ABOUT SPACE EXPLORATION AND QUANTUM MECHANICS

- FAKING THE SCIENCE FOR PUPILS - PART VI

Some circumstantial facts ,,forced" me to write about a topic I was musing for long time, but which was postponed all the time for various reasons.

The topic in discussion is about latest pristine part of our planet Earth - the upper atmosphere - and how humanity can promote a sustainable space exploration.

The aerospace industry is expanding rapidly toward a permanent presence of human factor in outer space and from my point of view, it is of paramount importance for the scientific community not only to assess the negative impact of this industry for the upper atmosphere, but to support precautionary measures and to advance some new innovative solutions too.

The first section, entitled space exploration and the wild capitalism, analysis the ,,hidden" face of aerospace industry and its impact on atmosphere and especially on upper atmosphere.

The chemistry of upper atmosphere is relatively stable and it makes no sense to destabilize it in order to spend other money to fix it, in the future. I have serious doubts that aerospace industry is ever going to fix the damages they produce by burning the dirty chemicals used these days.

Not only dirty chemicals, but even water, the most ubiquitous substance on Earth surface and so essential for living organisms, is a plague for the upper atmosphere.

A wild uncontrolled and unregulated space exploration can generate in less than a decade bigger negative effects for life on Earth as more than a century of fossil fuels burning.

Do you really want such thing to happen?

The second section advances some new solutions in order to have a sustainable space exploration.

If aerospace industry wants to continue with a chemical type of propulsion, a switch to a nitrogen based fuel has to be mandatory. Such nitrogen based fuel, used in the right way, would have minimal or no impact on atmosphere and especially on upper atmosphere.

Or maybe the space tourists cannot afford a few hundreds bucks more for a cleaner fuel?

Other technologies for escaping atmosphere are discussed too.

The StarTram project was already proposed by others as a space launch system propelled by maglev technology using the slope of a mountain. A sustainable space exploration has to support

such initiative to be implemented as soon as possible and not consider it only a theoretical possibility.

In my opinion such a system should be cheaper and easier to be assembled on a platform in the upper atmosphere. First of all in order to have a platform in the upper atmosphere, it is necessary to support this platform by flotation and helium or hydrogen balloons are the only options possible.

By default hydrogen is scary because it entered in the public subconscious after the Hindenburg disaster. At 40 km altitude, in the upper atmosphere, the oxygen is so scarce that a simple burning of hydrogen would take place with difficulty, if any; to have an explosion there is out of question.

In order to carry the launching package up to the upper atmosphere platform, helium balloons can be used as far they are safer for ascending and descending through troposphere and stratosphere.

There is also necessary to develop some more reusable balloons for ascension or descent and such a prototype of a two compartment balloon is described too.

The third section discus about rocket boosters and how these can be improved.

The present chemicals used in these boosters are true ecological bombs and they have a strong impact on stratosphere and on the ozone layer.

Here there is an option of choice to switch to other cleaner chemicals or to promote a complete new technology.

The forth section changes completely the topic and presents an introductory discussion about the absurdities of classical quantum theory; „classical" because it relates to atomic structure and not to the other fields, because now after some theoreticians quantum is everywhere. For the new proposed theory QM has only a single reserved place: in the dust bin of absurd idea collection of which moderns science is full of!

Well, I think that this section is going to become the nightmare of quantum fanatics because a simple analogy with pi irrational number is going to demolish the entire foundation of this theory.

Not one, not two, not three, but four paradoxes are presented here.

The first paradox of QM: **a quanta of energy has a variable size, but a a quanta of momentum (angular, spin, possible linear) has always a constant value.**

The second quantum paradox:**the quantified motion of a particle around a center of force (in our case electron) cannot admit a continuous curve trajectory.**

There is a third paradox of quantum mechanics too:

•for an electron on orbit, the angular momentum is quantified and its energy is non-quantified.

•during a quantum jump, the energy becomes quantified and the momentum non-quantified.

The strange variation and non-conservation of angular momentum during a quantum jump represents the forth paradox of quantum mechanics.

After this introduction, there are going to be other articles about the topic soon....

In fact a newsletter about the famous quantum computer is in progress and after the advertisement for it, I suppose that no sound mind would pop up to support such imbecility. Please do not confuse quantum computer imbecility with nanotechnologies, they are completely non-related or at least they would be in the future.

It is a pity that no one in the entire world has considered necessary to support the development of this theory.

A famous dictator once said: A single death is a tragedy; a million deaths is a statistic.

My struggle (and survival) with a gang of intellectual criminals is going to be considered a tragedy; Decades of generations of youngsters, who have received a wrong and futile education, are going to be only a statistic.

