropping, die. And the point, if its density exceeded some threshold value (thermal photon density) becomes a simple particle. And if, say, upon impact of a well-accelerated stream of elementary particles with the similar stream, "in the etheric sea it's a metric storm", then born simple particles catching on each other will also give rise to cohesive ones.

So — from the intersection of waves — the matter of our universe was born after the Big Bang.

### **Gravity**

The most fundamental power of homeostasis. Without electromagnetism there would be no atoms, without short metric bridges there would be no cohesive elementary particles, but gravity is even deeper, without gravity there would be no Staircase.

The essence is clear: the area of high metric on the one hand cannot decay, each element is attracted by a high metric of area, and on the other — it pours generated metric into low-metric space.

However, the question arises: if at regular intervals a high metric pours the same amount of metric into low-metric space, why, considering spherical expansion, the level of "incremental" metric decreases proportional to the distance, not the square of the distance? And metric gradient (= acceleration = gravity) is proportional to the square, not the cube of distance?

The answer is that the theory of metric conducts its calculations in Euclidean space, and we are — in equal-density. That is, we stretch, multiply the Euclid-distance by metric, and call this value the distance. In some ways it's more convenient, but — as minus — we work in a curved space. Hence the relative validity of Einstein's postulate of the constancy of the light velocity — when considering astronomical objects in equal-density space. When do we go to subatomic physics, it is no longer possible to picture equal-density space.

In Euclidean space, the calculation of gravity is a little more complicated. Thing is that if we cut the divergent metric into layers along the small  $\delta-t$ , then the back (near to the center) boundary of the layer always goes a little faster than the front, that is, the thickness of layers with distance from the center is reduced (in proportion to the cube of the distance). But then we work in Euclidean space, each point here has a scalar characteristic of metric and vector characteristic of metric gradient.

On the example of gravity, the significance of the difference between mathematical estimates in equal-density curved and metric Euclidean spaces is clearly visible. One should always remember this difference, no matter what calculations are making.

It is worth recalling the paradox associated with the binding of gravitational center of the Earth to its spatial center.

Astronomical observations allow us to speak with confidence about compliance with the



principle of superposition for gravitational fields. That is, every field acts on the object regardless of the existence of other fields; eventually the resulting vector affects the behavior of the object. But if we try to transfer the principle of superposition to Earth, considering each atom as an independent source of gravity, then we come to a contradiction with established coincidence of the gravitational and spatial center. Because the gravitational force of influence of each atom decreases proportionally not the distance, but the square of the distance. From here, firstly, the gravitational center of the earth for a certain object will be located much closer to surface and the numerical value of gravitational forces will be different, and secondly, gravitational "pressure" on an object — when its height changes above (below) the surface of the Earth — will change much more dramatically, than established empirically. For modern theory, the problem is insoluble. If we forget about metric theory, then to explain, it is simply necessary to introduce into space some kind of emanation decreasing in proportion to distance; this volens-nolens turns emptiness into something with some physical characteristics, that is, ether. And another entity — generating emanation — is needed introduce into all elementary particles. And this is a preparation for the theory of metric. Well, actually, modern attempts to explain gravity do something like this.

In the metric theory, this paradox ceases to be a paradox.

When considering gravity, the question inevitably arises: is it true, that a simple elementary particle, once in the zone of increased metric, will generate the same amount of metric as before hit? There will be changed environmental characteristics, in a sense the speed of life will change. Not going into long discussions about: yes, everything will be preserved. Here we can consider the metric not even as a characteristic of density, but as ether temperature. If we lower the metal ball — which heats up from inside — into a pan with hot water, then the total heat transfer of the system (pan + ball) will not change.

A higher level of metric in the center of the Earth means, in particular, that a mechanical clock in the center of the earth will go faster than a clock in space, outside the scope of the noticeable influence of Earth's gravity. Sorry, check of this statement, placing one watch in the basement of a skyscraper, and other on its roof, is impossible: this watch will be affected by different (generated by Earth's gravity) metric gradients. External gradient applied to an object will slow down the subjective time of a macro object (to problems traditionally related to the theory of relativity we shall soon turn to).

Faster, but not much faster, the metric of the Earth's center is very slightly different from space metric; for an observer in an elder universe the ratio of the mass of the Earth to the mass of the same volume of "our" cosmos is not much more than unity.

### **Theory of relativity**

The theory of relativity does not play any significant role in the concept of metric theory. But since reader's perception of the physics of the universe goes through the prism of the relativity theory, I just have to give a fight in this territory.

In the theory of relativity, everything is theoretically incorrect, but it gives good practical and formulaic conclusions. It is also elegant. A jab must be done to the heart, to the postulate of the invariance of inertial reference systems. But unlike numerous (and de facto had lost) critics, I shall not prove the existence of contradictions in the category of time. Critics were right, but time is a slippery concept. I shall show that on a purely physical level one can see and understand whether the system is at rest or at rectilinear uniform motion.

Perform — according to tradition — gedanken experiment. For preparation we take photon source and its absorber. Along the trajectory we pull a special photographic paper capable to register every burst of electromagnetic wave generated by the photon passing near the strip. Theoretically (we set thought experiment) such a strip can be created. In addition, no one bothers instead of a single photon, use a wave packet, lasers and masers. I shall say "photon". We emit and catch photon, and count the number of marks on paper. By the piece. Now we

repeat the experiment with a photon with moving along the motion paper. As toward the movement of photon, and backward. The distance between the marks will be vary, but the number of marks on paper will remain the same. Now put our installation on a spaceship, launch it from the Earth and gain on ship decent speed. Stop the engines. Start up photon along the axis of the stern — bow. Count marks. Turn installation in the opposite direction, launch photon along the axis "bow - stern". Count marks. Question: will the counts coincide?

According to the postulate — yes, they will coincide, we even complied with the initial Einstein's conditions, although they don't really interest us, we are interested in whether the ship is moving or not; if yes — at what speed.

