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ANTIGRAVITY AND GRAVIFUGAL LEVITATION

1 ANTIGRAVITY

basis for discussion and polemics.

Is it possible to produce // create the antigravitational force, to levitate, or to rid oneself of the effects of gravitation?

This is a question that has plagued the non-scientific and, to a degree, the scientific world for centuries. Presented here are a few brief views of the issue which have become crystallized during the course of my research of this, mostly non-scientific, sphere of human interest.

What is antigravitation?

Expressed in the simplest of terms, it should be some kind of force which would oppose gravitation, annul it and make possible the levitation of bodies.

For physicists, antigravitation is a nonsense, since no such mass exists which could repel another mass, prevent the spread of gravitation or, like Verne's *Cavorite*, isolate a body from its influence. According to understanding available to date, this cannot be achieved – either by way of anti-matter or by some field.

For SF writers antigravitation and levitation are very desirable, but also so fantastic that their achievement and use by man are regarded as impossible, that even authors of this field are not too keen to write about those things, and they rarely do so.

For various “inventors” antigravitation is, just as it is for constructors of a *perpetuum mobile*, a possibility of achieving fame by constructing some kind of anti-gravitational flying craft.

Meditative levitation

A large number of people, scientists included, believe that levitation can be achieved only through meditation. They are of the opinion that only the spirit can be so powerful to make a body levitate. This was supposedly confirmed by the levitation of Father Giuseppe from Copertino in the 15th century, of St. Teresa of Ávila, of Sri Aurobind and numerous other yogis. There are many people today who are doing their best to achieve levitation in some such manner – either by meditation or through will power – in the belief they would thus attain a kind of divine state and a divine level of existence. One can often see yogis and their disciples on TV hopping around in a sitting position and declaring that to be levitation.

However, if we - without prejudices and illusions - think about such meditative levitation, and what would be achieved by it, we would see the following:

If one's spirit would become capable of raising and lifting a physical weight, or rather the body in which it resides, but also various other objects, it is hardly likely that the human spirit, even if it were to achieve that kind of levitation, would be content with its new task, and indeed regard it as a divine achievement. This is a task that once, long time ago, was performed by slaves, horses and donkeys, and today by cranes, trucks, trains, etc.. So much for meditative levitation.

Antigravitational devices

A fundamental and very often painfully confirmed human experience is that physical bodies are heavy and that they tend to fall. The experience of weight and falling has been confirmed so many times that it is inadvertently identified with the sense and internal logic of things themselves. The falling of material objects is simply something that is understandable, logical, "normal".

It is on that premise that one very interesting, unconscious or, at best, semi-conscious "conclusion", or to be more precise, a fantastic nimbleness of thought has been achieved:

If falling is something logical and understandable // meaningful, then something which is meaningless is not going to fall.

This nimbleness of thought became a "theoretical", or rather psychological, basis for a large number of "antigravitational devices" to be found on the Internet. The best known "projects" of this kind are those by T.T. Brown, J. Searl, de Palma, Modanese, E. Podkletnov, Ning Li, Robert L. Forward and numerous other authors. There are thousands of them. The characteristic common to those devices is that the internal movement of their parts and forces they have at their disposal are arranged totally ineffectually, non-functionally, or in complete disregard of the laws of physics, indeed of absurd relations.

"Explanations" provided with the projects of those devices usually suggest that they are something revolutionary and new.

These "explanations" also are based on a subconscious assumption, whereby that which has no any links to science and laws of nature is, by its very nature, absolutely superior to science and the products of its application.

It is not known whether any of those devices ever actually levitated. True, J. Searls did claim that he produced one such very large device, but was unable to present it to the public because it "escaped into space", and he did not possess the necessary funds to build another one. And so it was that, due to his bad luck, mankind was deprived of one precious testimony.

But here are few encouraging and comforting words.

NASA has for some time been spending significant sums on experiments with the device invented by E. Podkletnov...!!!???

???, !!!.

But it is not the last word of this story. At the November 1. 2006. US Patent Office granted patent to Boris Volfson for “invention” which is in the same time nevertheless than perpetualmotion machine and antigravitational space ship!!!!???

!!!???

I am not dogmatist, but it is also to much for one ultrarevolutionary scientist.

Levitation – paradox of all paradoxes!

I have already stated that it is a generally accepted opinion whereby everything corporeal is also heavy, and that it inevitably falls – a rule which, by some inner logic of things themselves, applies to the entire material universe.

Let us see if that is indeed so.

Astronauts and their space ships, for instance, levitate in relation to the Earth. The Moon also levitates in relation to the Earth. The Earth levitates in relation to the Sun. The Sun levitates in relation to other stars and the centre of the galaxy. Atoms levitate in relation to one another, electrons levitate in relation to atomic nuclei, nucleons are levitating in relation to one another, and so it goes on, **ad infinitum**.

The entire universe levitates within itself.

The state of levitation, and not of weight and falling, should be our **true** experience founded on science. Our **actual** (ordinary and erroneous) experience – one of weight and falling – has been acquired within a very narrow belt of the Universe where, through a chance combination of specific circumstances, things are heavy, and they do fall. This, our, **essentially incomplete** experience, we have generalized and applied to the entire Universe. And that was the fatal mistake, since the Universe is actually weightless; indeed, if it were not levitating within itself it could not survive // maintenance itself.

And so, people have for centuries been unsuccessfully searching for at least one reliable, unquestionable case of levitation, failing to notice that it is going on all around them all the time!!!???

Now, is that not a paradox of all paradoxes?

Gravifugal force

However, this all-pervading levitation is not based on anti-gravitation but on **gravifugal** force. **Gravifugal force** is a reaction to the effect of the **gravipetal force**, and gravipetal force is in fact gravitation acting as a centripetal force. According to the law of action and reaction, gravifugal force acts in a direction opposite to that of gravipetal force, i.e. of gravitation – and consequently, it annuls it.

Astronauts orbiting the Earth at a speed of c. 7.9 km/sec, levitate because they develop a **gravifugal** force, which is equal to **gravipetal** force (gravitation). (Those who some like to refer to as “ordinary folk” think that astronauts levitate because “up there” there is no gravitation). Geo-stationary satellites also levitate above a certain point on the Equator due to the gravifugal force generated by their orbiting around the Earth at a velocity of c. 3.05 km/sec. (The **angular velocity** of their orbit equals to that of the Earth). The velocity of Moon’s orbit around the Earth is only 1.002 km/sec., but the gravifugal force it develops is sufficient to neutralize Earth's gravitation, enabling it to levitate. The Earth levitates in relation to the Sun also on the basis of the gravifugal force resulting from its orbiting the Sun at a velocity of 30 km/sec., etc. etc.

The entire Universe describes some kind of orbiting motion, and its levitation is based on the balance of gravifugal and gravipetal forces. If gravipetal force were to become dominant, the Universe would cave in upon itself, while the dominance of the gravifugal force would result in its break-up and dispersal – like a discus revolving too fast.

So, from the time to time, we must carried out copernicusian revolutions if we want to understand how the things are standing.

But lets us take a look at something else, something that is of practical importance to man.

Theoretical foundation for a gravifugal flying craft

The velocity of Earth's rotation at the equator is 464 m/sec. This develops a gravifugal acceleration of 0.034 m/sec.^2 , and consequently objects lose 0.34 % of their weight. At the geographic latitude of 45° , where Earth's velocity is 338 m/sec., gravifugal force is also smaller, and therefore objects lose 0.17% of their weight. At latitude of 70° , where Earth's velocity is still smaller, objects lose only 0.035% of their weight. At the poles the linear velocity of the Earth is zero, and consequently, the gravifugal force also equals zero. There, objects do not lose any of their weight. I have mentioned the above values only because they have been confirmed through numerous measurements and can be found in a text books of Geophysics. *There, the fact of crucial importance is that objects also lose weight when outside the rotational plane, which means that gravifugal force also acts outside*

the rotational plane – but not in a form of derivative of geocentrifugal force. Search for Hideo Hayasaka experiments.

This fact is important because it demonstrates that it is indeed possible to build a gravifugal flying craft.

In order to clarify this problem it can be assumed that each parallel on Earth is in fact a solid ring whose velocity we can alter. With a change in velocity, v , the value of gravifugal force, $F_{gf} = mv^2/R$, will also change. But let us assume just that at the North Pole we have only one massive, strong ring 10 m in radius, whose rotational axis was, e.g., coaxial with Earth's axis. If we were to accelerate that ring to a velocity of 7.9 km/sec. it would lose its entire weight, and it would levitate. However, such a ring would not levitate only at the poles, but anywhere on Earth – providing it was rotating at a velocity of 7.9 km/sec. And if we could give it higher velocity, it could carry a casing and some load. Theoretical and experimental proof for this can be found on the Internet page:

<http://www.geocities.com/agravity/ANTIGRAVITY.htm>

Search also for Hideo Hayasaka experiments carried out by high velocity spinning gyroscopes. Due to lack of gravifugal explanation, The Hayasaka's results were regarded as an errors in measurements.