The only question to be answered now is: up to what moment the society can afford such large scale experiment?

And who is going to be considered guilty?

Postponing everything toward an indefinite future, makes the entire process more costly and more traumatic!

The amplitude and the extent of the disaster is going to be „quantified" when the balance changes.

And does someone think that an overnight change is going to solve the situation?

The last section is a copy carbon from the previous newsletter (Old game, same scene, new actors and figureheads….), because it is important for people to get in touch with the expected unexpected...

SECTION I SPACE EXPLORATION AND THE WILD CAPITALISM

Please take a look at the Earth atmosphere as seen from a cosmic observer – fig. 1.

If we want that such atmosphere remains pristine for future generations, we have to avoid the wild capitalism stage in the space exploration and substitute it with a more constructive approach.

Figure 1 Space Shuttle Endeavour silhouetted against the atmosphere. The orange layer is the troposphere, the white layer is the stratosphere, and the blue layer is the mesosphere (internet picture).

The wild capitalism assumes that profits are primordial and a strong competition is necessary in order to drive down the prices.

When someone looks at the evolution of capitalism along centuries, the main pattern of its expansion was quite simple. A resource was wildly exploited until close to depletion and after that the regulatory bodies were entering into action and some „restrictions" or regulations were implemented in order to preserve the leftover.

We still consider Earth as a infinite reservoir of resources and as consequence these resources have no value at all and the price of a product reflects usually the human effort or other collateral costs.

One has to make a simple estimation how much it cost the humanity to create a small volume of artificial atmosphere suitable for surviving, and International Space Station is a good example. That small volume is not suitable for developing an ecosystem and maintain it for long term...

I do not have some estimate, but by sure the price for having 1 m3 of artificial atmosphere on International Space Station means costs of about 1 billion $. And each year only to maintain that atmosphere, there are a few hundreds millions $ of expenses only to ship some materials from Earth up to 400 km distance …

If Earth atmosphere, for which creation nu capitalist has ever invested a single $, is so precious, why do you want to destroy it for nothing?

By allowing an entire aerospace industry to flourish without taking into consideration the risks, it means that humanity does not appreciate the gift we have …..

If the wild capitalism pattern is timplemented for the space exploration too, then the present global warming menace would be the least problem for humanity.

A wild uncontrolled and unregulated space exploration can generate in less than a decade bigger negative effects for life on Earth as more than a century of fossile fuels burning.

As a preambul, I have to underline that I am in favour of space exploration and I do not consider that private engagement is „in principle" worse than state space agencies.

I do not think that a private company can outperform NASA (probably other agencies either!) in its malpractices ever...

Few people know that NASA put into suborbital orbit some ion thrusters based on, based on...you would not believe it! ..based on **mercury**!

The information released on internet presents two series of tests with this mercury thrusters. For the first series of tests made in 1960 and 1964, I could not find some specific details related to the time they tested the so called Space Electric Rocket Test-1 (SERT-1). For the second series of tests made in 1970, NASA successfully operated two thrusters for about 2011 hrs and respectively 3781 hrs in space.

Humanity has to be fortunate for the fact that mercury is a quite scarce and implicitly expensive material, otherwise probably we would have occasionally mercury rains on Earth. The NASA scientists never heard about the toxicity of mercury ….....

I still cannot believe that such device was allowed to leave the laboratory and was used in low orbital flights! The amount of mercury released in troposphere by coal burning has not been enough so some were considering to have a bit in the upper atmosphere too. Or maybe they wanted to offer us some special optical effects because having auroras in only two colors is so boring...

It is a pity that for close to a century, thausands of scientists worked for famous space agencies and between them there was no single clear chemical mind to asses the results of such activity for the upper atmosphere.

The situation in this field can be grasped even by a laymen by reading a recent article (2017) in Scientific American and here I am going to quote an excerpt:

How Much Air Pollution Is Produced by Rockets?

https://www.scientificamerican.com/article/how-much-air-pollution-is-produced-by-rockets/

Nobody knows the extent to which rocket launches and re-entering space debris affect Earth's atmosphere — but such ignorance could be remedied soon.

The issue of rocket emissions—which deliver gases and particles directly into the middle and upper atmosphere—will be included in a forthcoming United Nations 2018 Quadrennial Global Ozone Assessment that delves into the substances responsible for ozone depletion.

"The climate impact of rockets has not really been seriously addressed as yet," Ross, a senior project engineer for civil and commercial launch projects at The Aerospace Corporation in El Segundo, California, told Space.com. "But with respect to ozone, we now understand that the climate and ozone impacts of rocket exhaust are completely intertwined."