And now we take the position of the earth observer, whom we shall consider motionless (whatever that means). For him, the photon in the direction of motion goes a greater distance than against the course. In addition, there is longitudinal Doppler effect, which does not compensate, but will increase the gap in marks. Indeed, if we assume that the emitter emits "green" (the green part of the spectrum) light quantum, then for the earth observer "blue" photon at greater distance will make more marks than a "yellow" at a smaller distance ("green" becomes "blue" if the direction of motion of ship and photon co-directed; "yellow" — if they are opposite; for the observer at the ship, due to its own speed, all photons are "green"; by the way we can replace the second photon with the reflected one using a simple system of mirrors). In order for the number of marks to coincide, something like "Doppler anti-effect" is required, that, of course, is not serious.

But "mark counts" of both observes will be the same, because marks are counted by pieces, and neither Lorenz coefficient nor reasoning about the uncertainty of time intervals, will help. The objection that paper will resist is also not passes: we fix neither the distance to the paper, nor the photon energy — we are only interested with the facts of splashes.

The contradiction is insoluble. The number of marks in the second experiment will be less. The postulate is incorrect. We determined not only the fact of movement, but also the speed of the ship — relative to the ether — along one of the spatial axes. And there are exist such speed and direction of the ship at which the number of marks at any turn of the installation will coincide: it will be motionless, predominant reference system. Time in it will flow faster than in all other inertial systems.

The experiment does not involve metric theory; from its (theory) point of view there will be one funny effect: the leakage of photons will begin. The weakest thermal photons will begin to dissolve in the ether when moving against the ship, and the hardest gamma radiation when emitted along the way will turn into a neutrinos. As a side effect of Doppler. But about photons and neutrinos — later.

I decided that one experience is not enough. We put the second, maybe not so clean, but technically more important, thought experiment. On the same continuing flight spaceship.

We introduce the concept of photon clock. This is a clock that ticks when a photon covers distance to the mirror and back. Again a mirror — and a new tick. Where "directed clock" — it doesn't matter, Michelson and Morley convincingly had showed us this. And for observer on the ship, and for earth observer, such clock is completely satisfied: it measures equal intervals of time. And now we place over the motionless hydrogen atom (relatively observer on a ship, of course) a camera that photoes a hydrogen atom at every tick. So for each cycle of rotation of an electron around a proton lots of photos are piling up. Let's agree to call "lower point" the farthest point from which the electron is located against the course of the ship, and "top point" is the most distant along the way. Take a pack of photos, say, for one cycle, and begin to watch them in pairs. First and second, second and third, etc. We look at each pair, the electron has moved from bottom to top, or from top to bottom. And put off, respectively, the photo in one of two stacks. The question is: at the end of the calculation, stacks will be equal thickness? Or different?

According to the postulate — equal, there's no a word to say contra, this is no longer playing

with photons, this is the foundation of the basics. Moreover, the electron paths are from bottom up and from top down should be very similar. (Do not forget that the pictures were taken by the moving apparatus, the movement of the ship on them is not visible). Photos must be accurate same as on Earth.

But now let's look from the position of a motionless observer. For the purity of thought, let's drop sharply complicating technical aspects: the spatial complexity of the trajectory, quantization of velocities, Rydberg orbits, Heisenberg uncertainties ... we shall assume that the electron rotates in the plane from bottom to top and from top to bottom. We assume that the greater the projection of electron speed on the axis of motion — the higher real electron velocity (that's so even mathematically — for speeds of system not less than the "natural" electron velocity). And what do we get?

At the upper and lower points, the projection of electron velocities on the axis of motion coincides with the speed of the system and proton (zero at rest). On the way down the projection of velocity will decrease until the intersection of the plane perpendicular motion vector and passing through a proton. Then will increase up to the bottom point. That is, the speed of electron movement will be always lower than the speed of system movement. On the way from bottom to top, the projection of speed will increase up to intersection of the same plane and then will decrease up to the top point. That is, electron speed will be always higher than the system speed. Therefore speed of electron motion on the bottom-up path will be constantly higher than the top-down velocity. This means that the Lorentzian decrease of own speed along the "up" path will always be greater. To illustrate, we can imagine the case when the speed of the system is higher than the difference between light velocity and the "natural" speed of an electron. How does an electron can travel "bottom-up" during the same time on a photon clock as "top-down"? Only by change of the trajectory. There is, however, one subtle point. May be it is worth taking into account own slowdown in the life speed on the electron. A moot point, maybe yes, maybe no. But as with the Doppler effect in the first thought experiment, this slowdown — if it is — only will delay the time of "rise" of the electron to the upper point.

So, the symmetry of the electron path up and path down will not be observed either by time or by trajectory. Personally, I think both in that and in another, but this is a private opinion. However, in any case, in the photographs we shall see symmetry violation. In general, any rotation process not in a plane perpendicular direction of movement (or perhaps just any; more on that below), which analyzed with the snapshots, will show both the fact and the quantitative parameters of uniform rectilinear motion.

I considered it's legal to throw out the electromagnetic fields from consideration. Someone will not agree. Good. Take the children's railway ring (put it on the table on the ship) and a fixed-speed train giving "on Earth" speed of 2200 km/sec. Let's run it. And take pictures, take pictures, not trust nothing but photos. For invariance, a number of symmetries must be observed.

Okay. This is for illustrations. The ideological refutation of the postulate of the invariance of inertial systems is the first experiment. And just so they should be considered. But actually, I'll risk assuming that if "the incomparable" sways, then physicists will find a lot of ways to determine whether we are at rest or in uniform rectilinear motion: and in the wave properties of material, and in electromagnetism, and in the photoelectric effect, and in nonlinear optics, and in thermodynamics, and in weak interactions, and in gravity, and in relativistic effects, and anywhere. Because the interaction with the ether of space is really changing.

Let us turn now to the Michelson-Morley experiment. Experience has shown (making a little easier) that the passage of the light beam to the mirror and back, does not depend from the direction of the beam: along the motion of the earth around the sun, or perpendicular to the motion. Fitzgerald, Lorentz and Einstein came to very extraordinary — and absolutely true — conclusions: 1) there is no etheric wind (and if there is, it reduces atoms); 2) light velocity in

any direction is constant (metric theory would add: when considering equal-density space); 3) the distance between the atoms on which the mirrors stand does change. They (FL&E) did most of the journey, but then ...

Let be

$l$  — distance between the mirrors in the system at rest;

$v$  — speed of the Earth;

$c$  — light velocity;

$L$  — real distance between the mirrors in the direction of motion;

$H$  — real distance between the mirrors in a plane perpendicular to the direction of motion;

$L = H = l$  in the system at rest.