Gravifugal flying craft

That would therefore be a solution for some future “anti-gravitational”, i.e. gravifugal, flying craft, because levitation of gravifugal flying craft is based on a large and fast rotating ring.

Up until now it has not been possible to build such a craft for these two reasons: 1. *due to the misconception that gravifugal force produced by Earths rotation is **only a derivative of geocentrifugal force**, the value of which should always (regardless of velocity) be equal to zero, just like in a case of rotation of solid body and*

2. because until the discovery of nano-tubes no such material existed which would withstand the high rotational velocities necessary to make elevation and levitation possible.

In the not too distant future, when and if nano-tubes become affordable, it will be possible to build a commercial flying craft with two types of ring: **mechanical and quantum-rings**. The propulsion energy used to accelerate and elevate the ring will be electricity; electric batteries will discharge and electric energy would be transformed into the kinetic energy of the ring. In order to land the craft the ring will have to decelerate and its kinetic energy will return to electric energy which will be stored in batteries.

Since the velocity of light is constant, c , **quantum-ring** - ring made by pure light – at the crafts fitted by a such ring, will not be possible to change the velocity of ring, than only **quantity** of the light.

One flying craft will be able to lift off at least ten times a day into orbit, and return, at negligible cost. Transport costs of a visit to certain celestial bodies – the Moon or the planets – would not be any greater.

Bearing in mind that a gravifugal flying craft would not be expensive, and would be easily manageable, it is highly likely that in the not too distant a future, thousands of families would be able to take to their crafts each weekend and go sightseeing on the Moon.

Given below is the presentation of the quantum-ring flying craft. See the fig. 11. at:
How does it function?

Electric energy from battery 9. is, through light source 3., transformed into light 2. and inserted into toroidal tube 1, with mirror-smooth walls. Light reflects from those walls and circles around the toroidal tube without the possibility “of being extinguished”, i.e. to disappear. Once a sufficient quantity of light has been inserted into the tube the craft begins to elevate. To land the craft it is necessary to insert transparent photo-electric elements 4. into tube 1. Light passes through them, is transformed back to electric energy and once again stored in batteries.

The theoretical basis for a flying craft with a quantum-ring, as well as its experimental confirmation, was provided by Lord Edington during his investigation of some of the tenets contained in Einstein's General Theory of Relativity. The passage of ray of starlight near the Sun (during an eclipse) has shown a deviation from the direction of movement, but it also demonstrated that light possesses a certain degree of inertia. It is this very inertia which enables the quantum-ring in a gravitational field to behave just like a mechanical ring, i.e. to develop a gravifugal force which, in fact, is nothing other than a manifestation of inertia.

Gravifugal civilization

But here is another, **ostensibly** fantastic aspect:

Readers who are familiar with the way the Law of conservation of energy functions will understand that a gravifugal flying craft would be performing no physical activity (work) if it were levitating at a constant altitude of, for instance, 2, 3, or 4 km, or any other. And if it were not performing any physical activity (similar to a geo-stationary satellite), it would not be consuming energy. A well-built craft with rings which would also be powerful permanent magnets, enclosed within an evacuated casing, would therefore levitate at a certain height for thousands of years without consuming any, or almost any,

energy. Such a craft would be suitable for living, and many of them together for the formation of a levitating town or island. I do believe that the entire civilization of the future will levitate in Earth's atmosphere and in the universe surrounding it, and that is going to be a mature form of material civilization of mankind.

Just as all parts of the universe are levitating in relation to other parts, so should – it seems – **mature, fully developed** material civilization be levitating in relation to Earth. After all, we have seen that levitation is the true, real way of survival or selfmaintenance of the material universe, and there would be nothing strange in it if that were the true manner of survival of material civilization.

As far as man is concerned, life in such a civilization would be much more convenient, healthier and safer than on the humid and muddy surface of our planet, which provides ideal conditions for viruses, bacteria, insects and other forms of living creatures, but not for a creative form like mankind. Speaking from a subjective, human outlook, Earth is a very beautiful and generous planet. But we shall be able to fully experience this beauty and generosity only when we are enjoying them from the safety and comfort of our gravifugal homes which will, like clouds, be ferried by air currents all around the Earth.

2 LEVITATION

Phenomenon of levitation in general

Physical levitation appears when some body does not react to the action of an attracting force. Absence of necessary reactions are:

1. absence of acceleration toward the point of application of attracting force, or
2. absence of weight – which can be caused by simultaneous action of some repellent force, or by particular (circular) movement of levitating body in a field of an attracting force.

(There are also some opinions claiming that levitation can be caused by some spiritual force. More about it at the end of this text.)

Physical levitation is always levitating, hovering, or floating in relation to something, or in regard to something - in regard to magnet, or body with electrostatic charge; in regard to surface of Earth or some other celestial body.

Real and apparent levitation

It is necessary to different **real** and **apparent** levitation. Real levitation is in fact permanent weightless state.- state in which body lose or have lost its weight. All other cases of levitation, in which the body retain entire its weight are cases of apparent levitation.

Cases of apparent levitation

are: magnetic levitation, diamagnetic, electrostatic, aerodynamic and some others. In these cases, or kinds of levitation it is achieved by repelling of magnet poles or electrostatic charges, or by repelling from air. In all these cases, the levitating bodies (by the means of invisible magnetic or electric field, or air), by entire its weight, are pressing, the surface above the which they are levitating. Apparent levitation is very usefull. It is used in many ways in contemporary technology: magnet bearings, maglev trains, hovercrafts etc.etc. But these kinds of levitation are efficacious and economical, only at a very small distances – from several milimeters to several decimeters.

All cases of apparent levitation are divided in two kinds: 1. levitation in which is necessary to consume energy to maintain the state of levitation. 2. Levitation in which is not necessary to consume energy. Levitating of helicopters and hovercrafts belong to the first kind. Magnetic levitation, diamagnetic and similar, based in repellent forces arising from magnetic or electrostatic fields, belong to the 2nd kind. This 2nd kind of levitation is much more economic.

Real levitation,

As just was stated, is in fact permanent weightless state. It was achieved by circular, i.e. orbital movement in Earths gravitational field. Eg. Levitation of astronauts in their spaceships. In the mentioned kind of movement, gravity functions as an attracting, centripetal force – force curving the trajectory of the moving bodies (eg. Satelites) into circular shape (arround the celestial body). Mass of the body react, i.e. resist to the changing of its line of motion. (Gallileo: Law of inerty and Newton 3 Law of equality of the action and reaction.) Consequence of that resistance, i.e. inertia of the mass of body - at the velocity 7, 9km/sec.- is permanent weightless state – the real levitation. Inertia of body mass manifests itself as a centrifugal force. Centrifugal force is a reaction to the centripetal force action. (Newton, 3).

Permanent weightless state, i.e. real levitation is, therefore consequence of equality of centripetal and centrifugal force. During that levitation, bodies are losing only its weight, but not its mass neither inertia. This kind of levitation is functional and efficacious also at a very large distances.

Permanent real levitation achieved by using centrifugal force, i.e. by orbiting Earth, is necessary to maintain satelites in its orbit, but it is very bad for human health. However, in despite of it, this kind of levitation is the most important kind of levitation to human species.

To maintain a state of real levitation is not necessary to consume any energy. Artificial or natural satelites are able to levitate in regard to some celestial body even bilion years, without any energy consumation. Eg. levitating of the Moon in regard to Earth or Earth in regard to Sun. Good examples of that phenomenon are also geostationary satelites. Energy must be consumed only to achieve velocity of satelization and to achieve certain orbit. Because of this property, real levitation is extraordinary economic means for realizing some vital goals of human species.

Equation which serves to find the **velocity of levitation**, v_l is as follow:

$$v_l = \sqrt{GM/R} ,$$

where The G is gravitational constant, M is mass of Earth and R is a radius, i.e. distance of satellite from the center of gravity of Earth.

Velocity of levitation is in fact the velocity of satellisation, vs.

In a lowest Earths orbits it is cca 7,9km/sec. In a higher orbits, this velocity is lesser. Geostationary satellites are levitating above the certain point at the equator orbiting the Earth by velocity cca 3,05km/sec. Its angular velocity is equal to that of Earth. Moon is levitating in relation to Earth on a base of orbital velocity of 1,002km/sec., around the Earth. Earth is levitating in regard to Sun on a base of the velocity of 30km/sec., around the Sun.