Rocket soot accumulates in the upper stratosphere, where the particles absorb sunlight, Ross said. This accumulation heats the upper stratosphere, changing chemical reaction rates and likely leading to ozone loss, he added.

In flagging the issue, Ross said he hopes the scientific community becomes interested enough to start running atmospheric models of the phenomenon—especially because the pace of rocket launches is expected to ramp up significantly in the coming decades.<...>

Well, in the wild capitalism, when something represents an inconvenient, it is a used practice to question and undermine the solidity and even the validity of that inconvenient. The fact that rockets have a significant negative impact on atmosphere is an already known fact. But, as a supporter of wild capitalism, the Scientific American cannot publish an article showing how dangerous this activity for humanity is! so, it publishes an article questioning the impact of this activity and of course is asking for time and for more studies, i.e money!

If the published article were to be formulated as a certitude, a restriction regarding the expansion of space industry would have been a necessity …..

There are a handful of other articles published in the last decade which demonstrate without doubt the negative effects of gas emission and injection of contaminant species in the upper atmosphere.

Here is such an online article which makes an overview for the situation:

IMPACT OF ROCKET EXHAUST PLUMES ON ATMOSPHERIC COMPOSITION AND CLIMATE AN OVERVIEW

https://www.eucass-proceedings.eu/articles/eucass/pdf/2013/01/eucass4p657.pdf

Rockets are the only direct anthropogenic emission sources into the upper atmosphere. Gaseous rocket emissions include CO, N2, H2, H2O, and CO2, while solid rocket motors (SRM) additionally inject significant amounts of aluminum oxide (Al2O3) particles and gaseous chlorine species into the atmosphere. These emissions strongly perturb local atmospheric trace gas and aerosol distributions. Here, previous aircraft measurements in various rocket exhaust plumes including several large space shuttle launch vehicles are compiled. The observed changes of the lower stratospheric composition in the near ¦eld are summarized. The injection of chlorine species and particles into the stratosphere can lead to ozone loss in rocket exhaust plumes. Local observations are compared with global model simulations of the effects of rocket emissions on stratospheric ozone concentrations. Large uncertainties remain concerning individual ozone loss reaction rates and the impact of small-scale plume effects on global chemistry. Further, remote sensing data from satellite indicate that rocket exhaust plumes regionally increase iron and water vapor concentrations in the mesosphere potentially leading to the formation of mesospheric clouds at 80- to 90-kilometer altitude. These satellite observations are summarized and the rocket emission inventory is compared with other natural and anthropogenic sources to the stratosphere such as volcanism, meteoritic material, and aviation.

I support the opening of an entire new field of research related to the upper atmosphere, but in the same time I think it is necessary to take precautionary measures based on the available data.

It makes no sense to allow the expansion of a new industry and in parallel to accumulate more data showing how this industry is menacing the life on Earth!

Wouldn't be easier to channel the expansion of this aerospace industry in a way which is sustainable for the humanity?

Bellow are other scientific considerations and a larger vision of the impact of this new unregulated expanding aerospace industry can have on upper atmosphere.

Water, the most ubiquitous and necessary substance for life on Earth, is going to be a plague for the upper atmosphere when the concentration there reaches some specific thresholds for each atmospheric layer.

Carbon dioxide is already framed as an unfriendly substance for Earth atmosphere. Unfortunately there is a confusion of the terms used because in the common language atmosphere is synonymous with troposphere, i.e. the layer of atmosphere up to about 12 km height.

It is obvious that carbon dioxide produced by humans on Earth surface cannot arrive by itself in the upper atmosphere....

There is no detailed assessment regarding the effects on carbon dioxide releases directly in the upper atmosphere and what are the long therm consequences.

The development of commercial human space flight by entrepreneurs and privately funded companies has already become a new segment of the aerospace industry. The space tourism is expected to become a multimillion dollar industry by providing to those interested the experience of an ,,out of atmosphere" travel.

At present, space travel and tourism is reserved to an elite who can afford such prices. As the field expands, it is expected to become economically affordable for a larger category of people.

For example NASA has estimated to about $81 million per seat the cost of sending astronauts to the International Space Station aboard a Russian Soyuz rocket.

I do not know the last offer for a seat offered by SpaceX. The latest information I found estimate the cost for a trip to International Space Station was around $52 million per person.

The following discussion focuses on scientific consequences for Earth atmosphere of this new expanding space tourism industry. I am going to skip the impact of aluminum oxide, carbon black and other contaminants which were already discussed by other scientists in the up presented online articles.

All practical solutions developed up to this moment by space industry regards the burning of some chemicals on order to obtain thrust necessary for the space rocket take off and navigation.

