

THE CAUSE OF THE ORBITAL MOTION

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Abstract: *During researches, I came to conclusion that any physical object is internally infinite, and that any space is represented by the matter. Hence, the orbital motion is realized via thin medium. I provide a critical review of concepts of Descartes, Newton and modern viewpoint. I provided some simple experiments, checking two concepts. I assume that orbital motion is caused by both equilibrium of pushes from different sides of interacting object, and by displacement of all the system of these bodies.*

Keywords: *attraction, central body, distant action, planet, orbit, tangential force, thin medium, push.*

INTRODUCTION

Idealizing the distant forces, physicists often forgotten physics. If the force acts between two object, than the space between them is able to accept and to transmit motion. Such an ability is no more than mass. From the formula we know that $F = ma$. Hence there should not be the force without mass. Such an approach permitting high level of abstraction put before physicists unsolvable problems in theory.

MATERIALS AND METHODS

Planets, electrons, floating bodies, speculation.

DISCUSSION

The first scientist, who explained the orbital motion, was Descartes, proposing that circular motion of a thin medium (ether) carries planets. Newton rejected his concept due to non-correspondence between the motion of the vortices and that of planets: “The hypothesis of vortices is pressed with many difficulties. That every planet by a radius drawn to the sun may describe areas proportional to the times of description, the periodic times of the several parts of the vortices should observe the duplicate proportion of their distances from the sun; but that the periodic times of the planets may obtain the sesquuplicate proportion of their distances from the sun, the periodic times of the parts of the vortex ought to be in the sesquuplicate proportion of their distances. That the smaller vortices may maintain their lesser revolutions about *Saturn*, *Jupiter*, and other planets, and swim quietly and undisturbed in the greater vortex of the sun, the periodic times of the parts of the sun’s vortex should be equal; but the rotation of the sun and planets about their axes, which ought to correspond with the motions of their vortices, recede far from all these proportions” [Newton, Principles: 503]. In such a way, Newton postulated strict correlation between hypothetical vortices and planet.

Nevertheless, Descartes emphasized that the velocity of a medium (e. g., water) may not correspond to that of carried body (e. g. of a charged bark). In one example Descartes claims that the velocity of bark is greater than that of water [Descartes: 212] in other — in contrary [Descartes: 219]. In order to check these statements I performed experiments in a stream with a pencil and close by proportion a porcupine’s quill. The former moved faster that confirm the first conclusion of Descartes. Furthermore, the motions in a thin medium and planet could be quite independent, as a velocity of electrons in a road and that of a bicycle, rolling down a slope.

Newton considers the orbital motion as the result of interaction between two immaterial forces: the force of attraction and the tangential force. For the latter he could not found natural reasoning and was forced to appeal to the supernatural being: “Gravity might give the planets a motion of descent towards the Sun... yet the transverse motion, by which they revolve in their several orbs, required the divine arm.” [Newton, Letters: 34].

Such explanation held out at least up to the end of XIX-th century. In the “Dialectic of nature”, Engels mentions: “If attraction, bombastically called by Newton universal gravitation, is

considered as the essential property of the matter, then, where is a source of the incomprehensible tangential force that for the first time only realizes motion of planets by orbits?” [Engels: 349]. And afterwards: “Let us consider movement of any planet around its central body. Common scholar astronomy explains together with Newton ellipse, ascribed by this planet from the mutual action of two forces — from the attraction of the central body and from the tangential force, carrying the planet in the direction, perpendicular to this attraction...” [Engels: 394].

In XX-th century science reduces this version: “No tangential force is needed to keep a planet in its orbit... because the planet would coast in that direction anyway” [Feynman: 7-3]. According to opinion of physicists, the planet moves by inertia and, simultaneously falls on the central body. Flying beyond the latter, planet continues to fall in the direction, parallel to the surface of the central body. Here we can ask: why Newton, who perfectly knew about the inertia, introduced additional and dubious force? The answer is that the tangential force acting by the perpendicular to the force of attraction that ever connects centers of masses of bodies, so, the fall by the action of the latter parallel to the surface of the central body seems not probable.

In order to prove this latter statement I performed simple experiment with two main forces: inertia and attraction. I rolled iron balls (6 mm in diameter) parallel to diameter of a round magnet (7 cm). The minimal distance was about 1 cm. The faster balls rolled beyond the attraction of the magnet. The slower one were attracted at different distances, depending from their speed. Few of them went in the direction of magnet’s attraction up to one radius deep — and no more. None of the balls had made a turn around the magnet.