Then

$T_{\text{perp}} = 2H / \sqrt{c^2 - v^2}$ , and

$T_{\text{ax}} = L / (c - v) + L / (c + v) = 2Lc / (c^2 - v^2)$

Since, according to the results of the experiment, the times coincided,  $T_{\text{perp}} = T_{\text{ax}}$ , then

$H = Lc / \sqrt{c^2 - v^2}$ , or, what better reflects the essence

$H/L = c / \sqrt{c^2 - v^2}$

, that is, the ratio of "lengths perpendicular" to "lengths along" the axis is found. And nothing more.

But scientists made a amazing conclusion: the entire reduction was attributed to the length along the axis, and the distances in the perpendicular plane were left as they were (more precisely, Einstein does not say a word about "perpendicular" distances). This conclusion can be explained and partially justified by the fact that, firstly, in those times they were looking for the explanation for the absence of the ethereal wind, and no one thought about the width at all. And secondly, ideas about the structure of the atom were close to zero; there was no atom according to Rutherford; when Einstein published a special theory of relativity, the last word of physical thought there was an atom according to Thomson; and Fitzgerald and Lorenz worked even before that, however, Thomson's atom wouldn't help them much. The question of reducing lengths was then purely secondary — all had worried about temporary problems, to check experimentally the actual postulate there were no possibilities, and then ... then everything was recorded in divine decretals. And we still draw thick short rockets in the pictures against the background of thick long ones.

The metric theory in person of me about relativistic distance reductions says nothing; for it, this is a specific technical problem for which it does not have enough initial data; and today the reduction of distances according to Lorentz suits. Below I shall explain in more detail. But as a private person, not used to trust postulated installations ...

Formerly a secondary issue, today is no longer a secondary issue. I suggest checking it experimentally. For example: take an alpha particle, attach one electron to it, and accelerate the obtained helium ion to a certain speed. To photograph. If it's difficult technically to take photos, then be able to direct the entire system into the bubble chamber or whatever, which can fix the points of individual inputs of the nucleus and electron. As a minimum, estimate the distance between the paths of the nucleus and the electron, as a maximum, analyze the electron trajectory. Repeat many times, get statistical estimation and maximum divergence. Repeat at a different speed.

I would suggest another experiment, which is not so obvious. Repeat experience Michelson-Morley, installing some mirrors on a lead strip (6th orbit), and others — on a strip of solid hydrogen (1st orbit). Of course, the second strip can be made from plastic (2nd orbit), but still the first orbit is especial. Most likely interference picture does not flinch when turning, but ... surprises are not excluded. At least we shall be sure of the truth of the obtained  $H/L$  ratio for any systems of atoms.

Einstein had gone further. Farthest, further Fitzgerald and Lorentz, and further that point to

which the metric theory comes. Slowdown the cycle time of any rotation system in movement conditions is actually obvious. (More precisely, in conditions of movement or curvature space — with an equal-density scheme, and with metric scheme — in a non-zero metric gradient.) Einstein raised the life speed of atoms to absolute of coordinate, equating to the coordinates of space, and called the new coordinate simply "time". Then fitted curvature of space to the new coordinate. And in combination with the postulate of invariance it turned out very beautifully: the "space-time continuum" or even shorter — "space-time". Remained child's play — to describe all this on Minkowski-spaces base-encompassing mathematical model. And now a century, how it is being built, is being built ...

But it will never finish building. It's really possible to combine slowdowns and curvatures, because both slowdowns and curvature, have one physical essence — gradient of the metric. But the postulate is incorrect, incorrect because the gradient of the metric is not a coordinate, it is a characteristic. Of point. Of small neighborhood of ether elements. Very important characteristic. But to other physical processes — not to rotation of electrons around nuclei, and maybe to some variants of this rotation — this characteristic will have a different effect. Since the concept of characteristic is not so encompassing as a concept of coordinate. And, as a result of "non-coordinateness", ether elements that are "not under moving particles" in the same object do not carry any gradient. In fact, even electron rotation around proton will go "a little bit wrong".

In particular, a photon. As we saw in the initial example, it will inflict to the rod, which extended near, on the way "forward" more electromagnetic shocks than on the way "back". And it's not important amounts of exposure: the physics of the interaction has changed (by the way, the amounts will also change).

In particular, gravity. Elementary particle, maybe simple (applies to Doppler photon too, we shall consider Doppler effect later), maybe even cohesive — how much metric it emitted, emits so much — according to the clock of a motionless observer. And what changed by the fact that particle — when moving — redistributed the direction of emission? — the amount has remained the same. (Actually, some kind of minimal defect can occur, but not due to simple particles, which are the basis, but due to the binding relations between them.) And in addition, the "standing" space around will refuse to carry the gravitational metric according to the same laws as at rest state of the gravitational object. If the theory of relativity would consider situation inside an elementary particle, and not outside, it would be able to move on further. Not to the end but further.

Now about rotation systems. Any cohesive elementary particle is a rotation system. But the slowdown is determined by the balance of external speed and speed of propagated interactions. The slowdown itself is caused by the fact that the structure elements have a restriction in speed by the speed of propagated interactions. This restriction is and always acts — and when the particle is at rest. But the higher external speed — the stricter this restriction. However, inside a cohesive elementary particle the speed of propagation of interactions is higher, and therefore, the slowdown is less.

Of particular interest is the electron. Because it generates electromagnetic field. The essence of electromagnetism is better and easier to look on photon movement (a little later), but for now the main thing: the circular rotation of a simple particle produces a surface of increased metric that propagates in space. There is an internal gradient in this surface. If these rotates are repeated, then in space they form like layers — as ripples in the water. Internal structure of electron is such that it produces this unidirectional ripple all the time. The higher the angular velocity of torsion — the stronger the electromagnetic disturbances in space. And the lower — the weaker. The question is whether "external inertial speed" affects on rotation speed and, if so, to what degree. By answering this question, we shall also answer the question about the "slowdown of the electromagnetic life" of an electron during movement. But for a theoretical answer, we need to know the internal structure of electron not at ideological, but at a technical level. I do not know, but for an example we shall consider two "extreme" variants.