Space X, as example, is using liquefied methane and the combustion reaction is well known even for laymen.

$$CH_4 + 2\,O_2 \rightarrow CO_2 + 2H_2O$$

Other types of rockets use kerosene or refined petroleum distillate and the burning products for these mixtures are similar to methane. Last but not least, liquid hydrogen is also a common rocket fuel.

Now, when such rockets are taking off, the burning of the fuel releases carbon dioxide and water continuously as the altitude of the rocket increases (the rockets on hydrogen release only water).

The release of carbon dioxide and water in the troposphere – fig. 2, has the same effects as an huge car engine. As far there is already a lot of CO2 in troposphere coming from more than a billion thermal engines and a lot of water coming mostly from evapotranspiration, the rocket can be regarded as a ,,usual" polluter and anyone knows the consequences.

When the rocket arrives in stratosphere -fig. 2, the situation changes a bit but not dramatically. The stratosphere, and especially upper stratosphere, should have no carbon dioxide at all and only small amounts of water coming from other natural sources.

These new added amounts of water and carbon dioxide could have only a physical effect or both a physical and chemical effect once they are injected into stratosphere.

In the happiest case that water and carbon dioxide in stratosphere have an ,,inert" chemical comportment, their presence there cannot be neglected.

In the stratosphere, carbon dioxide would have the same effect as in troposphere. Water has a more ambivalent comportment. As clouds it can reflect back a lot of Sun light, but as individual molecules dispersed in a mixture of gases it has a consistent absorption in infrared and it can have a greenhouse effect too.

It is difficult to predict the entire outcome of an input of water and carbon dioxide in stratosphere in absence of some more reliable data. These data can be obtained by tests in laboratory and not by contaminating the entire stratosphere.

More dangerous is the fact that from a certain threshold for the water and carbon dioxide concentrations in the stratosphere, a convection cell between stratosphere and troposphere can emerge and, at that moment, life on Earth is screwed.

The release of carbon dioxide and water in the mesosphere and thermosphere - fig. 2, is going to have more dramatic consequences. Again, I am going to consider that these substances are chemically inactive and only a physical effect take place.

Mesosphere and thermosphere have a very dilute concentration of matter and the release of carbon dioxide and water from a fleet of space rockets is going to completely change the chemical composition of these atmospheric layers. Water and carbon dioxide cannot be considered contaminants here, but they are going to become the main constituents of the mesosphere and thermosphere.

Does someone think that 400 ppm in the troposphere would be a problem when upper atmosphere is going to change composition to mainly carbon dioxide and water ?

