

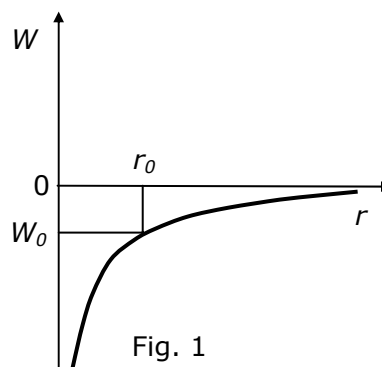
THE THEORY of CAPTURE of SPACE BODIES

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Abstract

In the article the theory of capture of space bodies is given, which one does not exist in a modern physics.

Concerning capture of one space body by another the modern cosmology gives the unequivocal answer - it is impossible without presence of the third body. The explanation is very simple. The gravitational energy interaction of bodies is transformed into a kinetic energy of "falling" them against each other. If a trapping body it is little as contrasted to arresting (central), the trapping body will describe around of a central body a parabolic trajectory and again will leave in perpetuity. The main reason of impossibility of capture is, that the trapping body is incapable by any way rather fast to lose exuberant energy. The energy loss is possible only at the long-lived revolution around of a central body under activity of tidal and other forces, which one all are together too small for embodying capture at once. The change of a potential energy of two bodies, interacting at the expense of a gravitation, how it itself is introduced by a modern cosmology is shown on a figure 1.



In any point r_0 a potential energy of a body m (the central body M is in point of origin), equal W_0 is simultaneously peer to a kinetic energy of a body m , that requires an energy conservation law (common energy is peer to zero point). Therefore in any point a body m capable "to recoil" on indefinitely large distance from M and its capture is impossible. "Within the framework of a gravitational problem of two bodies capture or outbreak are impossible, as there are absent factors which are capable to change a full mechanical energy of bodies". Physics of space, "Soviet encyclopedia", M., 1976, page 74. That the capture has taken place, the body m on indefinitely large distance from M should have negative energy, that physically it is impossible, since the potential energy m this condition is peer to zero point, and the kinetic energy is always plus. Is received that the body belonging to a solar System has some total energy having negative value, therefore it can not abandon a system (outbreak is impossible). The body not belonging to a solar System has some total energy (kinetic) always having positive value; therefore it can not be captured. Thus, from a point of view of modern science, any space system is isolated in relation to a mass transfer. To straight lines a corollary it is the conclusion that all bodies belonging to a solar System, belonged to it always, therefore, the solar System could be formed only simultaneously and of one protoplanetary of a cloud.

The reasoning of the orthodoxes in a considered problem are so convincing, that it should seem, alternative by it does not exist. However observation data, for example, backward motion of some satellites, reverse rotation of some planets, constant clearing of interplanetary dust, meteorites both comets and set others with all evidence display an

inaccuracy of notions of an official cosmology, both concerning formation of a solar System, and concerning the theory of a gravitational interaction as a whole.

New physics absolutely on diverse imagines gravitational interaction of two bodies. The potential energy of connection of these bodies sums up of a potential energy of attraction and potential energy of repulsion:

$$W_{tie} = -\frac{GMm}{r} + \frac{mV^2}{2} \quad (1).$$

Allowing a law of conservation of angular momentum, which one for invariable mass will be:

$$Vr = \alpha \quad (2)$$

and substituting (2) in (1), we shall receive:

$$W_{tie} = -\frac{GMm}{r} + \frac{m\alpha^2}{2r^2} \quad (3).$$

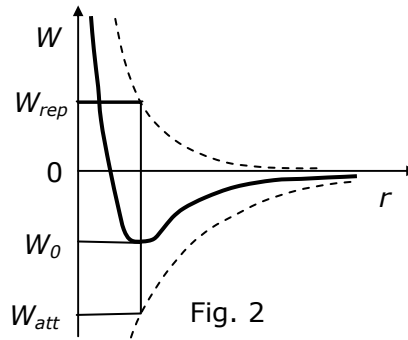
Differentiating (3) on radius and equating a derivative to zero point, we shall discover radius of orbit, at which one the binding energy has a minimum:

$$r_0 = \frac{\alpha^2}{GM} \quad (4).$$

By substituting (4) in (3), we shall discover a binding energy of two bodies:

$$W_0 = -\frac{G^2M^2m}{2\alpha^2} \quad (5).$$

The change of a potential energy is shown on a figure 2.