Variant one. The metric of electron, like the metric of any cohesive elementary particle, higher than metric of the surrounding space. In this metric the elements of the structure are rotating with "superlight speeds" (we consider them simple particles). Let it be that this rotation generates electromagnetism. The higher the metric of the medium of rotation, the less influence on it by "external movement". But the internal metric of electron's medium is hardly very high. And the lower it is, the greater the slowdown.

Variant two (unlikely, rather for illustrative purposes). All elements of the structure, except the central one, they only spatially stabilize the center. All giving electromagnetism rotation occurs inside a central simple particle. In this case the central simple particle, becomes Doppler's: during the external motion, it will accelerate internal cycles. And like accelerated Doppler photon gives more disturbances, so electron will give greater torsion and will not slow down, but will speed up its electromagnetic life.

The electron structure is most likely quite simple. But given the "abnormal" magnetic moment, in it, perhaps, there are subtleties.

I hope it's now clear why metric theory keeps silence about both distances and slowdowns. And largely ignores the theory relativity. These are private technical issues that are theoretically resolved and calculated in the presence of sufficient initial data (by the way, not only for electron, but also for proton and pion). In the meantime, there is no such data, and we must rely on experiments. But with the importance of Lorentz coefficients metric theory agrees — since they are applicable to simple particles, and, therefore, to matter as a whole.

Since there are no equal reference systems, but there is a predominant one, all reasoning about the uncertainty of what and when happened — at different observers clocks — are exercises in sophisms. As well as reasoning like: "when I'm on a geodesic turned, it's not I turned, but the whole universe turned about".

It's awkward to talk about the formula  $E=mc^2$  replicated on t-shirt stencils. It looks frankly fatuously, since no "relativistic mass" exists. Einstein, of course, had done many things to be beaten, but his concept is very interesting, especially considering the level of knowledge about nature at which it was created, so let's show a modicum of respect and remove "from the places of mass use" this obvious bug.

The results. It may seem strange, but the theory of metric has no so revolutionary effect on astrophysics. It introduces a new (non-equal-density) coordinate system, solves some of the problems (when considering black holes, quite substantial) and removes from the neck the millstone of the invariance postulate. Promotes development. But in physics of elementary particles, the effect is much more radical. Because the internal speeds of the structural elements are limited by the light velocity, but not from top, but from bottom (for simple particles). Nucleon — not a Constable's landscape, but a furiously spinning tangle of matter. With a huge amount of experimental data, theoretical understanding turns out to be close to zero. And all the cherished charm-uncharm, colored magic, virtual particles, strings, quarks, gravitons-tempalgins (no, tempalgin does remain) and other strangenesses — everything goes into the bonfire of Finnegans Wake. All needs to be explained by metric, and only by metric.

This concludes the lyrical digression on the lack of relativity, we return to the metric theory, more precisely, to its most significant manifestations. To a photon, say. If you pile everything we know about photon and try to build an elementary particle from this heap, it is unlikely that you will not agree that task of building the manticore genome seems a child's play — comparing with photon's task. So,

## Photon

Photon is a strong-bound region of high metric in space of relative low metric. Give to this region low velocity — move region. As it had been said above, the motion is a lopsided (for fixed observer) metric emission — moving object emits more metric in straight direction, than in opposite. For interior it is arisen normal rectilinear motion, but for front (fore-part) edge of region, situation will be another: low metric of environment will not be able to provide quite fast propagation of metric wave. As result, a layer of high metric is formed on front edge, therefore, something like external metric gradient arises here. Photon, violating conservation laws of momentum and energy, will begin accelerating. Since there is no limiting factor for photon except light velocity, photon will begin "finding balance with environment" only when it reaches this velocity.

Let's consider now photon's structure, taking our universe as instance.

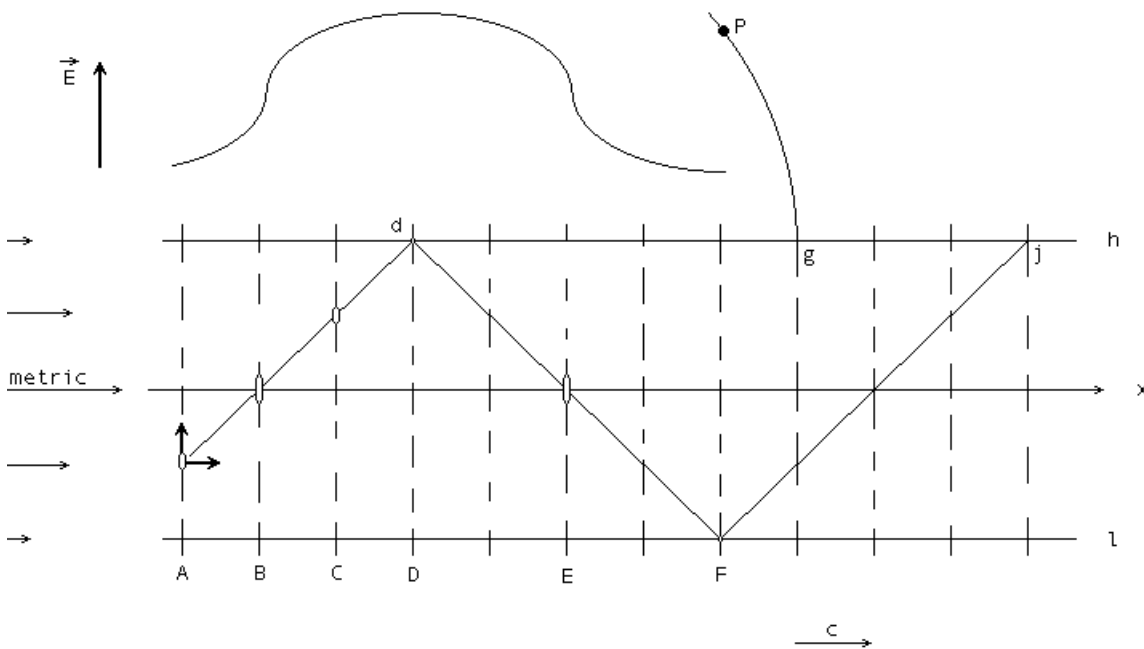
Our universe — like the universe of any simple particle — is pulsing (oscillating). This moment, as a result of Big Bang, our universe is expanding. Over time, our photons and neutrinos will "be tired to struggle with gravity" (with decreasing metric level) and begin turning along perimeter, and then, toward center of our universe. This stage I shall call below "wide" phase. Then gravitational compression will begin. The squeezed universe I'll call "narrow" phase. The nucleons will "melt", the most energetic metric generators begin to hit (and they are unlikely to have the energy "familiar to us"), generators which in a wide phase will never let anyone in. Similar collisions will have energy orders of magnitude higher than nucleon annihilation. Chain reaction, the Big Bang — and a new cycle. Of course, this is only a "picture in the first approximation"; but was the Big Bang? — was, and more recently.