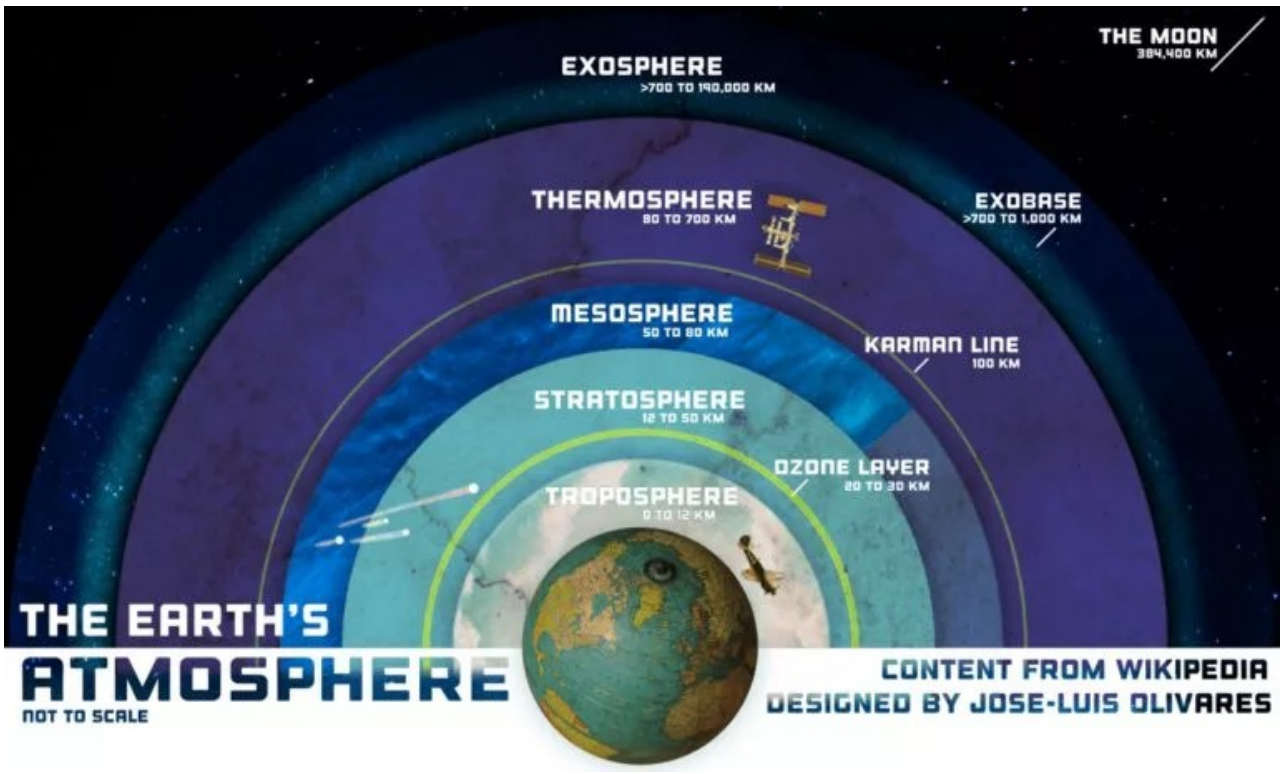

Figure 2.

Well, a more complete analysis of the situation has to take into consideration not only physical effects but chemical effects too.

Some general properties of Earth atmosphere are presented in tab. 1 and fig. 3.

Geo potential Altitude above Sea Level *- h - (m)*	**Temperature** *- t - (^oC)*	**Acceleration of Gravity** *- g - (m/s^2)*	**Absolute Pressure** *- p - (10^4 N/m^2)*	**Density** *- ρ - (kg/m^3)*	**Dynamic Viscosity** *- μ - (10^{-5} $N\,s/m^2$)*
-1000	21.50	9.810	11.39	1.347	1.821
0	15.00	9.807	10.13	1.225	1.789
1000	8.50	9.804	8.988	1.112	1.758
2000	2.00	9.801	7.950	1.007	1.726
3000	-4.49	9.797	7.012	0.9093	1.694
4000	-10.98	9.794	6.166	0.8194	1.661
5000	-17.47	9.791	5.405	0.7364	1.628
6000	-23.96	9.788	4.722	0.6601	1.595
7000	-30.45	9.785	4.111	0.5900	1.561
8000	-36.94	9.782	3.565	0.5258	1.527
9000	-43.42	9.779	3.080	0.4671	1.493
10000	-49.90	9.776	2.650	0.4135	1.458
15000	-56.50	9.761	1.211	0.1948	1.422

Geo potential Altitude above Sea Level - *h* - *(m)*	Temperature - *t* - *(^oC)*	Acceleration of Gravity - *g* - *(m/s^2)*	Absolute Pressure - *p* - *(10^4 N/m^2)*	Density - *ρ* - *(kg/m^3)*	Dynamic Viscosity - *μ* - *(10^{-5} $N\,s/m^2$)*
20000	-56.50	9.745	0.5529	0.08891	1.422
25000	-51.60	9.730	0.2549	0.04008	1.448
30000	-46.64	9.715	0.1197	0.01841	1.475
40000	-22.80	9.684	0.0287	0.003996	1.601
50000	-2.5	9.654	0.007978	0.001027	1.704
60000	-26.13	9.624	0.002196	0.0003097	1.584
70000	-53.57	9.594	0.00052	0.00008283	1.438
80000	-74.51	9.564	0.00011	0.00001846	1.321