As it is visible from a figure, the body m will be moves around of a central body on a steady circular orbit of radius r_0 , since the system thus has a minimum of a potential energy. If m to impart some additional energy not superior that is determined by the formula (5), orbit will become elliptical. If the exuberant energy will be peer to a binding energy, orbit will become parabolic and the system will be destroyed because of removal m in perpetuity. The energy conservation law in case of capture is executed for the reason, that half of energy of attraction passes in energy of a repulsion and to delete m in perpetuity, it is necessary to impart this body energy, defined expression (5), i.e. second half, therefore common energy on infinite removal of bodies from each other again will become zero. Thus, the capture is unavoidable for any body, if its kinetic energy on indefinitely large distance from M does not exceed a binding energy (5) on steady orbit.

Let's suspect, that on indefinitely large distance from M the body m has a kinetic energy E_k component some share K from a binding energy W_0 on the future circular orbit:

$$E_k = KW_0 \quad (6).$$

Then the equation (3) can be recorded so:

$$W_0 + E_k = -\frac{GMm}{r} + \frac{m\alpha^2}{2r^2} \quad (7).$$

Substituting (6) in (7) and allowing ratio (4) and (5), we shall discover the formulas for a perihelion and aphelion of orbit:

$$r_p = r_0 \frac{1 - \sqrt{K}}{1 - K} \quad (8), \quad r_a = r_0 \frac{1 + \sqrt{K}}{1 - K} \quad (9).$$

Equating (8) expression (13.19) [1], we shall discover an eccentricity of orbit:

$$e = \sqrt{K} \quad (10).$$

The formula (10) displays that again captured bodies have orbits with large eccentricities. For example, the body having a kinetic energy in perpetuity component only 1 % from a binding energy, on a circular orbit will have an eccentricity equal 0,1. If in the formula (10) to substitute (6), where $E_k = \frac{mV_\infty^2}{2}$, and also (4) and (5) and to take into account, that $\alpha = r_0 V_0$, where V_0 - orbital velocity on a circular orbit, we shall receive one more formula for an eccentricity of orbit of a captured body:

$$e = \frac{V_\infty}{V_0} \quad (11),$$

where: V_∞ - velocity of a body m in perpetuity,

V_0 - velocity of a body m on a circular orbit, which one it will take after full consumption of exuberant energy E_k .

Let's consider mechanism a capture and evolution of orbit of an captured body in more detail.

Let's suspect that the body is gone in a solar System with an eccentricity equal 1. On modern notions this body, pass the perihelion of orbit, will be deleted again in perpetuity and can not be captured. On notions of new physics such motion of a body is equivalent to "impact" with a solar System and recoil of a body back. Thus on a law of conservation of momentum the body will transmit a part of the impulse to a solar System as a whole and the back branch of a trajectory will represent any more parabola, and the ellipse, i.e. eccentricity of orbit will appear less than 1. Thus, the body will appear captured and, at each passage of a perihelion, it will transmit to a solar System of a portion of the exuberant energy so long as orbit of a body will not become circular. Apparently, that for this purpose the speed n around of the Sun should be infinite, since the transmitted portions all time decrease. Therefore system of energy levels of an captured body is very similar to a system of energy levels of atom (see chapter "Theory of a hydrogen-like atom"). The circular orbit in these cases is reached at $n \rightarrow \infty$. Here it is necessary to update, that the circular orbit can be reached neither in a hydrogen-like atom, nor in a space system. Therefore it is possible to speak only about some equilibrium orbit, close to circular, since in both cases the exited state arises at slightest effect at a system, as the levels of energy near to a circular orbit most are close set. In first case the atom is in an exited state even at temperature of absolute zero, and in the second case the exited state of space bodies is supported to constant by falling out on them of meteorites, comets and cosmic dust.

On a law of conservation of impulse:

$$mV_f = MV_M - mV_b \quad (12),$$

where: m - mass of a trapping body,

V_f - "exuberant" velocity m "forward",

V_b - "exuberant" velocity m "back",

M - Mass of an arresting body,

V_M - velocity gained M .

In (12) mass of the remaining terms of a system we leave out, otherwise under M it is necessary to understand total mass of a system.

The energy balance:

$$mV_f^2 = MV_M^2 + mV_b^2 \quad (13).$$

Deciding in unison (12) and (13), we shall discover:

$$V_b = V_f \frac{M - m}{M + m} \quad (14).$$

From (14): $V_1 = V_0 \frac{M - m}{M + m}$, $V_2 = V_1 \left(\frac{M - m}{M + m} \right) = V_0 \left(\frac{M - m}{M + m} \right)^2$ etc., therefore, for speed n the formula (14) starts a kind:

$$V_b = V_0 \left(\frac{M - m}{M + m} \right)^n \quad (15).$$

By substituting (15) in (11), we shall discover change of an eccentricity:

$$e = \left(\frac{M - m}{M + m} \right)^n \quad (16).$$

By addressing to the formula (20.1.6) [1], it is possible to explain to it as well by that the small masses lose less energy on each revolution and longer save a large eccentricity of orbit. The evolution of orbits of large masses happens much faster.

