Shot report

DEDUCTION OF EUCLID STATEMENT ABOUT PARALLEL LINES INTERSECTION AS THEOREM

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A classical Greek mathematician Euclid formulated a statement about two parallels intersection [1] in the third century B.C. However, the failure of the efforts to apply purely geometric images and premisses for its deduction as a theorem has made Euclid refer the statement to the number of axioms.

The efforts to prove the fifth axiom took two thousand years. Only by 20-30s of XIX century thanks primarily to the works of Lobachevsky N.I. and also Boyom J., Gauss K. and others [2] a new non-Euclidian geometry – hyperbolic geometry of Lobachevsky - was created [2, 5]. For this it was necessary to give up on the fifth axiom and to offer instead of it the fact that ***through a point out of a given line pass at least two lines parallel to the given one.***

The angular sum of a big enough triangle constructed on three parallel lines can have as small as we please angular sum (less than 180° (geometry of Lobachevsky) or more than 180° (spherical geometry of Riemann)). In small dimensionality domains such a geometry is almost undistinguishable from Euclidian one.

Therefore, at present the statement of Euclid has not been proved yet. It is clear that it is possible to make infinitely many geometries as well as logical systems. Only one thing remains unclear – which of them is realized in the surroundings? And aren't some of them realized within the frames of Euclidian geometry itself, i.e. in geometrically small dimesion?

The purpose of the given work is to prove the statement of Euclid as a theorem on the ground of the old system of postulates and axioms (synonyms). For this we formulated the statement of Euclid in the form of a theorem: *every time when a line being intersected by two other lines forms inside angles with them the sum of which is equal to two right ones, these lines are crossed from that very side from which these angles are altered equally.*

Deduction. Let us assume that in accord with Euclidian axiom the distance between crossing points **A** and **B** of a line with two other lines **a** and **b** with inside angles **α** and **β** equal to the sum of the two lines is 1m. Let us assume that the lines **a** and **b** are crossed somewhere in the point **C** (Picture1) and in the formed right triangle **ABC** whose angles **α** and **β** are almost right (89º 59' 59"), the apical **C** angle **γ** is one angle second altered (1"). Then the right angle side **AC** or **BC** has approximately the distance (equation 1):

$$AC = 1/\mathrm{tg}\,\gamma \approx 2.06 \times 10^5 \text{ м.} \qquad (1)$$

However, both noted above logical reasoning and numerous other ones [2-5] are very little applied to the deduction of the Euclid statement as a theorem. To our opinion, the main cause of it – is the scholastic attempts of application purely geometric images and premises for it.

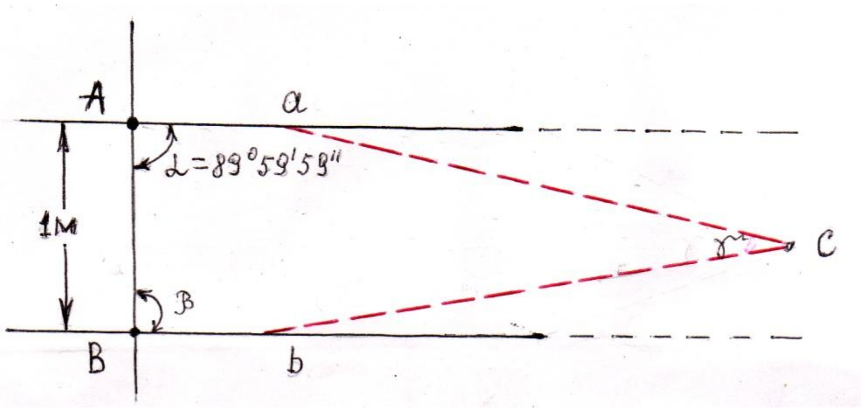
For the Euclid's statement deduction let us construct a cone **ABDC** by rotating the right triangle **ABC** (picture.1) near one of its sides and match the central points **XYZ** with the point **C** (Picture 2).