Let's leave pulsation in the meanwhile, and return to motion of photon as high metric sphere.

Because high metric layer arises on the front edge of sphere, this high metric begins propagating into interior. Internal areas begin flattening sphere, transforming it to disk. But there is no balance again: new higher metric begins "setting against the slow environment" again, creating on front the layer of high metric. It can be imagined photon, which speeds up to light velocity and quite flat disk, but metric gradient is preserved. What's later?

Consider layer of high metric. Generation of this layer entails, in particular, weakening of control for direction of movement — for structural elements which inside layer. Being under the pressure of internal part and being unable to move forward with required velocity, these elements will be squeezed out, spread in layer, getting motion vector in perpendicular plane. This moment, indeed, is being created not when reaching of light velocity, but from the beginning of movement (this thing is indirectly confirmed by wave properties of material). One of randomly (or based on some moment of rotation) selected direction will turn out to be predominant, and this "perpendicular movement" will become ordered (i.e. structure elements will move to united direction).

Photon will "make tacks by the wind". In straight direction it will "send" strictly as much metric as necessary — from one hand — for support motion in defined direction with metric propagating velocity, and — from other hand — for "inexistence" of "external" metric gradient. The second — perpendicular — vector component will "take remaining motion". The higher energy (mass) of photon — the sharper tacks — the greater angle between motion axis and vector of "instantaneous motion". Photon's disk, in such motion, will be stretched to pivot (noncircular cylinder).



On figured plane of photon's motion (I'll call it ecliptic plane), plane metric wave moves with light velocity in spatial corridor between lines l and h. Photon's pivot moves on wave crest between l and h like a pendulum. This motion can be considered as motion along ordinate axis, on abscissa axis photon is displaced by plane wave. During every hemicycle of its motion, photon "renovates" wave, restoring wave's metric level. After photon's pass, metric of present coordinate of ordinate axis, propagating in space, decreases until photon's pass on next hemicycle. The closer to corridor center (X-axis), the more stable and average high, metric level of plane wave is.

Begin cycle considering from point A. Photon moves up. Suppose (without base for the present) that photon "enters wide phase" — velocity of photon's metric weight center is lower than velocity of photon's upper layer: pivot is lengthening, and its volume is increasing. Let this dynamics remains until point B — peak of photon's dilation. Let's begin analysis from this point.

Photon's lower layer is going up in field of photon's metric (high metric). And it leaves such metric behind itself. The upper layer goes up in field of metric of plane wave. Hemicycle ago it was metric of photon, but now it's considerably decreased by wave propagation in space. That's why upper layer begins "braking", and photon begins condensing. In point C this process continues — photon enters narrow phase, besides, it reveals, that photon — at whole — leaves space of high metric and enters into space of low metric, that's creating metric gradient which slows down motion. At last — in point D — photon finally stops — from one hand, and finally condenses — from other (and also photon's gravitational collapse takes place). Big Bang happens.

Where will fragments fly? Theoretically — to all sides uniformly. But uniformly not from view of Earth observer, but from view of observer on photon. But space is curved for him: he has space of high metric downward, and space of low metric upward; his angles in high metric space are greater, and in low metric space are smaller (there is effect like effect of high speed). Photon's observer doesn't even clearly understand process of lengthening of his universe, universe for him is sphere in sufficiently greater degree then for Earth observer.

So, Big Bang will be directed — downward. And directed down fragments will move in high metric space, lengthening photon to pivot again, because weight center must still gather upward fragments, which "sticks" in low metric. When center complete this work, it begins accelerate upper layer up to velocity of lower. To the moment of point E, this task will be



decided — and photon will start new hemicycle.

Temporal and spatial symmetry of acceleration-deceleration is unnecessary. And usage of proper mechanism of pulsation looks some adventurous: harmonic oscillator with vibrations of photon's pivot about high metric axis of corridor center, looks quite acceptable, explaining photon's motion without additional essences. However, there is a need for deeper balances between the gravitational compression and explosion, and such a balance should be built into the photon's cycle of motion, and its hadron phases points to same direction. In addition, linear dependence of the pulsing frequency and energy looks very natural: the less energy, the smaller the gradient of the metric at the borders, the longer photon will pick up shattered fragments after Big Bang. So we shall accept the proposed working scheme in a first approximation.

Beyond the limits of these and following reasonings, it's left "resource" of probable photon's internal torque (discourse is not about spin, today's theory links spin with sine curve).

Consider now amplitude question. When it is said about ordinary metric wave, amplitude is naturally understood as maximum metric level, metric on crest. However, this parameter is interesting only in specific cases, for example, when defining velocity of disturbance, which goes along crest of metric wave. In most cases, we are interesting in the integral of the volume metric function ("mass") and common "percussive" characteristic — momentum. If an object decelerates in space to stop, deceleration speed affects amplitude, but not momentum which is giving to environment with wave.

In case of photon's plane wave, situation is another. Though metric characteristic is important, but first place of interesting is taken by spatial sinusoid of photon's motion. That's why, doesn't entering needless terminological controversy with modern theoretical views, I'll involve amplitude as spatial photon's amplitude, interval on ordinate axis.

I count (for external observer) as much as four types of amplitude. To the first I concern spread of structural elements, "matter", metric generators of photon; to the second — high, "photon's" metric; to the third — distance between walls of corridor ( $h-l$ ); to the fourth — wide spatial corridor, appearance of objects in which can entail changing of photon's trajectory.

From theoretical point of view, the most important amplitudes are first and second, and also third-to-second ratio. Alas, it's difficult now to say something about this thing. Of undoubted interest are experiments concerning demonstration of hadron properties by high-energy photons.