In (16) at $n=0$ (the capture still is not present) $e=1$, and at $n \rightarrow \infty$, $e \rightarrow 0$, since the fraction in (16) always is less 1.

The third Kepler's Law can be conversed to a kind:

$$T = \frac{T_0}{\sqrt{(1 - e^2)^3}} \quad (17),$$

where: T - period of rotation on elliptical orbit,

T_0 - period of rotation on a circular orbit,

e - eccentricity.

The energy loss of a body m on each revolution around of a central body M will make:

$$\Delta E = E_s \left[1 - \left(\frac{M - m}{M + m} \right)^2 \right] \quad (18),$$

where: E_s - "exuberant" energy of a body m .

Using the formulas (16) and (17) it is easy to count up evolution of orbit of a captured body. For a simplicity, masses of bodies we shall consider invariable for a period of evolution.

Moon. Before capture by the Earth, moon should have value α almost same, as for the Earth, that equilibrium radius of its orbit around of the Sun was close to earth radius. Moon before capture by a solar System could not have velocity of 30 kms/sec and $e=1$, since after passage of a perihelion, its eccentricity remain too large ($e=0.99999992614$) and first revolution around of the Sun it would commit 17.6 billions years. In this case capture of moon by the Earth is impossible, except for a random direct hit. The velocity of moon in perpetuity less than 30 kms/sec, for example 20 kms/sec is more interquartile. In this case orbit of moon in a solar System will have an initial eccentricity 0.667 with orbital period 2.4 years. In two opposite points on a line, perpendicular main axis of orbit and passing through center of the Sun, orbits of the Earth and moon will be intercrossed. Near to these points the capture of moon by the Earth is possible. Now equilibrium eccentricity of orbit of moon makes 0.0549 and average speed of orbital motion about 1 km/sec. Let's suspect that in a start of capture moon had the same velocity concerning the Earth, i.e. being moves to the Earth on a parabolic trajectory, moon after passage of pericentre will gain an elliptical trajectory around of the Earth with an eccentricity 0.9757. The period of the first revolution around of the Earth will make 7 years, on the second revolution the eccentricity of orbit will be diminished up to 0.952, and period till 2.6 years etc. The stable orbit close to modern will be reached for 120 revolutions and on it is required all about 25 years. Such fast evolution of orbit of moon is connected to its large mass concerning the Earth.

Earth. If to consider, that the Earth before capture had velocity of 30 kms/sec ($e=1$), after the first passage of a perihelion the eccentricity of its orbit will become equal 0.99999399, and the time of the first revolution after capture will be 24 million years. On the second revolution $e= 0.99998798$ and $T=8.5$ millions years etc. The equilibrium eccentricity of orbit will be reached for 800000 revolutions, approximately, behind 102 million years.

Considerable mass of a satellite in relation to a central body and considerable eccentricity of its orbit is necessary for check of set up views on evolution of orbits. In a solar System there are two candidates for check: a Mercury and Nereid (satellite of Neptune). An eccentricity of a Mercury 0.2056, and relation to mass of the Sun $1.66 \cdot 10^{-7}$, eccentricity of Nereid 0.75, and relation to mass of Neptune $3 \cdot 10^{-7}$. If to take into account, that on a

Mercury appreciable quantity of a space material should fall out, which one increments an equilibrium eccentricity of its orbit, the overseeing by orbit Nereid is more preferential.

Nereid. Under the literary data (E.N. Sluta etc. Comparative planetology. Moscow, "Science", 1995, page 88) radius Nereid 170 kms. Mass it is unknown, but, by accepting density 1.5 g/cm^3 , we shall discover $m=3.087 \cdot 10^{20} \text{ g}$. Mass of Neptune $102 \cdot 10^{27} \text{ g}$. If Nereid had a parabolic trajectory before capture by Neptune, for reaching an eccentricity 0.75 it should make 47550755 revolutions around of Neptune. Now orbital period of Nereid around of Neptune makes 8643.1 hours. The calculation displays, that with each revolution this period should decrease for 0.73 seconds.

The rather fast evolution of orbit is possible only for captured bodies, mass which one not less than 10^{-7} mass of a central body. The less massive bodies "recoil" from a central body practically without energy loss and the evolution of their orbit are stipulated by other reasons:

1. All bodies of a solar System are subject to activity of "solar wind". At motion on elliptical orbit towards to "solar wind" the loss of exuberant energy exceeds its entry at removal of a body from the Sun.
2. The exact same mechanism is acts at a body irradiation by photons which are radiated the Sun. At motion towards to the Sun the body immerses more short-wave photons, than at motion from the Sun.
3. The comets represent ice lumps from a water, ammonia and methane with "stuffing" from meteoroids. Therefore comets rather fast fail under activity of irradiation both tidal action of the Sun and their orbit rather fast evolved. In the total from comets there is a meteoric swarm, in which one the evolution of orbits of separate bodies depend on their mass.