Let us assume that upon the condition of a zero alteration of the inside angles of the lines **AB**, **AD** and **BD**, the squared distance of the right angles' sides **AC, DC** and **BC** $(\mathbf{dl})^2$ is equal to **[2]:**

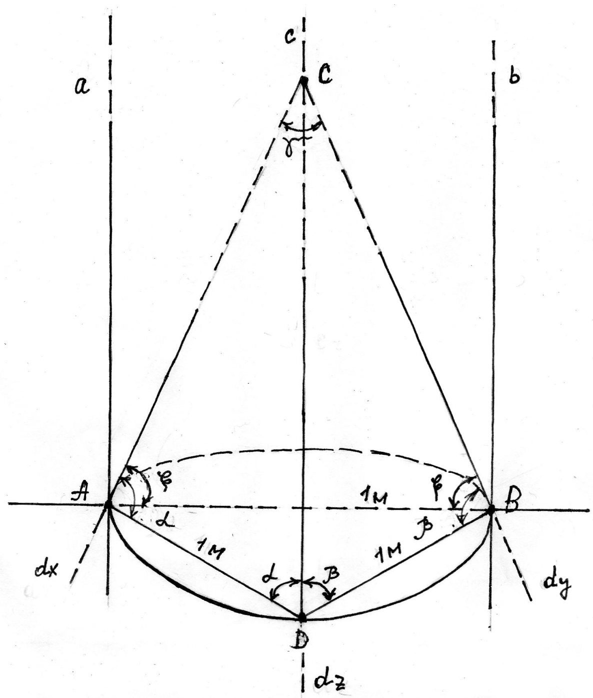
$$(dl)^2 = dx^2 = dy^2 = dz^2, \qquad (2)$$

where dx, dy, dz are the differentials of the coordinates.

Let us consider the processes really taking course in the Dekart coordinates of the Euclidian space. For example, light-induced reactions, diffusion bounded processes in the shot of a multienzyme complex, and others [6-8], in which the number of successful collisions leading to final products for an average time Δt= 10^{-10}sec is 10^{10}, are referred to such ones.



Picture 1. When the lines **a** and **b** are less than one angle second altered the length of the right angle side **AC** grows up to astronomic sizes relative to the side **AB**. At more than 1" alteration of the lines **a** and **b** the length of the side **AC** or **BC**, vice versa, reduces.



Picture2. Through the three points **A, B** and **C** on a circle go three parallel lines **a, b** and **c** with the distance of 1 m from each other. Let us assume that in every of the three inside opposite angles **α, β** and ξ of the right triangles **ACD, ACB** and **DCB** a two angle seconds (2") less than 90º circle perimeter alteration takes place. Then the sum of all the three inside angles **α, β** and ξ will be six angle seconds (6") less than 360º (3), and the apical **C** angle of the right cone is equal γ = 6".

Operating with these conditions the hypothetical area of the circle perimeter of the cone **CABD** can be calculated from the formula (3):

$$(2\pi R)^{10} \text{ x } 1/tg\gamma, \text{ или } 10^{10lg2\pi R}.\ 1/tg\gamma = 0{,}3218 \text{ x } 10^{10} \text{ м}^2, \quad (3)$$

where the cone base radius R= 0,5 м, γ= 6''.

The analysis of the formula (3) points to a flexible character of the alteration of the inside angles of the intersection lines **AB, AD** and **BD** with the lines **a, c** and **b.** Because of different geodesic flat distribution of the last, the chance of the intersection of **a, c** and **b** in the scale of three-dimentional space (Picture 3) is extremely ignoble.

A great number of chemical processes taking course while forming geometric space in living systems are known in literature [8]. The rate of these processes behavior is determined exceptionally by the collision frequency of the reacting elements [6-8].

However, in a respectively large scale of **XYZ**-coordinates the chance of the particles' collision is so ignoble that it can be taken for1. But changing from a three-dimensional system to a two-dimensional system of coordinates the collision frequency of the reacting particles grows tenfold, and to a one-dimensional system – 100-fold [8].

It is known that diffuse reactions have got three-dimensional distribution. For example, 10^{-10} mols of adenosine triphosphate (ATP), adenosine diphosphate (ADP) and phosphate (Pi) mixture are distributed in the body in the following concentrations:[Pi]= 10^{-2}mol, [ATP]= 10^{-3} mol and [ADP]= 10^{-5} mol [9]. The content of ADP normally is always more than that of ATP.

From about 100 000 encoding and they are distributed in the three-dimensional system of coordinates in molecular ratios as 10^{-5} x 10^{-3} x 10^{-2}.