Amplitude of third type is more or less clear — it connects with plane wave; it is — slightly simplifying — minimum diameter of hole, which photon passes through with hundred per cent probability.

Finally, the fourth type of amplitude — amplitude of influence on trajectory. It can be read in any text-book, that for free passage of light beam through hole, it's needed, that hole diameter must be considerable greater than wave-length. Phrase — from spatial point of view — is perfect mysterious. Really, if plane wave (photon) comes to quite wide hole, and wave can't be overtaken theoretically, what diffraction can be? and what meaning has wave-length?

The answer can be found in photon's preparation — during vertical passing of spatial corridor  $l-h$  — for its (photon's) future placement on next hemicycle. Let's return to figure and observe metric map dynamics from point D. Photon, being at upper point of corridor, begins going downward. Metric wave propagates from point d. It travels not only along line  $h$ , but also concentrically to environment. According to scheme it comes simultaneously to points  $g$  and  $P$ . Suppose  $P$  is obstacle, place where metric wave reflects or changes. Occurred distortion goes, along concentric expanding metric wave, downward — to axis  $h$  — with velocity of wave metric (decreasing, but nevertheless higher, than light velocity). If this distortion reaches point  $j$  earlier, than photon goes (up) there, then distortion changes just photon's trajectory; more, even in case of distortion "late-coming", it's not excluded, distortion "can curve" plane front. Distance between  $h$  and  $P$ , from this point of view, obviously has one order with wave-length. (This explanation is for ideal obstacle. Real obstacle produces metric waves by itself, therefore

point P is a point of meeting not with obstacle, but with disturbances, produced by it).

The movement of a photon on the simplest — it can't be simpler, this is a hint from Nature — example shows us the essence of electromagnetism. Photon doing at point "d" sinusoid (perhaps the effect is enhanced by Big Bang), "pushes" the ether space. And generate a metric surface (which has gradient) that diverges and affects the circular motion of other objects. Disturbance has two components: electric — in the plane of the ecliptic, and magnetic — in perpendicular direction.

Here it is better to imagine a lingering rotating ring (or circle) of the metric.

Ecliptic plane, electrical component: if third-party object rotates codirectionally (in parallel), then disturbances push the distant structural elements of rotation beyond their orbit, and inhibit hither; the object is repelled. If a third-party object rotates in the opposite direction (antiparallel), then disturbances accelerate hither structural elements of rotation, and slow down distant ones; the object is attracted.

Perpendicular, magnetic component, plane parallel to the ring: here the internal gradient is already insignificant, significant only force lines that generated rotation like a corkscrew — our ring is trying to bring the universe into conformity with its rotation. If the "parallel-plane" rotation of the object is in the opposite direction, then the rotating elements of the structure will begin to enter the lines of force, bringing the object closer to the ring. If co-directed, then the lines of force will push structural elements beyond the plane, further from the ring.

Mechanical magnetism is a well-known phenomenon, but not to say so explained. Mechanical electricity can also be, but it requires very high angular velocity.

So what about manticore? Let's do another lyrical digression here, in some sense this is a key point, because if a theory is able to explain everything that gets up a photon, it cannot be false. Conversely, if the overall theory does not able to explain the paradoxes of a photon, then it is not overall.

Half-particle — half-wave — from text is clear. In the material, photon also tries to follow the wave generated by it, but stronger disturbances from the electrons distort the wave. Thermal photons wander in the medium, but for more energetic photon — the higher its wave, the easier to overcome the obstacles of the environment.

Photon in motion creates a transverse (moreover, polarized) wave and moves on wave — from text is clear. This is probably the most fantastic property of a photon.

Photon wave has diffraction properties, and if the photon is not energetic enough to ignore the waves generated by the electrons, but energetic enough not to obey to them, but go around, then the advantage in speed is given to a photon with a longer wave — red (compared to violet).

The notion that photon has zero rest mass is erroneous. Photon has a completely defined and unchanging mass — regardless of whether it is in free motion, or seized by a material (in any form: even interatomic space, even atom, even electron, even nucleus). In the same time photon energy can vary — see below "Doppler effect".

Due to the fact that photon is a metric generator, no matter in what geometric trap its wave fall into — the photon always resumes it.

Penetration of photon into atom (in this case we are talking about the space between electron shells and about the electrons themselves) is prevented by high metric waves, generated by the movement of electrons — for inter-shell spaces, or elements of electron structures — for spaces inside electrons. But protection is usually holey, and such wave-lengths are found at which photons enter the material. Once inside, a photon collides with waves in material, and inevitably, in one or another degree, becomes Doppler. Ultimately, thanks to the "indomitable desire for freedom", the photon leaves the trap that seized it. But the "protection at the exit" is different from "input protection". From here follows the splitting of the absorption and emission lines of light quanta by a material (photo effects, luminescence). Possible and exit delay (e.g.,

phosphorescence). Atoms of all chemical elements differ from each other in protection systems.

Since the photon has both mass and energy, it exerts both "shock" and gravitational environmental impact.

A photon is not a carrier of electromagnetic fields. Photon creates them with his movement. At the same time, it begins to obey the laws of electromagnetism, and its trajectory can be influenced by electric and magnetic fields. But photon itself is electrically and magnetically neutral.

The diameter of the hole through which the photon passes without distorting the path should be longer wave-length.

The metric theory resolves immanently inherent for wave-particle duality contradictions. In particular, the "instantaneous" movement of a particle (including photon) in one point. Moving is not instantaneous, but with the speed of the object internal metric — higher than light velocity. Photon has an internal metric significantly larger metric of cohesive elementary particles, not to mention space. In general, just concept of wave-particle duality is filling with physical meaning.

In a wave packet, photon can change its speed and location relative to neighbors — due to the metric environment created by neighbors.

When reflected from a mirror, the reflected photon can "stick together" with the falling one, forming new photon of double mass. This becomes possible because the photon does not have structures (relative to the external universe).

Being in a "compressed state", photon actively demonstrates hadron properties.

In space, the photon "rushes nowhere", it "lazily follows" generated by it (and, possibly, reflected) wave. The inner life of a photon weakly correlates with external influences.

The internal structure of a photon — like any simple particle — is represented by our universe. Astronomy is the study of photon from the inside.