In all these cases at each revolution around of the Sun the body loses a portion of exuberant energy, and its orbit comes nearer to circular.

1. The flow of protons of "solar wind" near to the Earth makes $\sim 2.5 \text{ protons/cm}^2 \cdot \text{sec}$, and velocity it 400 kms/sec (Physics of space. M., 1976, page 555-556). The asteroid of radius r , driving in neighborhoods of the Earth on elliptical orbit to the Sun will meet "solar wind" with velocity of 430 kms/sec, and at motion from the Sun - 370 kms/sec. The loss of an exuberant kinetic energy of an asteroid for one second will make:

$$N = S \frac{m_p}{2} (430^2 - 370^2) \cdot 10^6 \quad (19),$$

where: S - sectional area of an asteroid (m^2),

m_p - mass of protons falling in one second on 1m^2 of cross section of an asteroid (kg).

The full exuberant energy of an asteroid driving with an eccentricity equal 1 in neighborhoods of the Earth will make:

$$E = \frac{mV^2}{2} \quad (20),$$

where: m - mass of an asteroid (kg),

V - velocity of an asteroid (30000 m/sec).

Density of a material of an asteroid we shall accept equal 3000 kg/m^3 . By dividing (20) on (19), we shall discover time of full loss of exuberant energy of an asteroid. Thus it will be moves on a circular orbit. Here we do an appreciable error in calculations, since (19) depends on a position of an asteroid on orbit. The precise calculation is impossible, therefore it is necessary to consider the received below formula only as first approach:

$$T = 1.794 \cdot 10^{16} \cdot r \text{ (sec)} \quad (21).$$

The asteroid of radius 1 m under the formula (21) will take a circular orbit behind 568 millions years, and mote of radius 1 micron for 568 years. During existence of a solar System (5 billions years) to lose all exuberant energy at the expense of this effect the asteroids with radius less than 10 m could only. Therefore bodies of the greater size having a small eccentricity of orbit could be captured with rather small initial velocity.

2. In the chapter "Driving in vacuum the spectator, the source is immobile" the formulas for frequency of light are received perceived by the spectator, moved to a source:

$\nu_1 = \nu_0 \left(1 + \frac{V}{c}\right)$ and from a source: $\nu_2 = \nu_0 \left(1 - \frac{V}{c}\right)$. The difference of energies of photons

perceived by a space body, which one will be expended for decreasing of exuberant energy of this body will make:

$$\Delta E = \frac{2V}{c} h\nu_0 \quad (22).$$

The solar constant is peer 1400 watt/m² (Physics of space. M., 1976, page 551). If the space body is gone near to the Earth with parabolic velocity of 30 kms/sec, with the registration (21.22) on each revolution around of the Sun power of energy loss:

$$N = 0.28 \cdot \pi r^2 \text{ (watt)} \quad (23),$$

where r - radius of a body.

By dividing (20) on (23) we shall receive:

$$T = 2.04 \cdot 10^5 \cdot r \text{ (years)} \quad (24).$$

The formula (24) displays, that under activity of photon radiation of the Sun the evolution of orbit of a space body flow past much faster, than under activity of "solar wind". The same asteroid of radius 1 m will take a circular orbit not through 568 millions years, and in 204000 years.

The satellites of planets at motion on a circular orbit have not exuberant energy, but all the same permanently lose energy on the enunciated mechanism, since are moves that to the Sun, from the Sun therefore above-stated calculation for satellites of planets appears more precise. For example, moon will lose completely all energy of orbital motion (velocity of this motion of ~1 km/sec) for 11.8 billions years. Naturally, that it will fall on the Earth much earlier than full energy loss. Now becomes understandable, why for a Mercury and Venus are not present satellites, the energy loss in their neighborhoods so is significant, that the long-lived existence of a satellite is impossible. Moon exists as a satellite only at the expense of the huge sizes and rather recent captured by the Earth. For Mars and farther planets the solar constant is so small that the long-lived existence of satellites is becomes possible.