As just was stated, Earth is in weightless state and levitate in regard to Sun. The people and things on Earths surface too. But the people and things on Earths surface are not in weightless state and are not levitating in regard to Earth.

Important note. Temporary weightless state can be achieved by an aircraft moving in a parabolic trajectory and free falling chamber, but only for a short time. Weightless state achieved in a such way is not levitation, because it is not possible to say that the free falling body is a levitating body. Phenomenon of levitation excludes falling down.

Therefore, every case of weightless state is not a levitation, and every levitation need not to be weightless state.

Gravifugal levitation

In all previously mentioned cases of levitation, in which gravity functions as a centripetal force, instead of terms centripetal and centrifugal, it is better to use terms gravipetal and gravifugal. Gravifugal force is a reaction to the gravipetal force action. Gravipetal force - as just was stated - is nothing but gravity functioning as a centripetal force. Eg. weightless state of astronauts, is a case of gravifugal levitation, as well as, eg. levitation of the Earth in regard to Sun and others. Speaking by these terms, gravifugal levitation, which is a kind of **real levitation**, is a consequence of equality and cancelling out of gravifugal and gravipetal force. See:

Difference between the gravity and gravipetal force is not only in its names or terms, than rather in its very nature and mathematical expressions by which is possible to find its values. Expression for the value of gravity, F is:

$$F = GMm/R^2 ,$$

and for value of gravipetal force:

$$F_{gp} = GMm/R^2 - mv^2/R$$

Mathematical expression for value of centripetal and centrifugal force (at the rotation of solid body) is:

$$F = mv^2/r$$

G is the gravitational constant, M is a mass of celestial body, m is a mass of observed rotating body, R is a distance from rotating body to center of eg. Earth, v is velocity of rotating observed body and r is radius of rotating solid body.

Electrofugal levitation

is also real levitation. Electron orbiting atom nuclei is in a weightless state in regard to that nuclei – in a state of levitation. Weightless state of electron is based in equality and canceling out the centripetal and electrofugal force.

Magnetofugal and **nucleofugal** levitation. also are kinds of real levitation.

Inevitability of new terms

Using the new terminology, it is possible to differentiate various kinds of levitation: magnetic, magnetofugal, electrostatic, electrofugal, gravifugal etc. etc. Furthermore, it enables us to differentiate exactly, scientifically the real and apparent levitation and also define it. In a lack of term «gravifugal», the most important kind of levitation to human race existed without proper name.

Causes of real levitation

Real levitation is achieved by opposing the inertia of body to some attracting (fundamental) force, functioning as a centripetal force (gravipetal, centripetal ...etc.). We are opposing it by circular motion of body and certain velocity around the point of application of attracting (centripetal) force. Circular movement increases an inertia and it pulls the mass in opposite direction of that of gravity action.

Important note. Only by opposing a body inertia to the eg. gravitational attracting force, it is possible to prevent, or stop the gravitational acceleration of body in such way that it can arrive to permanent weightless state, i.e. becomes to levitate.

Causes of an apparent levitation

If we, however, prevent gravitational acceleration of that body by force arising from magnetic or electrostatic field, the body starts to float, or levitate above some magnet pole or electrostatic charge. As just was stated, during the apparent levitation, the levitating bodies are retaining its weight.

Although, at the first glance, the weight seems to be property of body, it is in fact manifestation of an attracting force in a case of prevented

acceleration. Every force, in a case of opposing to the force of gravity, can make the body to be heavy. (Except in a cases in which those forces are appearing as centrifugal forces arising from circular movement and body inertia) Force which causes an apparent levitation, (eg. Electricity or magnetism), however, in the same time, causes also the weight of body, even, in the same way as any solid surface on which body can stand or lie.

Kinds of real levitation

Here are the forces able to function as an attracting, centripetal force: Terms «centripetal» and «centrifugal» are just denominations of direction of force actioning - towards to centre, or away from it.

Force..... centripet. dir.....Centrifug. dir....cosnsquence

Gravity.....gravipetal.....gravifugal.....levitation in regard to celestial body

Electricity.....electropetal.....electrofugal.....levitation in regard to atom nuclei

Nuclear f.....nucleopetal.....nucleofugal.....in regard to nucleon or atom nuclei

Magnetism.....magnetopetal.....magnetofugal.....in regard to one magnetic pole.

Solidity..... solidopetal.....solidofugal.....here is no levitation.

Levitation can appear only if one of fundamental forces functions as centripetal force.

Solidity, which enables solid body to rotate, is declared as an apparent force or pseudoforce. Solidofugal force can cause only mechanical stress in the matter of the rotating solid body.

Differences between solidofugal and gravifugal force

In a case of rotation of solid body value of solidofugal force is always equal to that of solidopetal, and proportional to the velocity of rotation. Newton 3. In a case of rotation of, eg.: artificial statelite, in which gravity acts as centripetal (i. e gravipetal) force, gravifugal force also is equal to that of gravipetal, but the both forces are inversely proportional to the value of satelites velocity. It is key factor enabling the real levitation. If we, for example, increase velocity of satelite, than - by very that act - we will not increase its gravifugal force, than rather radius, R of its movement (orbiting).

Bearing in mind that, increasing the radius of orbiting, we are exponentially, (per R²) decreasing value of gravipetal force, make us

able to understand why higher orbits needs lower velocity of levitation, vs. (See text above)

Antigravitational levitation – yet not found – up today exist **just as wish**. On a base of contemporary physics is not possible to understand internal structure or real base of that **wish**. Also it is not possible to understand or imagine how to create antigravitational force, field, or so called shield. No one attempt to create antigravitational device, field or shield, was demonstrated as sucesfull.

Meditative, volitive and paranormal or spiritual levitation – also seems to be **only wish**, up today. There is no any solid proof of personal levitation.

Human needs to leave the surface of Earth, to wisit other celestial bodies, or to live in the space is possible to realize by **using gravifugal force and gravifugal levitation**. In other papers I have shown that it is possible to use **this kind of levitation** and gravifugal force in a quite different and muhc more economic manner than is this that was used in astronautical practice up to now. See article talking abuot gravifugal flying craft:

GRAVIFUGAL FLYING CRAFT

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PART I

Definition of the Gravifugal Force

Dear visitor, sorry having to say: **antigravity does not exist.** Fortunately, instead of it, there is, a **gravifugal force**. This force is real, experimentally proved, and something much better and much more suitable and useful than so called antigravity.

When speaking about the *gravifugal force* we in fact refer to a certain sort of centrifugal force created by *rotation in which gravity acts as centripetal (i.e. gravipetal) force*. Direction of the *gravifugal* force is always opposite to that of the gravipetal (gravity). This concept of *gravifugal* force is based on Newton's understanding of gravity as an attracting force, on the law of action and reaction, and the law of inertia, and has been deduced from them by means of the mathematical tools provided by the Huygens' theory of the centrifugal force.

Centripetal and Centrifugal Forces

Designations "centripetal" and "centrifugal" do not denominate any special forces, but rather *directions in which a particular force acts during a rotational process* -- towards the centre or away from it, or rather, towards the axis of rotation or away from it. Any of the known forces may be centripetal in direction, that is to say, perform the function of the centripetal force.

The following table lists all centripetal and centrifugal forces

Designation of special forces	Centripetal forces	Centrifugal forces
Gravity Electricity Magnetism Nuclear force <i>Cohesion</i>	Gravipetal force Electropetal force Magnetopetal force Nucleopetal force <i>Cohesipetal force</i>	Gravifugal force Electrofugal force Magnetofugal force Nucleofugal force <i>Cohesifugal force</i>
Fundamental forces	Function	Reaction: Pseudo-forces

The above table clearly shows that the function of the centripetal force is performed by fundamental forces, with the exception of the cohesive force; hence its slight separation from the others. This force also can be called **solidity**, and consequently, in a case of rotation, **solidopetal** and **solidofugal** force.

Centripetal, Axipetal, and Axilongal Forces

In regard to the **direction of action** it is also important to differentiate between *axipetal* and *centripetal* forces. Axipetal force is directed toward the *axis* of rotation, and the centripetal toward the *gravity centre* of the rotating celestial body.

Particularly, I want to draw attention to the *axilongal* force - the one acting *along the axis* of rotation. This force can be caused *exclusively* by the rotation of a celestial body, or by the rotation of a disc or ring within a gravitational field.

Specific Features of the Rotating Mass of Celestial Bodies

First and foremost, it must be pointed out that the cohesipetal force - solidity - which enables a solid body to rotate without being dispersed is not a fundamental force but an inertial, pseudo-force. Differences in the after-effects of rotation of solid body (with regard to the rotation of a celestial body) result from the fact that rotation of celestial bodies is made possible by the fundamental, gravipetal force. It is of utmost importance.