### **Neutrino**

Get a photon and begin pouring mass into it. Photon will become gamma-ray photon, sine curves will be closer and closer, until —, until trailing edge of the next coil touches front edge of previous. Qualitatively new situation will arise: photon transfers to neutrino.

For neutrino, ratio of its mass to environment metric is so large, that it (neutrino) "makes pulsing cycle" faster, than completely goes away from place of previous pulsation. As a result, trajectory of neutrino's motion proves to be other, than photon's trajectory. When photon "drifts" in space, neutrino "hacks tunnel", clenches-unclenches in movement along ray (approximately, of course: trajectory can be easy imagined, for example, as helix). Neither plane, nor electromagnetic wave. Mass of neutrino region is so large and condensed, that it's too difficult for meeting metric waves not only to stop neutrino, but also to influence on its trajectory noticeably. And "pulsing metric shock" is strong enough to "make difficult neutrino's access". Only when neutrino passes region of heavy cohesive particle, it's arisen probability of collision with structural element of this particle, which is heavy enough "to be target for neutrino".

It follows some conclusions and firm suppositions from such description.

First. Neutrino is a non-structured, simple particle.

Second. Neutrino moves with light velocity.

Third. Neutrinos are not some particles of discrete energies, but continuous spectrum of particles like photons.

Fourth. Doppler's effect can make neutrino from gamma-quantum. And gamma-quantum — from neutrino.

Fifth. It can be supposed, that neutrinos of only few parts of spectrum can be used in building of stable cohesive particles, but cosmic background contains neutrinos of the whole spectrum.

Sixth. It can be supposed, that mass of "free" neutrinos in universe is considerably larger than neutrinos' mass in stable cohesive particles. Hence, the mass of the universe is underestimated.

Seventh. Neutrinos together with photons form all structural components cohesive elementary particles, and neutrinos, as a rule, are rod, around them, holding them, photons rotate. Quarks — if exist — are the components of the nucleon structure, at the next level will be already only neutrinos and photons.

### **Doppler effect**

Let's give the photon an external impulse, or — even better — imagine that observer in elder universe got needle, put tip into our universe, and pushed our Sun by tip in direction of our photon motion. Observer gave additional momentum to our photon. Doppler's effect is that momentum doesn't disappear; photon "spreads" additional momentum in whole volume and begins sending in direction of motion more metric — like object in inertial motion. If somebody applies the theory relativity to the Doppler photon, then he can advance substantially further, because the intra-photon ether itself ceased to be "standing", acquired gradient. Distances (at least the pivot's thickness) reduce — just like volume — and density increases. A higher density lead to higher ratio the density of the photon to the density of the medium, and a larger ratio — to the acceleration of life and reducing cycle time. And to increasing energy. But the mass and permanent generated photon metric will remain old.

All this is true for any simple particle. Including, of course, for the one which is part of the material.

All photons to one degree or another are Doppler.

An interesting question arises: is it possible with any "wave exercises", like partial reflections and diffraction, restore the "resting position"? I can offer one way to partial recovery, unfortunately destructive: make a monochromatic photon beam Doppler's, achieve "gluing" falling and reflected photons and evaluate the resulting double mass photon. The Doppler effect should disappear. In the sense that the reflected gradient should repay the falling one. In general, on Doppler photons (not necessarily accelerated, it can be used, for example, the Stokes rule) it is worth scrolling a significant part of the experimental base of the properties of light and nonlinear optics. Deviations are not planned but not excluded. I can not guarantee that the experience of the double Compton effect (checking the Compton effect on photons reflected, say, at an angle of 135 degrees as a result of scattering by electrons) will give the expected results (the same as on "normal", non-Doppler photons of the same energy).

### **Planck constant**

I shall not venture to assert, but it's not excluded that the proper (self) cycle time of any simple particle in the unity-metric is constant value. Let's call this constant ... say, h-halved.

### **Heisenberg uncertainty**

The next in turn quantum fiction. There is no any uncertainty, but since the estimate as Big Bang moment of the, for example, central element of the electron structure, as well as its (Big Bang) concrete consequences, causes difficulties, then the uncertainty exists de facto.

### **Cohesive elementary particles**

In fact, this question has already been disclosed. Metric theory removes the core brake shoe blocking understanding of the structure and physics of elementary particles — light velocity.

All quantum numbers are pertaining to peculiarities of internal particle structure, in the first

instance to existence of this or that components and torques. And it must be paid attention to structural elements' each to other behavior as well as to their internal "vital activity".

The structure and dynamics of life of simple cohesive elementary particles (first queue, electron) for sure can be resolved at the level of computing model.

With nucleons it will be harder. On the one hand, and their structure cannot be too complicated, because otherwise Nature could not have created them with such ease. But on the other hand, experiments on probing the internal structure describe a proton as a rather complex object. Amazing proton resistance to external stimuli and spontaneous transformation of a neutron into proton (with the birth of pion) even allow us to consider the idea that — for a certain volume and metric — proton is a natural homeostatic state and can both generate simple particles from the inside, and absorb the missing components from the outside. Here simple modeling may not work. Even without such an exotic — amount of structural elements will be not so small.

A lot of resonances, as Nature's attempts to create matter, and their instability are perfect "natural".

Weak interactions at this stage can be considered as metric disturbances of certain kind. Perhaps different. After creating a base of stable structures the issue of "vulnerable points" will be resolved naturally and progressively.

### **Wave properties of material**

Space is zone of low metric, cohesive particle — middle (closer to low), structural element — high metric. Moving in low metric, middle metric creates (in straight direction) layer of "higher than middle" metric: middle metric, "setting against light barrier", spreads in layer, losing "feel of direction". Like man under snow-slip can't understand where are up and down, element of structure, which come to layer, can't "understand where to go further"; in any case determination of trajectory descends. Element of structure begins choosing trajectory from new "nonlinear" situation, from some former minor circumstances, at least from "its internal reasons". Outwardly, it seems like stochastic movement in layer. "Cohesion" however remains, and "gone aside" component "pulls" other components — they have "resources of movement in layer" in a like manner.

But motion axis, as axis of maximum metric, is not annulled by anybody, and "walked in suburbs" center of mass goes back to axis — to begin "next promenade".

"Walks" on plane, which perpendicular to motion axis, can also be described as realization of "velocity defect", forming as difference between classic and relativistic velocities.