Now we shall look, as the enunciated new notions will be agreed practice of start of artificial satellites, i.e. with a inverse situation, when the body m does not approach with M , and is thrown out from it. It is known; see, for example, B.M. Javorsky, A.A. Detlaph. The manual on physics, "Science", M., 1964, page 79, that m has become a satellite M , it should be imparted the first solar escape velocity:

$$V_1 = \sqrt{\frac{GM}{R}} \quad (25),$$

where R - radius of a central body. For removal m in perpetuity it is necessary to impart the second solar escape velocity (parabolic):

$$V_2 = \sqrt{\frac{2GM}{R}} \quad (26).$$

On a surface of a central body, the body m has a potential energy of attraction $W_{att} = -\frac{GMm}{R}$. That m has appeared in a potential well on orbit around of a central body, is apparent (see of fig. 2), that is necessary to impart it a potential energy of a repulsion $\frac{mV^2}{2}$, equal half of potential energy of attraction:

$$\frac{mV^2}{2} = \frac{GMm}{2R} \quad (27).$$

Conversing (27), we shall receive (25). To throw out m on indefinitely large distance (second solar escape velocity), it is necessary to it to impart a potential energy of a repulsion, equal potential energies of attraction (that the common energy has become to equal zero point):

$$\frac{mV^2}{2} = \frac{GMm}{R} \quad (28).$$

From (28) we shall discover (26).

Thus, new physics, line up with official science concerning outbreak, about capture has opposite notions.

From (21.4) shall discover expression for α :

$$\alpha = \sqrt{GM r_0} \quad (29).$$

For a solar System (29) will look like:

$$\alpha = 1.152 \cdot 10^{13} \sqrt{r_0} \text{ cm}^2/\text{sec} \quad (30).$$

The relation α to integers (quantumness of values α) is shown on a figure 3.

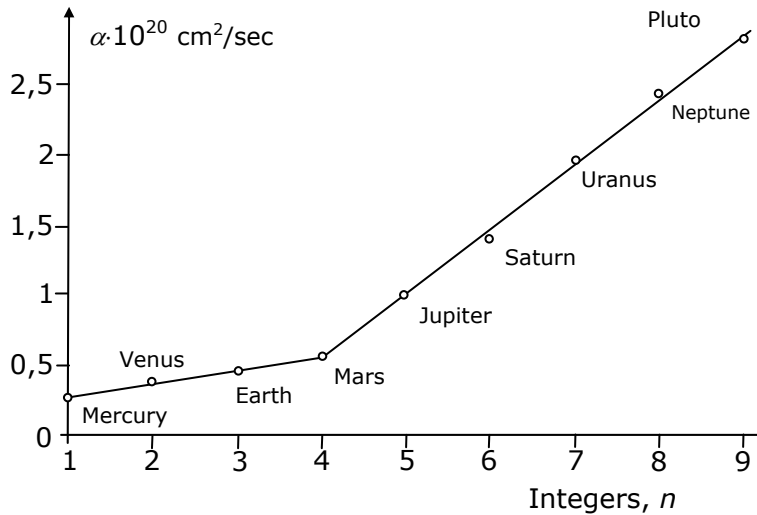


Fig. 3

It is easy to show, that all planets and satellites in a solar System moves with the first solar escape velocity relevant to radius of their orbit. For this purpose, for example, we shall substitute value $\alpha = V \cdot r$ in (4) and we shall receive (25). Allowing (25) also that $r = r_0 \cdot n^2$, is easy to receive a ratio: $V = \frac{V_0}{n}$, which one displays, that the orbital velocity of planets or satellites of "earth" group or "jupiter" of group decreases in process of removal from a central body in an integer of times concerning velocity in the first quantum condition. Decreasing of centrifugal velocity of an electron at radiation of photons and formation of atom also in an integer of times (the formula (13.15) [1]) indicates not only the family ties electrostatic and gravitational fields, but also on scale independence of their activity, i.e. generality of the laws macro and microcosm.