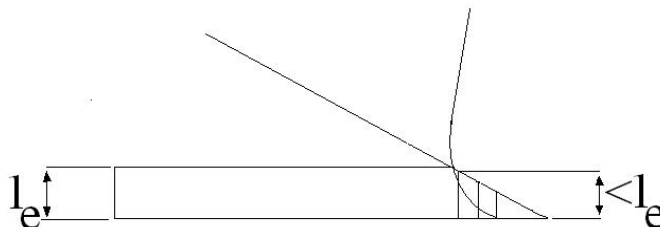
Correspondingly, in the frames of quantum mechanics Bohr assumed that electron is found on a peculiar “energetic” stationary orbit, where it not loose energy and not falls on the nucleus in spite to its attraction to the latter. Bohr confirms that such a postulation is not the explanation [Bohr: 161].

From my side, I concluded that any physical object is infinitely divisible — hence, infinity is not a number, greater that any taken at advance, but property of any component to be composed.

Then the limit of division on infinity of any object is infinite totality of its and only its parts: $\lim x: \infty = x : \infty_{x \neq y} = x : x = 1_e$, where 1_e is elementary, infinitesimal or infinitely small unit, indivisible further. Any such unit cannot enter inside the other one and to form $2_e = 1_e$. So, abstracting from the matter we received its fundamental property — impenetrability. There is no absolute void and relative one is a phenomenon of a thin medium. Thus, in daily practice we accept the air for emptiness.

I also search the so-called space, more exactly, totality of directions and dimensions, composed by them and which a the properties, permitting co-existence and not coincidence of components of infinity.

In private, analyzing section of ray, composing angle, I found that there is no curves and oblique lines:



Even more illustrative is the paradox of Democritus: If to dissect the cone by the plane, parallel to the base, how should we think about surfaces of the sections: are they equal or unequal? If they are unequal the cone will be irregular [figure], because [in this case] it will contain in itself many step-like ledges and [therefore], unevenness; if they are equal then the segment will be equal and the cone will accept the form of cylinder, since it will be composed of equal, and not of unequal circles, that is the greatest absurdum” [Materialists: 107]. Democritus proposed choice from two mutually excluding options. Nevertheless, they may be set together: the cone consist of steps, and

each of them is cylindrical. However, applying the same judgement to longitudinal sections of cone, we will accept the totality of cubes, in which volume is measured.

Each cube is portrait of infinitely small unit. On the infinitely compose, real level, there is no cube composing others and there is no smooth boundaries. Here the definition of absolute dimensions is not static, but dynamic one. The dimensions flow in six parallel and perpendicular infinitely composed directions, and the space, composed of them, cannot be void.

Any medium may act like a mediator between two greater bodies. If the force of water between bodies is greater, it pushes them. Thus, an ant, fallen in the water will be pushed from man's fingers. If the force of bodies is greater, then they ousting medium from interval between them, the medium is accumulated after the bodies and pushes them one towards another. Both such action could be observed on the water, when light object of near size — chips, boats, vessels are “attracting” one towards the other.

The premise of the orbital motion is equilibrium of these two forces. Both it was observed inside the water: small bubbles of cavitation turn around greater ones by stable orbit [Kornfeld: 94]. Nevertheless this equilibrium is not sufficient. I think the deal is in the motion of all the system: since the totality of object cannot be shifted, each motion is realized by closed trajectories. So, the planets rotating around the Sun because of the motion of Solar system, electrons turn around nuclei because of the motion of bodies, etc.

Let us assume an Earth-like planet, covered with quiet ocean and quiet atmosphere. Because of centrifugal force any floating body will tend from poles to equator. Also, delaying from the planet, it will shift westwards relative the planet's surface. So, trajectory of such body outside equator will be a kind of spire; and on the equator it will form stable circular orbit.

CONCLUSIONS

- The interaction between bodies is realized via material medium.
- The heavier bodies move with greater velocity in the stream of medium.
- There is no straight correlation between the speed of medium and that of heavy body.
- The orbital motion cannot be result of the force of attraction only.
- The tangential force is not sufficiently grounded.
- The emptiness is relative phenomenon of thin medium, and absolute void does not exist.
- The orbital motion is the result of the balance between opposite pushes, and the onward motion of all the system.
- The distant actions, including orbital motion via water are well-known in the science.

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