Inasmuch as particle consists from components, and each of them is quite self-dependent, the particle, unlike photon, can't order self oscillations around motion axis, or if can — to a certain degree — then our registering abilities are not enough now; and we use Schroedinger's equation and Heisenberg's uncertainties, but these probabilities and uncertainties are sham (in sense, that theoretically it can be get metric map of such resolution, which eliminates uncertainties of this level).

Layer of "higher than low" metric as well as metric generators of cohesive particle, produces metric waves, propagating first of all in direction of motion. If velocity is high enough and an obstacle, like diffraction grating, arises on the particle's path, it can be surely predicted active participation of generating disturbances (waves and just layer) in particle's trajectory forming — during "passing through obstacle" as well as "after passage motion stabilizing". That's why wave properties of particles are very natural.

Particles — yes, but atoms (as nucleus-shells systems) and certainly molecules — no. Proton and electron in hydrogen atom don't make common field of high metric — here "everyone struggles alone". Electric connections remain, but "stochastic jerks to the side" grow (tunnel effect); when velocity increasing — without any "plasmatic" collision — it involves increasing of probability of molecule decay and even of atomic ionization: high speed electrons "will be busy

with their own motion". And if it is so, "subluminal spaceships", alas, are technically unreal.

### **Repulsive forces (elastic interactions)**

It can be said, oversimplifying, that majority of Nature's plays bases on rotation of high metric regions in space of low metric. Small objects (parts of simple particles), rotating, increase environment metric, what involves, as a result, strong and gravitational manifestations. A bit larger objects (simple particles in cohesive particles), rotating, produce repulsive forces, which prevent from "spontaneous-uncontrolled growing" of the whole, and region of their influence also exceeds the bounds of this whole. At last, large objects (having charge particles), rotating, produce electromagnetic fields, jumping-off to qualitative higher forms of matter organization. That's the end of staircase (precisely, of its elementary stairs). (This common essay doesn't concrete of course).

By not quite understandable reasons, obviously fundamental repulsive forces play in modern physics role of Cinderella. Elastic interactions, dispersion ... Well, one billiard ball of an elementary particle does not penetrate into another, but flies off ... Why doesn't it penetrate? Why is one elementary particle approaching another, suddenly turns away, dissipates? How to explain it through the "four fundamental type of interaction"? Rutherford empirically derived dispersion formula, but it doesn't explain anything. And the reader probably starts here to recall magnetic fields, momentum conservation law ... what emphasizes the level of catastrophic misunderstanding of one of the fundamental forces of Nature, fundamentally superior to weak, strong and electromagnetic interactions and second only to gravity. A concrete example of the consequences: how can one build a kernel model without understanding these forces? — nohow.

Imagine a cohesive elementary particle as a set of simple particles, each of which moves along a curved route with speed, exceeding the light speed. With this movement, it's quite obvious that particles will generate repulsive metric waves that becomes a barrier to the insufficiently energetic "guest", although metric level inside the cohesive particle is "very attractive" for him (the guest). If the "guest" of the nucleon is photon of the X-ray part of spectrum, then it may enter but not leave the high nucleon metric; if gamma ray, then it has a chance to "flash the nucleon right through" — in the case that its path don't lie too close to "something bigger than it". Electron at "natural speeds" cannot approach proton and will search orbit around proton in space. And not because it's scared to violate Heisenberg's uncertainty.

Because of blowing localization, photons easier "breaks defense" of nucleon, and photons are "non-destructive". If having own structure particle is "well-speeded up", then particle impact to nucleon entails internal nucleus bonds rupture and, as result, nucleon's decay (and generation of new particles from fragments and "pressed into particles" ether).

"Cohesive particle guarding" is not the only work in atom that repulsive forces have. Let's look on atomic electron shell. Inasmuch as electrons have charges, it's not simple to understand where is border between electromagnetic and mechanical inter-repulsion (one- and multi-shell) lies, but repulsion of external photons has mechanical nature. Speeds of electrons and, therefore, outward metric waves are high enough to parry incident photon. Indeed, if photon is a gamma-quantum, shell repulsion is not an obstacle for it, however less energetic photons can "go around defense" or "be beaten off". About leakage of this defense it was written above.

The nucleon repulsive forces, although longer than the strong ones, are also not very long. But still long enough to push the electron into its first orbit. Of course, each nucleon "repels" on its own.

### Strong interactions

Imagine nucleon (proton), consisting from nucleus (small radius) and meson cloud (large radius). Metric of cloud is lower than metric of nucleus but higher than metric of space. Suppose other nucleon (neutron) is approaching with velocity high enough to pass external layers of proton's defense (by repulsive forces). If neutron's velocity is not so high to break defense of proton's nuclear defense (with disastrous effect), then region of heightened metric will arise between nucleons — region of their meson clouds. This region chains nucleons, it is just strong interaction.

Possibly, pions (including pi+meson) can "change hands of owners"; possibly, nucleons together "own" pion (pions), like two atoms together own valence electrons; essential important thing is only one new system formed on place of old two, and this system is quite stable (because it's not so simple to break "chain of high metric"). "Ejection" of part of matter from new system — mass defect — is natural, because now every nucleon "covers itself from low metric of environment" at less solid angle (mechanism of nucleon's self-regulation — as it was noticed above — is amazing thing, if not mysterious).

### Conclusion

The final station on this road will be a notion of what are ether elements. This moment we can imagine them as many elastic grains that tightly filling space. When we'll arrive at this station, we can once again finally tell ourselves that conceptually the physics of creation is comprehended by us.

`And if you take one from three hundred and sixty-five, what remains?'

`Three hundred and sixty-four, of course.'

Humpty Dumpty looked doubtful. `I'd rather see that done on paper,' he said.

Alice couldn't help smiling as she took out her memorandum-book, and worked the sum for him:

$$\begin{array}{r} \_ 365 \\ \underline{\quad 1} \\ 364 \end{array}$$

Humpty Dumpty took the book, and looked at it carefully. `That seems to be done right — ' he began.

`You're holding it upside down!' Alice interrupted.

`To be sure I was!' Humpty Dumpty said gaily, as she turned it round for him. `I thought it looked a little queer. As I was saying, that seems to be done right — though I haven't time to look it over thoroughly just now — '

L. Carroll "Through the looking glass —"