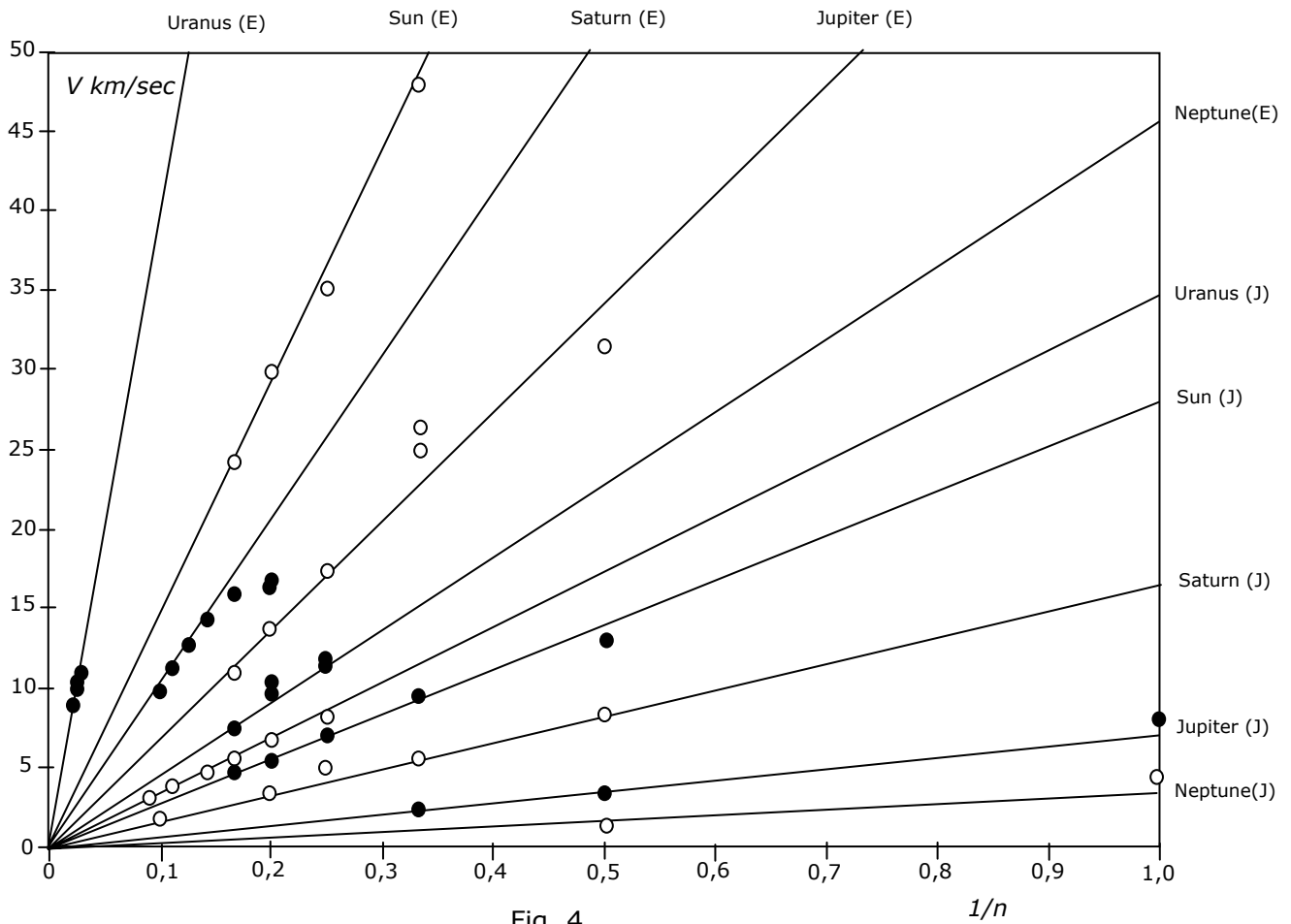


Fig. 4

On a figure 4 points mark orbital velocities of planets of a solar System and their satellites (under the data: E.N. Sluta etc. Comparative planetology, M. "Science", 1995) depending on reverse value of their quantum number. On the basis of above-stated, each group of satellites should lie on a straight line; the tangent of a slope angle numerically is peer by which one of an orbital velocity of the term of this group the first quantum condition, i.e. V_0 . The straight lines are held on earlier received values α_0 and r_0 for each group, by dividing one on another. As it is visible, apparent velocities of space bodies it is good "lie down" on straight lines. Near to straight lines the title of groups, for example is indicated: the sun(E) - Earth group of planets, and Jupiter(J) - satellites of Jupiter "jupiter" of group.

It is interesting to consider numerical values V_0 :

Planet	V_0 km/sec	Planet	V_0 km/sec
Neptune (J)	3.53	Neptune (E)	45.39
Jupiter (J)	7.12	Jupiter (E)	68.13
Saturn (J)	16.52	Saturn (E)	101.92
Sun (J)	27.80	Sun (E)	146.14
Uranus (J)	34.69	Uranus (E)	380.5

V_0 "jupiter" and "earth" groups though correspond each other, but is unexpected in any way correspond with masses of their hosts. To be disassembled with this interesting phenomenon shall put values of quantum numbers:

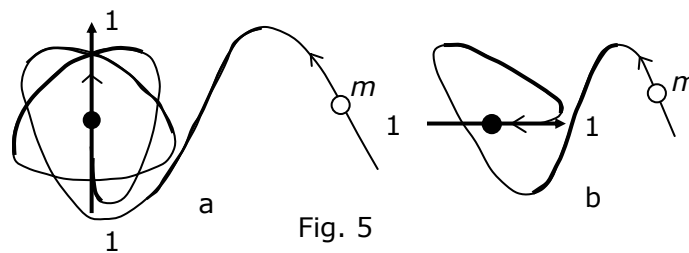
Planet	"jupiter"	"earth"
Neptune	1,2	4,5,6
Jupiter	1,2,3	2,3,4,5,6
Sun	2,3,4,5,6	3,4,5,6
Saturn	2,3,4,5,10	5,6,7,8,9,10
Uranus	4,5,6,7,9,11	35,36,37,38,39,40,41,42,43

Except for the Sun, the large quantum conditions correspond large V_0 , but on fig. 4 maxima on a distribution curve of large comets and asteroids are traced down to a quantum

number 10 for Earth group (vertical thin arrows), and the quantum numbers of Jupiter group are quite possible up to values, large 10 for yet not unclosed "planets". In this case Sun in a list will move below than Saturn and the sequence completely will correspond to sequence for V_0 . To add in the Sun in this list it is not absolutely correct, but the justifying can be served by deep reliance of the unified mechanism of formation of space systems.

The absence of a correlation between mass of central space bodies and V_0 of their satellite systems is additional affirming that the solar System (as well as other sidereal systems) was formed at the expense of affixing of planets already having almost off-the shelf satellite systems. They were shaped in interstellar medium in different conditions of relative velocities of a central body and flying by its potential satellites. If their velocity is rather great to form a system the satellites with large values of a quantum number (as for Uranus) can only, if this velocity is small, the system will be formed predominantly by bodies with low values of a quantum number (as for Neptune). Apparently, that the last case is more interquartile, therefore low values of quantum numbers most frequently meet. Therefore all bodies of a solar System having large quantum numbers (for example, comet with a large eccentricity), for sure arrived to us from apart, instead of from the proximate interstellar environment of the Sun. It brightly demonstrates to us Uranus with the satellite system. A phenomenon of Uranus to explain from orthodox stands practically it is impossible.

The reverse rotation of a satellite or planet demonstrates its capture practically in the whole kind. There is it as follows (fig. 21.5 as "from above" on a plane of a solar System 1-1):



The left-handed body m in a direction of arrow is gone counter-clockwise. Its own rotation happens in the same side, and the rotation axis is parallel an axis of a screw trajectory of a body. After capture of a body, its orbit evolves so that the direction of the gravodynamic orbital moment has coincided with by the gravodynamic moment of a solar System as a whole. As the rotation axis of a body saves the position in space, at the end of evolution of orbit the body m will be moves in a plane of an ecliptic in a straight direction, but the rotation around of a own axis will be the reverse. During evolution of orbit we shall watch at first large eccentricity and large orbit inclination to a plane of an ecliptic. Such parameters we see for Pluto, therefore, it rather recently is captured by a solar System. Gradually these values decrease, but the rotating axis of a body is saved in space; therefore captured bodies with reverse rotation are characterized by a large inclination of equator to orbital plane. This angle depends on an angle between an axis of a screw trajectory of a body before capture and plane of a solar System. If this angle is close to 90° (fig. 5a), an inclination of equator will be close to 180° , as for Venus. If this angle is close to 0° (fig. 5b), the inclination of equator to orbital plane will close to 90° and the body on orbit will to be moves "lying edgewise", as Uranus. Thus, the reverse rotation of planets or satellites indicates capture of these bodies bodily. The circumvolution of numerous satellites of Uranus in its equatorial plane in one side especially visually displays, that Uranus was captured together with a own satellite system formed in interstellar space.

Let's compare enunciated notions to the observation data on loss on the Earth of meteors. If the meteoroid is captured by a solar System from interstellar medium with zero initial velocity, it will be moves (at the end) on a circular orbit around of the Sun. If radius of orbit corresponds earth, the traveling speed on orbit of this body will make, as well as for the Earth, about 30 kms/sec. In a straight direction on this orbit the overwhelming majority of meteoroids and only minor quantity - in an opposite direction will be moves. Apparently, that the traveling speed of meteors to the Earth after will be zero, and towards 60 kms/sec. Apparently also, that the traveling speed of meteors in interstellar medium near to neighborhoods of a solar System can not in accuracy equal traveling speeds of the Sun on

galactic orbit (250 kms/sec), i.e. they have some initial velocity before capture. "As the solar System is gone of rather interstellar medium with velocity of 20-25 kms/sec..." E.N. Sluta etc., Comparative planetology, "Science", M., 1995, page 17.