Tabel 1 Standard Atmosphere Air Properties -

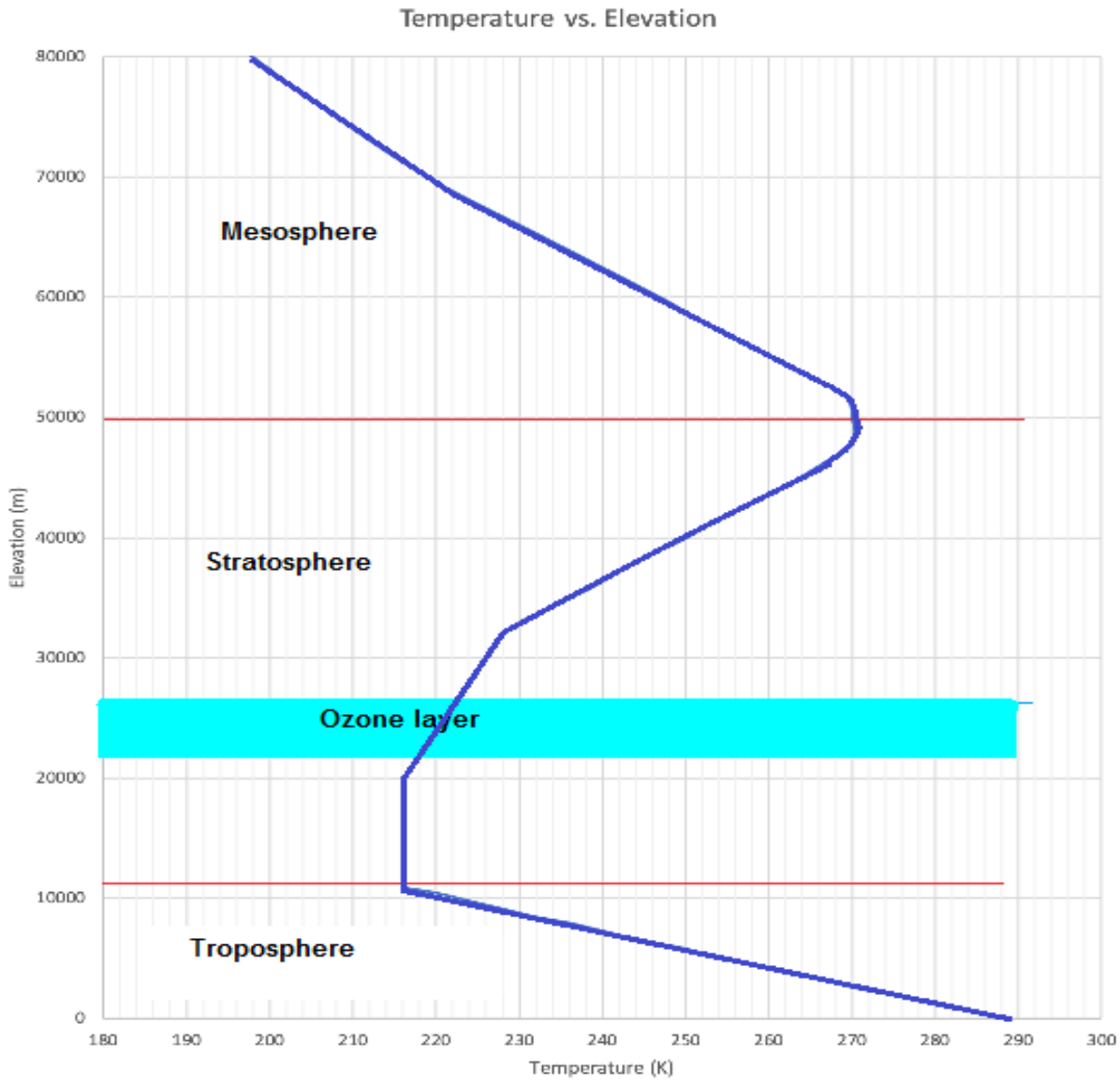

Figure 3

Let us see the consequences of a Saturn V rocket during its passage through atmosphere in July 1969 with the occasion of first supposed trip to Moon.

Here are some data about the fuel used and amounts:

<...> The first stage of Apollo 8 Saturn V being erected in the VAB on February 1, 1968. Engine fairings and fins not yet installed.

The S-IC was built by the Boeing Company at the Michoud Assembly Facility, New Orleans, where the Space Shuttle external tanks would later be built by Lockheed Martin. Most of its mass at launch was propellant: RP-1 fuel with liquid oxygen as the oxidizer. It was 138 feet (42 m) tall and 33 feet (10 m) in diameter, and provided over 7,600,000 pounds-force (34,000 kN) of thrust. The S-IC stage had a dry weight of about 289,000 pounds (131,000 kilograms); when fully fueled at launch, it had a total weight of 5,100,000 pounds (2,300,000 kilograms). It was powered by five Rocketdyne F-1 engines arrayed in a quincunx. The center engine was held in a fixed position, while the four outer engines could be hydraulically turned with gimbals to steer the rocket.[44] In flight, the center engine was turned off about 26 seconds earlier than the outboard engines to limit acceleration. During launch, the S-IC fired its engines for 168 seconds (ignition occurred about 8.9 seconds before liftoff) and at engine cutoff, the vehicle was at an altitude of about 42 miles (67 km), was downrange about 58 miles (93 km), and was moving about 7,500 feet per second (2,300 m/s).<...>

<...> For the Apollo mission to the moon, Saturn V rocket's first stage carried 203,400 gallons of kerosene fuel and 318,000 gallons of liquid oxygen needed for, totaling over 500,000 gallons of fuel for getting out of the atmosphere alone.<...>

The burning reaction for kerosene is :

$2\ C_{12}H_{26}(l) + 37\ O_2(g) \rightarrow 24\ CO_2(g) + 26\ H_2O(g);\ \Delta H^\circ = -7513 kJ$

616 t of kerosen 842 t of oygen → approx.1010 t carbon dioxide and 445 t water

The amount of product reaction is estimated and not calculated, based on the idea that mass reagents = mass products (usually any engine works with an excess oxygen).