Let us observe **Figures 1a and 1b** which show forces that result from the rotation of a steel sphere (**1a**) and the forces created by the rotation of a spherical celestial body (**1b**). Lines of the cohesipetal force resulted from the rotation of a steel sphere are perpendicular to the rotation axis and at the same time are parallel to one another, and since they are directed **toward the rotation axis** they are designated as lines of the axipetal force. Lines of the gravipetal force are directed to **a single point in the centre** of a celestial body, while the gravifugal force F_{gf} spreads **radially** from that point -- the point of application of force.

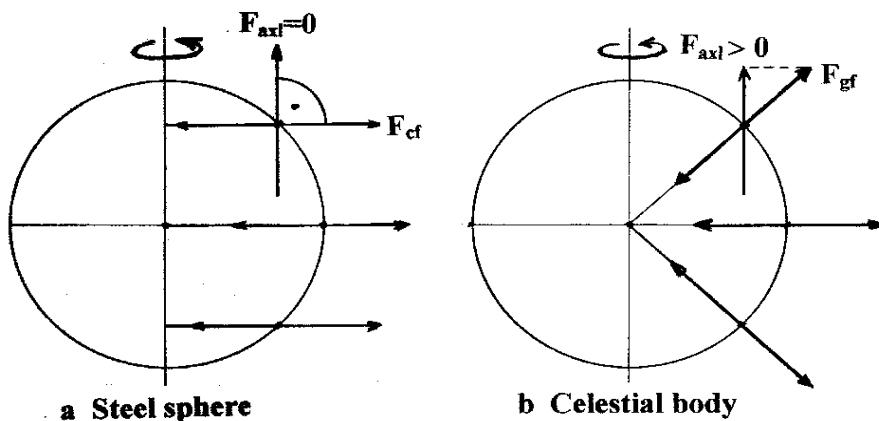


Figure 1 a and 1 b

In the case of the **steel sphere**, force F_{axl} (axilongal force), active in the direction that is parallel to the rotation axis, will equal zero for two independent reasons:

1. In accordance with the laws of symmetry, the force directed upward from the plane of rotation equals the force directed downward so consequently, the two cancel each other out.
2. We can arrive at the value of the force parallel to the rotation axis by multiplying either the cohesifugal or the cohesipetal force by $\cos 90^\circ$, which equals zero. Bearing in mind that $\cos 90^\circ = 0$, the force parallel to the rotation axis, i.e. the force active in the direction, F_{axl} , will equal zero regardless of the velocity at which a ring or some other mass may rotate.

However, the very fact that gravipetal and gravifugal forces (**Fig. 1b**) spread in a different manner from cohesipetal and cohesifugal forces (**Fig. 1a**) indicates that where the rotation of a celestial body is concerned, the axilongal force, F_{axl} could exceed zero value. This in turn means that the concept of the gravifugal flying craft is not a pointless one, since the rotation of a ring rotating in the vicinity of some celestial body would create the axilongal force, F_{axl} the value of which would be proportional to the rotation velocity, v of the ring.

Vectorial Analysis of a Rotating Mass at the Geographical Latitude $\varphi = 45^\circ$

a) First Group of Facts -- Values of the Gravifugal and Gravipetal Forces

Rotation of the mass of a celestial body at its equator is determined by only one force: gravipetal force, F_{gp} , while rotation at latitudes greater than zero requires an additional force: cohesipetal force F_{cp} (**Fig. 2**). This force is always perpendicular to the direction of both the gravipetal and gravifugal forces. Its function is to maintain the observed mass on a parallel the radius of which is smaller than the radius of its equator. Cohesipetal force, F_{cp} is in fact a mechanical tension (tension of the solid body material) directed toward a

designated point on the rotation axis of celestial body which is, in fact, the point of application of the cohesipetal force.

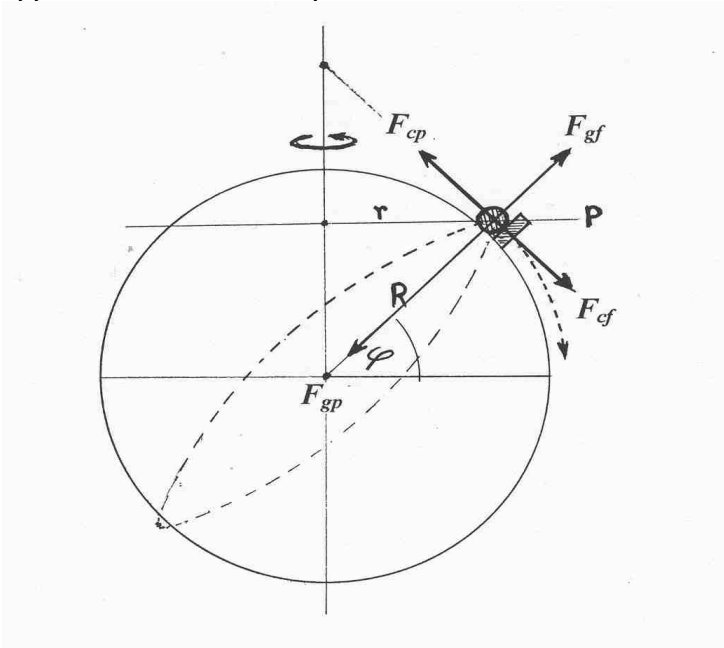


Figure 2

If there were no cohesipetal force, an observer standing on Earth (and rotating with it) would notice that the observed mass is accelerating toward the equator, i.e. in the direction of the cohesifugal force F_{cf} . This potential trajectory is marked by the curved dotted line culminating in an arrowhead. The component known as the “horizontal component of geocentrifugal, (i. e. of geoaxifugal) force” is in fact nothing more than the cohesifugal force F_{cf} . To a stationary observer in space recording the trajectory of the observed mass this trajectory would appear to be circular -- designated as an ellipse (dotted line) in Fig. 2.

(The cohesipetal force appearing in connection with rotating celestial bodies is ultimately a derivative of the gravitational force. This can be observed directly in rotating gaseous bodies, i.e. those without solid crust. However, this is neither the place nor the time to go into a detailed explanation of this phenomenon.)

The expression for the value of the gravifugal force is ; $F_{gf} = \frac{m \cdot v^2}{R}$, and for

the value of cohesifugal force it is $F_{cf} = \frac{mv^2 \cdot \sin \varphi}{R \cdot \cos \varphi}$

b) Second Group of Facts -- Relative Value of the Gravipetal Force

Figure 3 is a representation of rotation of the observed mass at $\varphi = 45^\circ$. Let us first assume that an observed celestial body is not rotating, in which case the only force existing there would be gravity. If that were the case, the observed mass would exert pressure on the surface of the celestial body of $F_g = 9,81 N$. There is no rotation and no symmetry in relation to the rotational plane P.

Now let us assume that the linear velocity of the mass equals the velocity of satellisation: c. 7900 m/s. At that velocity and at the given geographical latitude $\varphi = 45^\circ$ all four forces determining the rotation of the observed mass -- the forces of the inner circle -- would be equal: c. 9.81 N. It is clearly visible that they are symmetrical in relation to the rotational plane, but the weight of the observed mass, or rather the pressure it exerts upon the surface of the celestial body, has fallen to zero.

Let us further assume that the rotational velocity of a celestial body could be considerably increased, and together with it the velocity of the observed mass, and let us observe the

behaviour of the forces (after such increase in velocity). The outer circle represents the area of increased speed and the limit to which the observed forces have increased.

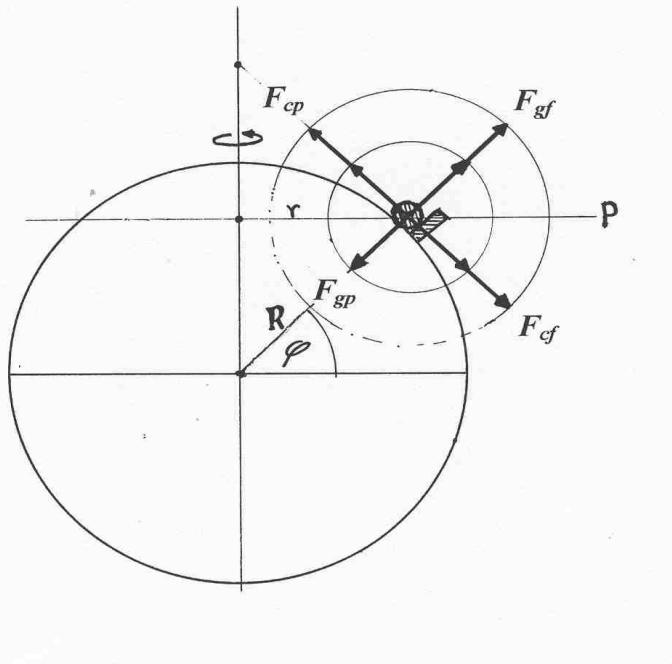


Figure 3

Our observation will tell us that the only forces to have increased would be pseudo-forces: cohesipetal, cohesifugal, and gravifugal. This is logical and, indeed, essential, since the value of these forces depends on the factor v^2 / R , i.e. it is proportional to velocity v and inversely proportional to the value of radius R .