The analysis of the expressing genes number depending on their specialization shows that about 50% of all informative (template) mRNA of an animal and human body cell is represented by one kind of the mRNA; about 35% - by a wide range of the mRNA kind and 15% - by not more than 7-8 mRNA kinds [10].

The first mRNA fraction (housekeeping) serves as templates for cellular protein synthesis. The rest two mRNA fractions are referred to "luxury" genes and provide only specialized functions.

Then, from the given above data and the fact that the Universe is asymmetrical in itself [6, 11], one can conclude: the circle perimeter area of the cone **CABD** in 0,32 x 10^{10} m^2 (3) in the three-dimensional space is distributed asymmetrically. The change from a three-dimensional system to a two-dimensional and further to one-dimensional system of coordinates is attended both with the alteration increase and matching of the inside angles of the line intersection with the other two lines.

$$dx\text{- }dy\text{: }{}^{x}10^5 \text{ м}^2;$$
$$dx\text{- }dz\text{: }{}^{x}10^3 \text{ м}^2;$$
$$dy\text{- }dz\text{: }{}^{x}10^2 \text{ м}^2.$$

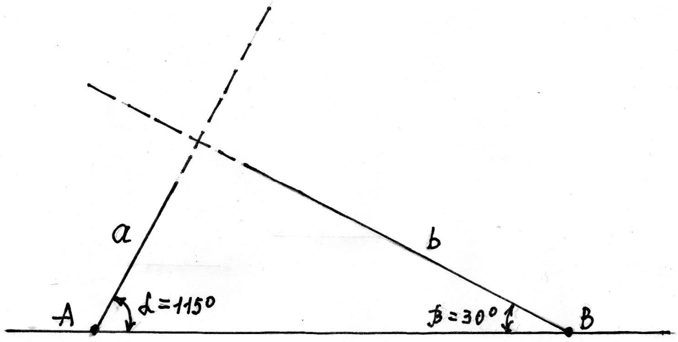
It is meant that the chance of the intersection of the lines **a, c** and **b** increases considerably with the area volume reduction in the space of Euclidian, but not non-Euclidian geometry.

It is also follows from the fifth postulate that: if the lines **a** and **b,** at an intersection with a third line, form inside angles with it, the sum of which is less than 180º, these lines will certainly be intersected from that very side of the line, with which this angle sum is less than one of two right angles.

This statement of Euclid bears purely logic loading which has no geodesic substantiation. For example, let us assume the line **AB** (Picture3) as an X-axis, and **α-** and **β-** as the line inclinations to the X-axis. Then, from the values of slope ratio of the lines **a** and **b** to the X-axis **(AB)** equal to

$$tg\ \boldsymbol{\alpha} = -2{,}1445 \quad \text{and} \quad tg\ \boldsymbol{\beta} = 0{,}58,$$

one can conclude that the lines **a** and **b** cannot be intersected as they lie in different angular coordinates.



Picture 3. The lines **a** and **b** cannot be intersected in space because of different geodesic coordinates of distribution.

In geometries of Lobachevsky and Riemann the squared distance between nearly points (x^1, x^2) и (x^1+dx^1, x^2+dx^2) is determined by the congruence (4):

$$(dl)^2 = \delta_{ik}(x)\, dx^i\, dx^k \qquad (4)$$

where δ_{ik} is a template tensor, defining the structure of geometry.

The study of the δ_{ik}-dependence on the coordinates allows proving that the space of finite extent, but having no limits, possesses curvature. The indexes **i** and **k** (i= k= 1, 2, 3…) exactly rest on different disturbance values of the inside angles of the triangle [2].

In its turn, in the introduced by us deduction of the Euclidian statement about parallel lines intersection $(dl)^2$ from the point x^1, x^2 to x^1+dx^1, x^2+dx^2 also possess curvature, but its geodesic parameters are the straight lines (5)

$$(dl)^2 = (dx^1)^2 + (dx^2)^2, \qquad (5)$$

as δ_{ik}-template tensor of the Euclidian space is exclusively defined by equal flat alteration angles, which was to be proved.

It is important to emphasize that in the present work the question is about a new geometry which is really implemented in the close round us two- and three-dimensional Euclidian space.

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