For each km of atmosphere, moving upwards, the rocket has released practically about 15 t of carbon dioxide and about 6,5 tons of water. For simplification, I made the assumption of an uniform rocket acceleration, although in practice the situation is a bit different.

The amount of about 200 t of carbon dioxide and about 100 tons of water released in troposphere is not a big fuss because there are other human or natural effects which release more water and carbon dioxide here.

The release of about 233 t of water and 525 tons of carbon dioxide released in stratosphere should be already a topic of discussion for scientists.

The density of stratosphere decreases from about 0,1948 g/cm3 at 15 km altitude to about 0,001027 g/cm3 at 50 km altitude. There is also a curios variation for temperature in stratosphere: after a temperature inversion between troposphere and stratosphere, the temperature goes toward a maximum value at the upper stratosphere.

At 50 km altitude, the density of stratosphere is tiny, about 0,001027 g/cm3 and this means means an amount of 1 kg matter per m3.

When 6,5 t of water and 15 tons of carbon dioxide are released at this altitude for 1 km of rocket trajectory, the effects are commensurate. The stratosphere has a small amount of water generated by natural processes like meteoric activity, but this does not mean it is possible to inject whatever amounts of water without bringing perturbations to to the system.

Furthermore at around 25 km, in stratosphere, the essential ozone layer has a maximum concentration and there is no study about the effect of a the release of water and carbon dioxide for this substance.

One has to imagine that in the pristine stratosphere of Earth, the UV radiation is able to break oxygen molecule and transform it into ozone.

Well, by injecting water and carbon dioxide in this layer, beside the change in chemical composition of this layer, new reactions are possible and the consequences are dramatic.

Here are some values for oxygen and hydrogen bound energies in case of these substances:

O_2	498 kJ/mol
O_3	364 kJ/mol
HO-OH	142 kJ/mol
HO-H	459 kJ/mol

The O-H bound in water is weaker as the double bound in oxygen so most of the water molecules in stratosphere are going to be preferentially broken in components and an entire new chain of chemical reactions is possible.

The new formed HO radical is going to be by far the most reactive specie there and it is important to see how the concentration of ozone is affected by this new invasive specie – fig. 4.

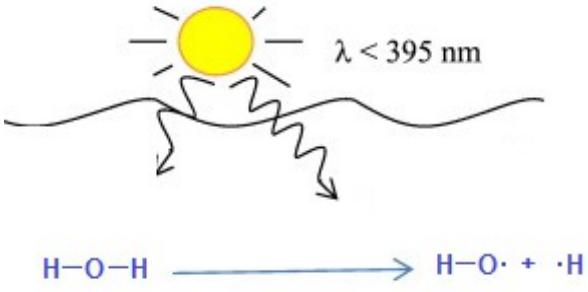

Figure 4

The chemical changes are going to be even more dramatic for the mesosphere and thermosphere.

Here, the density of matter is quite negligible when expressed in g/cm3,

For example at 80 km altitude the density is 0,00001846 g/cm3 and this means 1 m3 contains about 0,018 kg.

Can a common sense mind imagine that a rocket fleet is going to release millions of tons of water and carbon dioxide in its regular trip without affecting this atmospheric layer?

If the released carbon dioxide and water remained trapped here and accumulates in time, then it is going to be quite irrelevant if the corresponding concentration of CO2 at the Earth surface is going to arrive at 500 ppm.

The upper atmosphere is going to become the main driver of a climate change and a real nightmare for the life on Earth.

The formation of water clouds at these altitude can change the entire climate pattern on Earth. Imagine that at 80 km altitude there is a stationary cloud which blocks the Sun to arrive at Earth surface for a couple of months.

Well, some are going to consider that such effect can cool the Earth, but this is only an illusion. The entire weather pattern will change with unknown consequences....

The entire agriculture can collapse for an entire hemisphere, not only for one country! An entire chain of catastrophic effects are going to succeed ….

I opened this discussion because it is important that some regulations are implemented in this field in order to avoid that leisure of some become the nightmare of entire humanity.

In fact the entire field of atmospheric science has to be started from scratch.

The dichotomy of corpuscle-wave character in quantum theory has a less known but equally absurd corespondent in atmospheric science.

For any common sense mind the atmosphere is a gas envelope and it should obey to gases laws.