The fourth force, gravipetal force F_{gp} , has not increased. This is a fundamental force and its *absolute* value is determined by the

expression $\frac{GMm}{R^2}$, and it existed prior to rotation, which was not the

case with the other three *pseudo*-forces. The *relative* value of the gravipetal force is inversely proportional to the rotational velocity of the celestial body, i.e. to the velocity of the observed mass. This *relative* value of the gravipetal force, F_{gp} is defined by the expression

$\frac{GMm}{R^2} - \frac{mv^2}{R}$. The greater is the value of pseudo-forces or rather,

the higher is the rotational velocity of a celestial body, the lower is the *relative* value of the gravipetal force.

At this juncture I should point out that the value of the gravifugal force cannot exceed the absolute value of the gravipetal force (gravity) since that would contradict Newton’s Law of action and reaction. When the velocity of the observed mass exceeds the velocity of satelisation v_s it is not the value of the gravifugal force which increases, but rather the observed mass must increase the radius R of its trajectory, i.e. the distance from the centre of the celestial body -- that is to say, from the point of application, or source of the gravipetal force. In fact, the observed mass must lift off the surface -- in other words, *it starts to levitate*.

The most important observation at this point is following: Gravifugal force *tends* to violent symmetry or equality among the forces in relation to rotational plane, P. The vector sum of the forces at the “upper” side of the plane P *tends* to be greater than the sum of the forces at its “lower” side. This means that the observed mass (in order to maintenance equality of action and reaction forces), will accelerate in the direction of the gravifugal force action, F_{gf} and increase the radius R of its movement. This reaction will decrease the value of gravifugal force.

The ring of the gravifugal flying craft, to be discussed later in this text, behaves in exactly the same manner.

Important differences

In a case of rotation of solid body, at which the centripetal force is performed by **pseudoforce** (solidity or cohesion) centripetal and centrifugal (i.e. cohesipetal and cohesifugal) forces increases itself proportionally with velocity of rotation, up to destruction of solid body. At the rotation of celestial body or any other rotation in which the centripetal force is performed by some **fundamental** force, centripetal and centrifugal forces are **decreasing** by enlargement of velocity of rotation, and are **inversely proportional to that velocity**.

At the first, this phenomena appears as a **decreasing of weight** of observed mass, and after acheivement of velocity of satelisation, as an **increasing of radius R**. As I just stated, this is a way of maintenance of the phenomenon of equality of action and reaction forces, described by Newtons law 2.

Decreasing of weight was proven by gravimetrical measurement, and increasing of radius R by flight of arificial satelites.

c) Third Group of Facts -- the Value of the Axilongal Force F_{axl}

However, vital to the requirements of the gravifugal flying craft is the value of acceleration in the direction of the axilongal force F_{axl} . **Figure 4** will assist us in determining the value of that acceleration.

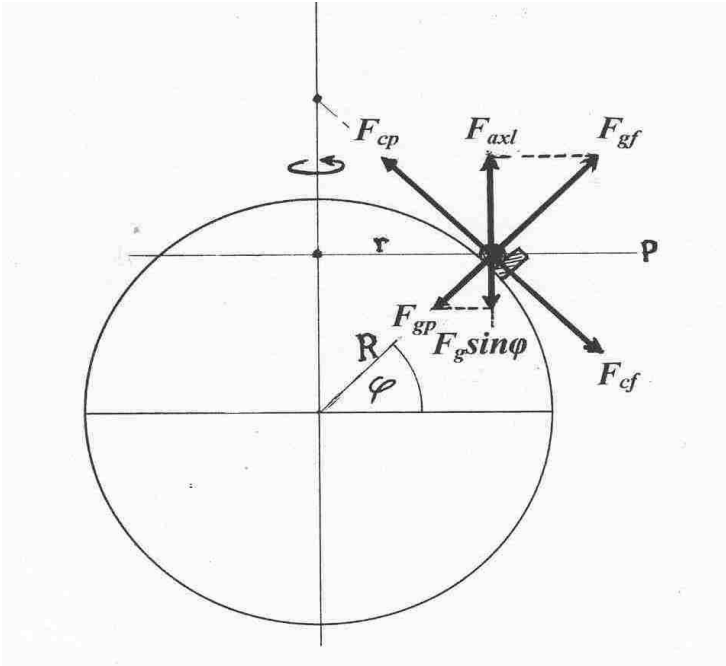


Figure 4

Velocity of the observed mass is considerably greater than the velocity of satelisation.

The value of the axilongal force F_{axl} is arrived at by multiplying the cohesipetal force F_{cp} by $\cos\varphi$ and the gravifugal force F_{gf} by $\sin\varphi$, and then by adding the two results. From the obtained total we deduct the value of the cohesifugal force F_{cf} , multiplied by $\cos\varphi$.

$$F_{axl} = F_{cp} \cdot \cos\varphi + F_{gf} \sin\varphi - F_{cf} \cos\varphi$$

$$F_{axl} = \frac{mv^2 \cdot \sin\varphi \cdot \cos\varphi}{R \cos\varphi} + \frac{mv^2 \cdot \sin\varphi}{R} - \frac{mv^2 \cdot \sin\varphi \cdot \cos\varphi}{R \cos\varphi}$$

$$F_{axl} = \frac{mv^2 \cdot \sin \varphi}{R} + \frac{mv^2 \cdot \sin \varphi}{R} - \frac{mv^2 \cdot \sin \varphi}{R}$$

$$F_{axl} = \frac{mv^2 \sin \varphi}{R}$$

The value of the axilongal force is therefore proportional to the rotational velocity v , to the sinus of the angle φ , and inversely proportional to the motion radius of the observed mass R , i.e. to the distance from the centre of the celestial body.

$F_{axl} = 0$ only in three cases: a) $v = 0$, b) $R = \infty$, and c) $\sin \varphi = 0$ ($\sin \varphi = 0$ is only at the Equator). $R \text{ also} = \infty$ only at the equator.

If we want to know a velocity maintaining in equilibrium F_{axl} and derivative of gravitational force $F_g \sin \varphi$, we can get it by equation: $v = \sqrt{\frac{GMm}{R \sin \varphi}}$. Values achieved by this equation are in quite accordance with establish knowledge and experience

Warning

In order to achieve correct understanding of this phenomenon, at this point, we must repeat once again our statement from previous chapter.

“When the velocity of the observed mass exceeds the velocity of satelisation v_s , it is not the value of the axilongal force which increases, but rather the observed mass is increasing the radius R of its trajectory, i.e. the distance from the centre of the celestial body. In fact, the observed mass must lift off the surface i.e. *it starts to levitate*”

“It is a way of maintenance of the phenomenon of equality of action and reaction forces, described by Newtons law 2.”

List and equations of forces

Given below is the list of all forces as well as the list of equations giving their values.

Gravitational, $F_g = GMm / R^2$

Gravipetal, $F_{gp} = GMm / R^2 - mv^2 / R$ **or** $GMm / R^2 - m\omega^2 R \cos^2 \varphi$

Gravifugal, $F_{gf} = mv^2 / R$ **or** $m\omega^2 R \cos \varphi$

Cohesipetal, $F_{cp} = mv^2 \sin \varphi / R \cos \varphi$ **or** $m\omega^2 R \cos \varphi \sin \varphi$

Cohesifugal, $F_{cf} = mv^2 \sin \varphi / R \cos \varphi$ **or** $m\omega^2 R \cos \varphi \sin \varphi$

Axipetal, $F_{axp} = mv^2 / R \cos \varphi$ **or** $m\omega^2 R \cos \varphi$

Axifugal, $F_{axf} = mv^2 R \cos \varphi$ **or** $m\omega^2 R \cos \varphi$

Axilongal $F_{axl} = mv^2 \sin \varphi / R$ **or** $m\omega^2 R \cos^2 \varphi \sin \varphi$