We can find what maximum relative velocity should be for an interstellar meteor, that it was captured, for example, on Earth orbit. For this purpose we shall equate its kinetic energy of a binding energy under the formula (5):

$$\frac{mV^2}{2} \leq \frac{G^2 M^2 m}{2\alpha^2} = \frac{GMm}{2r_E} \quad (31),$$

where r_E - radius of orbit of the Earth.

From (12):

$$V \leq \sqrt{\frac{GM}{r_E}} \quad (32).$$

The formula (32) displays, that into given orbit the interstellar meteor having initial velocity no more orbital (30 kms/sec for Earth orbit) can be capture which one sums up with orbital. In this case orbit of a meteor will be elliptical with an eccentricity close to unit, if in (32) to accept a sign of equality. Thus, the velocity of drop on the Earth of meteors already to belonging (captured) Solar System varies from 0 up to 30 kms/sec, if meteors moves in a straight direction and from 30 up to 60 kms/sec, if they moves backwards (towards to the Earth). If their velocity exceeds 60 kms/sec, the similar meteors, depending on their velocity, can be captured into orbit of Venus, of Mercury or hypothetical circum-solar planets in 1 or 2 quantum conditions or their capture is absolutely impossible. For earth group of planets radius of orbit of the first quantum condition is peer $0.6213 \cdot 10^{12}$ cm. Substituting this value in (32), we shall discover $V=146$ kms/sec. In a straight direction these meteors will be moves in high layers of atmosphere with velocity of 146 kms/sec, and in backward with velocity of 176 kms/sec. It is necessary to consider similar meteors as the transit travellers, as they are not capable to capture and it is necessary to consider falling out them on the Earth as random "direct hit".

It is clear, that transit meteors is an extremely infrequent case, since their relative velocity is comparable to absolute speed of the Sun, i.e. they are the visitors any more not interstellar, and intergalactic medium. The above-stated reasoning are completely confirmed by observations.

"Wippl has notified about measurements of velocities 144 meteors. 15 of these meteors had velocities slightly more than 42 kms/sec... From 144 meteors observed by Wippl, in one case it is impossible to consider demonstrated existence even as one really of hyperbolic orbit". O. Struve etc., Elementary astronomy, M., 1966, page 188.

"Incidentally same meteor shower has enabled Hey, Parsons and Stewart for the first time to determine velocities of meteors on hyperbolic reflections (radar method - V.K.). They have received value of 22.9 kms/sec, that will be well agreed with determined of visual observations by value of 23.7 kms/sec.

Among 11000 meteors recorded within 847 clocks of observations since December, 1948 till March, 1950, the MacKinly has found only 32 meteors, the velocities which one concerning the Earth slightly exceeded 72 kms/sec". Ibidem, page 190.

The falling out of meteorites on the Earth in a plane of an ecliptic "outside", from a direction, opposite from The Sun, west-to-east, i.e. after to motion and rotation of the Earth is most possible. As the earth's spin axis is inclined to this plane bevel way 23.5° that depending from season, the falling out of meteorites is most possible in a band of width from Southern tropic up to Northern tropic. In this connection is of interest a hypothesis expressed by my higher son about ancient planetary catastrophe as a result of drop on the Earth of a space body of the huge sizes in region of the Philippine sea (near to Northern tropic when in northern hemisphere there was a winter). In result (see, for example, the Small atlas of a world, M., 1998, page 188-189) on the Earth was formed grandiose an impact crater of radius of the order of 10000 kms enveloping practically half of terrestrial globe. The edges of a crater have formed Cordilleras in Northern America, the East-Pacific raising, South-Pacific rising, Australian-Antarctic raising and ridge Kergelen is East-Indian ridge. In a direction, opposite to shock, crust creased with formation of mountain systems Himalayas, Tibet, Tien-Shan and mountain ridges of Eastern Siberia. At the bottom of crater (the large part of Pacific Ocean) was formed a system of radial faults: Mendosino, Pioneer, Merrey, Clarion, Clipperton, Paskhy, Eltanin, and also radially directional systems of pacific

islands. All impact area has become since then region of seismic and volcanic activity. It is doubtless, that the wreckagees of earth rocks at this shock have got not only on moon, but also on Mars.

In summary this chapter is necessary to consider practically relevant problem of stability of orbital motion of artificial satellites of the Earth. This problem because of huge costs of their manufacturing and start is topical. Apparently, that for maintenance of long-lived and reliable operation of an artificial satellite, its orbit and orbital motion should be "natural", i.e. the satellite should be in one of quantum states, orbit should lie in a plane of an ecliptic, the motion should be to direct, and satellite (or its part) to be gyrated in the side of motion. All these requirements simultaneously it is impossible to satisfy, but to be aimed to this it is necessary, if not we want to lose a satellite "on unknowns to the causes".

References:

- 1 <http://www.new-physics.narod.ru>