Figure 5 depicts all those forces graphically

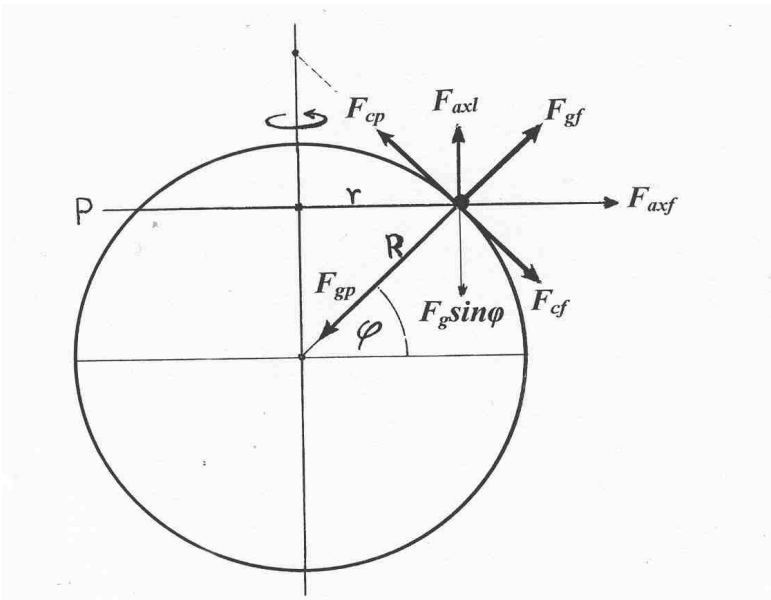


Figure 5

Double-Curved Trajectory of the Ring Mass (The first key part of the theory)

In an effort to make things as simple and clear as possible, thereby making the problem easier to understand, I ask the reader to imagine a rotating ring (as shown in Figure 6) at some moderately high latitude.

If we wanted to present the motion of the ring mass through Euclidean geometry we should take into consideration, above all, the fact that every particle of the ring mass on the way from point A to point F is always at equal distance from the centre of the celestial body. It is assumed, of course, that the axis of rotation of the ring is identical, or co-axial to the direction of action of gravity. If the trajectory of the ring mass from point A to point F is projected onto a plane we shall obtain a symmetrically curved line (part of a circle) since all points are at equal distance from the centre only within a circle. From the projected trajectory it is easier to understand why the rotation of the ring must necessarily cause the *gravifugal* force F_{gf} .

By the way of clarification, during rotation of the ring its mass is continually “falling” or veering toward the centre of the celestial body (point of application of the gravipetal force). ***The trajectory of the ring mass is simultaneously curved toward the centre of the ring and the centre of the celestial body.*** The curvature toward the ring centre is visible to the naked eye, whereas the curvature toward the centre of the celestial body can be understood only on the basis of a knowledge of spherical geometry and the correct method of arriving at conclusions.

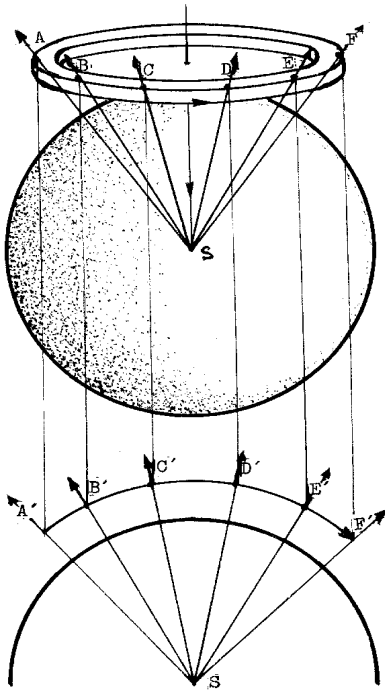


Figure 6

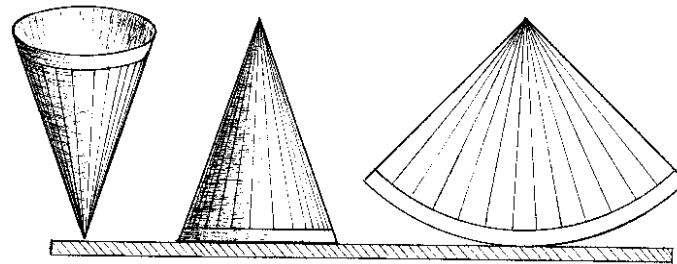


Figure 7

In order to make it quite clear, I would now like to give an elementary explanation of the above claims whereby the trajectory of any particle in the ring mass is not straight but curved, in other words, it veers constantly toward the centre of the celestial body. I would ask the patient reader to make a paper cone and then to draw lines on its outer surface that would extend from the base to the point (**Figure 7**). Now place the cone base down on a table or any flat horizontal surface. We shall see that the edge of the base touches the flat surface at all points, thus giving the impression of being as flat as the surface upon which it rests. However, when we open the mantle of the cone and spread it out we shall see that it is not flat at all, but spherical, circular (i.e. curved) and that each point on its edge is removed from the former top of the cone by the same distance.

Just as this edge veers constantly toward the former top of the cone, so do the particles of the mass of the rotating ring constantly veer toward the centre of the celestial body forming a curved, circular trajectory. It is difficult to perceive that the edge of the base is curved toward the top of the cone unless the cone mantle is opened and spread out. Similar difficulty is encountered in observing the real form of the trajectory followed by the particles of the ring mass. At first glance no one would venture to say they veer constantly toward the centre of the celestial body (say, Earth). The mass of the ring *resists this veering* toward the centre of the celestial body, i.e. *it resists the change in direction of its motion*. The consequence of this resistance, i.e. of inertia, is the *gravifugal force*, F_{gf} . The direction of its effect is marked by arrows on Figure 7.

Experimental proofs (The second key part of the theory)

Experimental proof of the existence of the gravifugal force can be found in gravimetrical tables in every text-book of geophysics. Measured values of the gravifugal force or acceleration are in absolute accordance with the values calculated on the basis of the expression v^2 / R .

$\Delta g \varphi = F_{gf}$ plus the decrease in veight cause by flatness of Earth

$F_{gf} = \Delta g \varphi$ minus the decrease in veight caused by flatness of Earth

Gravimeter is measuring **gravifugal** force too. Every point on every parallel on Earth (every geo. lat.) we can regard as point of mass of rotating ring presented at **fig. 6** and **8**.

Experimental proof of the existence of the axilongal force can be found in tables of navigation by gyrocompass. Every gyrocompass is provided with tables of “error of geographical latitude” (slight declination toward East). This “error” remains unexplained till today. I have explained it by the influence of the axilongal force. Now it is possible to calculate the “error of geographical latitude” by the following equation:

$$\tan \theta = F_{axl} / F_I$$

Angle θ is the value of “error”; F_I is the force caused by the gyroscopical inertia (of the gyrocompass rotor).

Application of the Presented Principles on the rotation of ring of the Gravifugal Flying Craft Ring

The gravifugal flying craft is a device in which a large-diameter ring rotates at high velocity. The rotation axis would always be co-axial with the direction of action of the gravitational force. See Fig. 8. The craft would lift off and levitate by means of the force resulting from the rotation of the ring, and would be active along the rotation axis. I have designated this force as the “axilongal force”. Axilongal force is, as already explained above, a derivative of the gravifugal force,

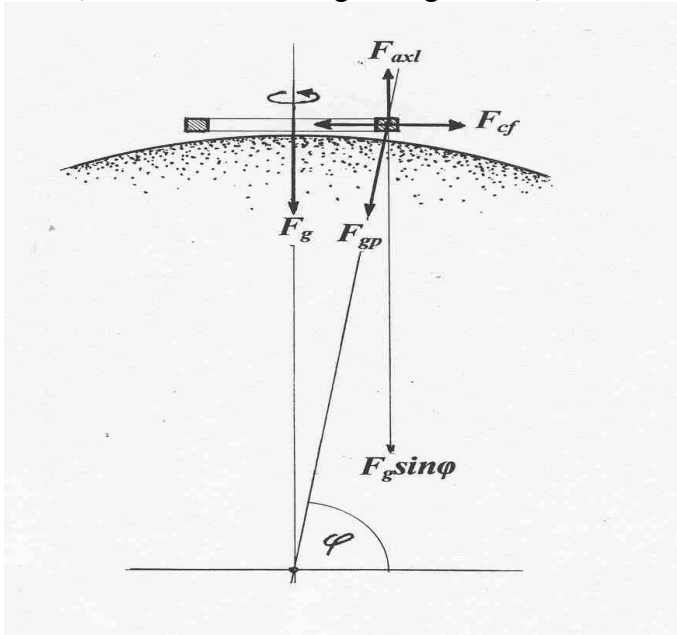


Figure 8

The ring of the gravifugal flying craft would have a radius from 1 to, for instance, 20 metres. It would be the same as if a certain mass were revolving round the polar axis at a distance of a mere 10 metres, which corresponds to the geographical latitude of $\varphi = 89.9999102^\circ$. The sinus of that angle is practically 1, and on that basis the equation for the value of the axilongal force could be as follows: $F_{axl} = mv^2 / R$, and for the value of the resulting force or acceleration it could be: $g - v^2 / R$.

At the velocity of 7900 m/s the ring of the gravifugal flying craft should levitate, and at velocities above that value it could lift a casing enclosing it. A ring of sufficient strength should be able to carry a flying craft bearing a useful load.

Behaviour of gravifugal Flying Craft and Its Accordance with Energy Conservation Law

Astronautical experience has confirmed the theory that the higher an artificial satellite flies, or rather, the greater is its distance R from the centre of the Earth, The lower must be its velocity. This is an inevitable consequence of the Law of conservation of energy: $E = K + U$. The greater is the height h of an artificial satellite, i.e. the longer is the radius R of its orbit round the centre of the Earth, the greater is its potential energy $U = mgh$,

and consequently, the lower is its kinetic energy $K = mv^2 / 2$ which is in turn lessened by the reduction in the velocity v of the satellite. Energy conservation law is also valid in case of the gravifugal flying craft.

Kinetic energy of its ring is calculated by equation $K = \omega^2 I / 2$ and its potential energy by equation. $U = m_{fc} gh$

$$\frac{\omega^2 I}{2} = m_{fc} gh, \quad \omega^2 I = 2m_{fc} gh. \quad \text{Factor } g = \frac{GM}{R^2}, \text{ then we can write}$$

$$\omega^2 I = 2m_{fc} \frac{GM}{R^2} h. \quad \text{Since the factor } h \text{ is in fact radius } R, \text{ they cancel each other}$$

$$\text{out, and we write } \omega^2 I = \frac{2GMm_{fc}}{R}, \quad R\omega^2 I = 2GMm_{fc}, \quad \omega^2 = \frac{2GMm_{fc}}{RI}$$

$$\omega = \sqrt{\frac{2GMm_{fc}}{RI}}$$

ω is the angular velocity of the ring, I is the momentum of inertia of the ring, m_{fc} is the total mass of the gravifugal flying craft, including also the ring mass, h , height is radius R i.e. distance from the centre of Earth.

The last equation clearly shows that behaviour of the gravifugal flying craft is in accordance with the energy conservation law. The larger the radius R and its potential energy, the lower is its kinetic energy i.e. angular velocity, ω of its the ring.

Attention !

This is very important information.

Ring made in strongest non-expensive materials of today - several kinds of carbon fiber – enables us to decrease the weight of ring only per max. cca 6%.

Only **nano-tubes** has sufficient tensile strength power which enables gravifugal flying craft to levitate.

The strongest metal rings or gyroscopes are capable to decrease weight of ring or gyroscope only per cca 0,0005 % Tensile strength of different metals are very low. Density is, unfortunately to large.

That is why no one of many scientific laboratories (dealt with metal gyroscopes) could not achieve considerable values in decreasing of weight of gyroscopes. They achieved cca 0,000002 % to 0,000004%. Achieved values are mainly regarded as an errors in measurements.

By a ring made in carbon fiber is possible to achieve considerable and non-disputable values.

Nano-tubes are very expensive today. We hope its price will decrease soon. In a such case, also non-professionals could make small gravifugal flying craft.

PART II - GRAVIFUGAL FLYING CRAFTS

Small, Experimental Gravifugal Flying Craft

Figure 9 1 is mass of the ring made by carbon fiber or nano-tubes; 2 are magnetes of permanent magnet bearing (ring or rotor); 3 magnetes of permanent magnet bearing of casing or stator; 4 aluminum mass of the ring; 5 electromagnetes made by high frequency electromagnetic core and coils – powered by 3-phase electric current; 6 mass of the casing made by carbon-fiber or polyester mass.

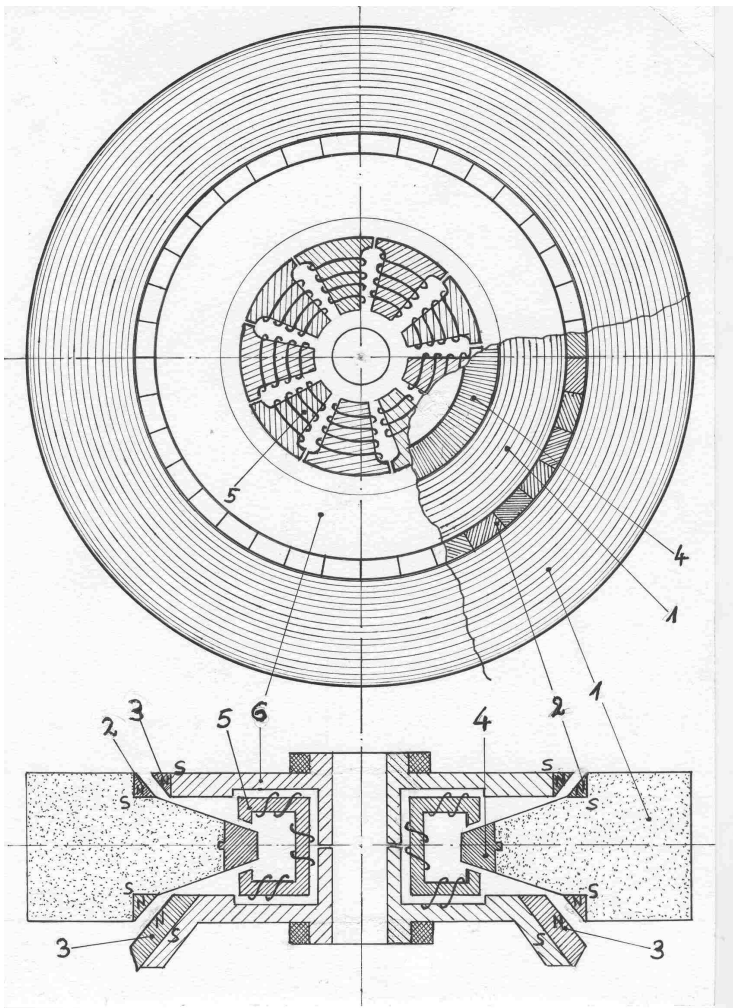


Figure 9

Coils are powered by 3-phase electric current. They are mounted in such a way as to allow creation of a revolving magnetic field. By linking the coils into the electric circuit an opposing magnetic field is also induced in the aluminum ring mass. Due to the effect of the magnetic field the ring begins to turn in the same direction as the magnetic field of the casing. The velocity of the ring is dependent on the velocity of rotation of the casing magnetic field, while the rotation velocity of the magnetic field is dependent on the frequency of the electric power (alternating).

If you are using only **minimal number of poles** (9 electromagnetic poles casing, powered by 3-phase electric current), and want only to put **ring (made of nano-tubes)** into gravifugal levitation, you should to provide frequency of 22,2 kHz. This frequency could able ring to rotate at cca 8000m/sec and levitate. If you want just to decrease weight of **ring** in a value of e.g. 3%, you should provide frequency of 6kHz.

Average diameter of the ring let be 1,2m. The ring has no firm axis. It is floating in the magnetic field. The magnetic field made by permanent magnetes serves as a frictionless magnetic bearing – maglev system

If a flying craft with an aluminium ring were to be fitted with a battery of 50 Ah capacity that could feed electric energy reliably to the device for at least 2.5 hours (i.e. 9000 seconds) and if electricity from a domestic power supply were used to accelerate the ring up to the moment it is able to ensure vertical acceleration of the flying craft of **only 0.1 m/sec²** (in order to avoid air resistance in the lower strata of the atmosphere), and if the craft begins to use power from its own battery only after it peels away from the launching lawn, then an **average** acceleration of the craft at least 2.3 m/sec², after 9000 seconds, can be relied upon. According to the formula

$$l = \frac{at^2}{2} = \frac{2,3 \cdot 9000^2}{2}$$

the flying craft will reach the distance, l of 93,150 km, which is one-quarter of the distance to the Moon. According to the formula for calculation of the ultimate speed: $v = at = 2.3 \times 9000$ it will move away from Earth at the speed of 20,700 m/sec. If the craft is launched 60 minutes before sunrise it will travel into the endless Universe at the speed of 50,700 m/sec (including the speed of Earth -- 30,000 m/sec).

Attention

The ring becomes to decrease its weight only when its velocity exceed the linear velocity of Earth at your experimenting place, i.e. at your geographical latitude. E. g. velocity of Earth at geo. lat. 30° is cca 400m/sec. and at geo. lat. 45° is 338m/sec.

We said that every craft must be fitted by two counter-rotating rings. Among the mentioned reasons, there is still one: counter-rotating rings prevents reactive counter-rotating whole craft.

In this article there is not diagram of device with counter-rotating rings. **Sorry.**

Rings must have equal dimensions and equal mass, also must be accelerated by equal accelerations. The rings could be situated one under the other.

Large gravifugal Flying Craft Fitted with Rings that are Permanent Magnets

In order to demonstrate just how economical gravifugal propulsion can be, on the following pages I shall give a presentation of the construction and utilisation of a gravifugal flying craft using large permanent magnet bearings. These are, in fact, two steel magnetic rings positioned so that facing poles repel each other. The bottom, rotating, ring creates the gravifugal force while the top, stationary, ring acts as the bearing for the rotating ring. See **Fig. 10**

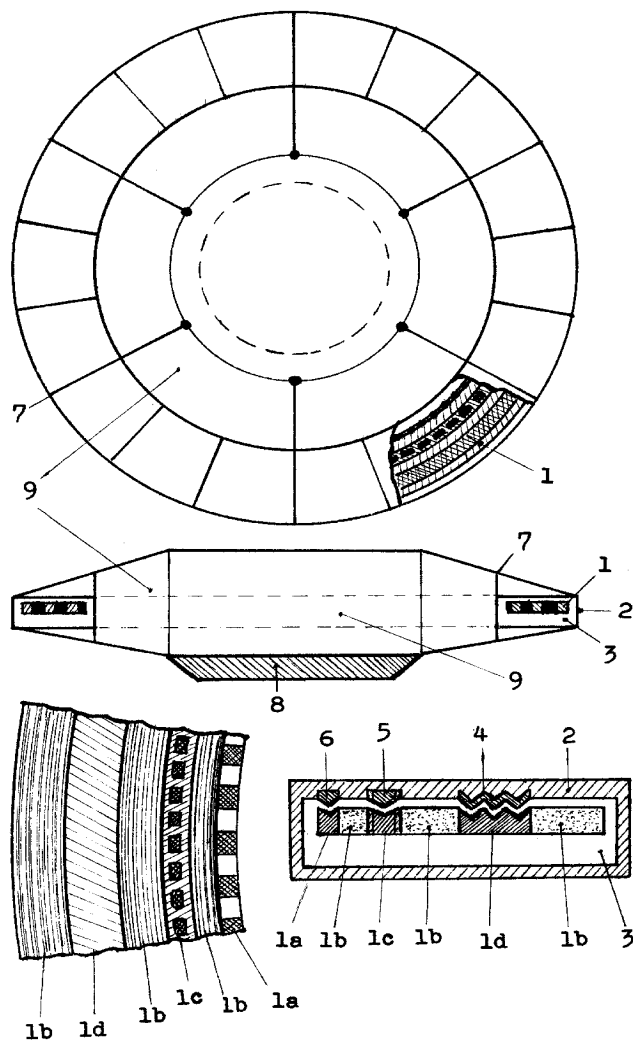


Figure 10

Fig. 10 1 - the entire rotating ring (rotor); 1a - permanent magnets used to decelerate the ring; 1b - layer of nano-tubes; 1c - metal, diamagnetic mass of the ring; 1d - permanent magnet (ring) which propels the flying craft; 2 - casing wall; 3 - evacuated casing area; 4 - stationary magnetic ring; 5 - electromagnets which accelerate and decelerate the ring; 6 - coils of electromagnets; 7 - structure of the flying craft with carbon fibre or aluminium; 8 - electric batteries; 9 - useful area.

The advantage of such a flying craft in comparison with the one described at the following pages lies in the fact that it consumes no energy when constantly hovering at any given altitude, the hovering being ensured by the remanent magnetism of the rotating and static rings, i.e. their repellent force. Should altitude be reduced, the kinetic energy of the ring rotation would be transformed back into electric energy by means of permanent magnets (1a) and coils (6) and stored in batteries. The electric energy would, of course, also be used for the horizontal acceleration and deceleration. But for horizontal movement can be used and some kind of energy, or fuel.

Bearing in mind that when hovering at any given altitude, these craft would consume no energy, they would be suitable for use as floating family homes, hotels, hospitals, industrial plants, observatories, etc. Floating platforms of this type could be positioned at any altitude above the equator, and also above the poles. Main part of future Mankind will probably live in floating cities and on floating islands.

Gravifugal flying craft fitted by quantum ring – ring made by pure light.

This type of gravifugal flying craft shown at fig. 11 was conceived long time ago, but I did not believed in its economical capabilities.

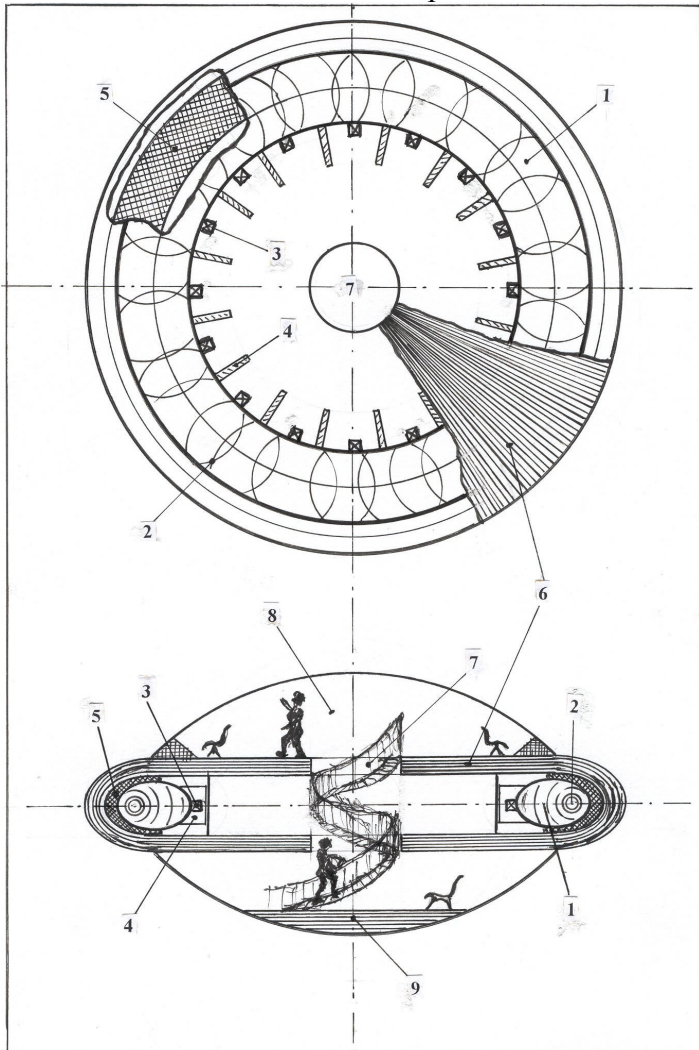


fig. 11. 1 is an evacuated steel toroidal tube with inner walls as smooth as a mirror. 2 is quantum ring – ring made by light. 3 Sources of the light. 4. Transparent photoelectrical elements. 5 Mass of electrical or electromagnetical device. 6 Construction made in nano-tubes. 7 perforation connecting different units of useful space. 8. Useful spaces. 9. Electrical batteries.

Theoretical possibility of this type of craft was shown by A.S. Eddington , 1919., when he tested claims of Einstein`s Theory of relativity. He confirmed Einstein`s Theory and, in same time showed that light possess an inercy. When the light is passing near the masive celestial bodies, **it resist** to change the direction of its movement, and change it only in a very small value.

The quanta of the light of quantum (or light) ring will behaviour in the same maner like the quanta of the ray of light and in the same manner like a particles of mass of mechanical ring. Quanta of the light of ring also will resist to the action of the gravipetal force and develop a gravifugal force. Since the velocity of light is constant, c , value of gravifugal force will depend only on the “mass” of the light ie. its **quantity**, q and value of the radius R – distance from the center of celestial body.

How it is functioning?

Sources of light, 3 are injecting the light into evacuated mirror smooth walls toroidal tube, 1. The light, 2 is reflecting from the walls of tube and endlessly rotating through tube, without possibility to disappear. When the sufficient **quantity** of light, 2 is accumulated in a toroidal tube - in accordance with equation $q c^2 / R$,

where q is in fact quantity of light - the craft starts to levitate and elevate itself.

If we want to stop elevation or levitation and let the craft down. We must put the transparent photoelectrical elements, 4 into the space of toroidal tube 1. The light will pass through those transparent photoelectrical elements and transform itself into electrical energy, which can be stored into electrical batteries.

It seems to be possible the light is moving in the both directions (clockwise and counter clockwise) in the same time. Because of it there would appear interferent statical circular wave whose velocity in the same time would be **0** and **c**.

This craft need not to have two toroidal tubes for two counter rotating quantum rings.

I believe this type of flying craft will be suitable to fast transporting of people and goods.