Yet, when the variation of atmosphere density with altitude is estimated, the model used is a combination between fluid mechanics and gas theory. Gas theory alone is not able to explain such variation. In fact according to gas theory, there should be one unique atmospheric layer in the atmosphere.

So, in the atmospheric science there is a gas-fluid duality similar to the wave-corpuscle duality in quantum theory and no one was interested to solve it...

As example, for the calculation of density with altitude, the following equations are used.

- The equation of state from gases theory: $p = \rho R T$
- The hydrostatic equation from liquid mechanics: $dp/dh = - \rho g$

The hydrostatic equation can be easily derived by considering the balance of forces on a small fluid element. Consider a cylindrical fluid element of area A and height Δh as in fig. 5.

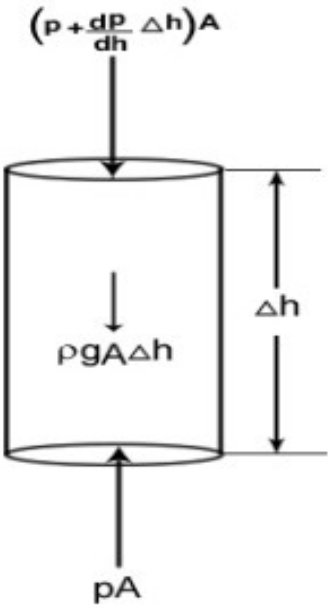

Figure 5

The forces acting in the vertical direction on the element are the pressure forces and the weight of the element. For vertical equilibrium of the element,

$pA - \{p + (dp/dh)\,\Delta h\}\,A - \rho\, g\, A\, \Delta h = 0$

Simplifying, $dp/dh = - \rho g$

For any theoretical model it is very difficult to explain in a consistent manner a simple temperature inversion between troposphere and stratosphere, as an example why a new approach is necessary …

SECTION II TOWARD A SUSTAINABLE SPACE EXPLORATION

Rocket chemical propulsion

At a certain moment in the past, I submitted a request for a job at Space X and Tesla companies but they were not interested in my candidature; for them it was obvious that a third world citizen could not bring an important contribution for their activity.

I admire the fact that they brought a new innovative approach in what they are doing, but in the same time it is a pity that they took some wrong directions regarding the fuels used.

In a previous newsletter, it was already postulated that a future chemical fuel for humanity has to be based on nitrogen and not on carbon.

In order to have a sustainable future, the entire rocket fleet designed for closed to Earth space explorations has to be converted to a nitrogen based fuel.

For a trip to Mars and back there is no problem in using a carbon based fuel as far this option make sense from various reasons and this is one in a decade mission. Even in this case it would be better that such trip starts from an outpost of space exploration like International Space Station.

In contrast to these long trips, for all the other short trips between Earth surface and International Space Station, the use of a carbon based fuel has to be prohibited as far this is an ecological catastrophe for the upper atmosphere. It is necessary that someone rings the bell to the decision factors in order to regulate this activity for all the players.

Non only that a nitrogen based fuel gas to become compulsory for the take off and near Earth travels, but this fuel has to be burned or decomposed differently during rocket launch in order to keep the upper atmosphere uncontaminated with other chemical species.

The simplest nitrogen based fuel which can be used for space propulsion is hydrazine.

During usual burning this substance produces nitrogen and water.

$$N_2H_4 + O_2 \rightarrow N_2 + 2\,H_2O$$

The first stage of a space rocket during its ascension in troposphere should use the normal burning of hydrazine. The released substances during this burning have no negative impact for this atmospheric layer. Water is going to fall back on Earth as rain or snow and nitrogen is the main component of the atmosphere.

Well, the first stage has to be redesigned in order to be executed up to maximum 15 km altitude.

Once the rocket enters into stratosphere, the second stage of ascension have to use the same fuel but, it has to decompose it after the reaction:

$$N_2H_4 \rightarrow N_2 + 2H_2$$

The decomposition of hydrazine avoids the release of water in the upper atmosphere and avoids all the up presented negative consequences. The hydrogen molecule should normally escape Earth gravitation and diffuse in cosmic space. The nitrogen released by the rocket does not have a negative impact on upper atmosphere as far this is the main component of it.

By using such fuel, and having a large fleet of rockets, there is going to be a second advantage for the Earth inhabitants. The loss of hydrogen in space is going to consume water on Earth, and this means that in one century of space exploration the level of oceans will decrease probably with few mm. I wrote about water export from Earth with another occasion as a countermeasure for ice melting.

The entire trip between stratosphere up to the International Space Station, which is the most advanced outpost for space exploration today, have to use the decomposition of hydrazine for the travel. Fig. 6 presents such an environmental friendly space rocket trip for those who want to have a sustainable space tourism industry.

The use of hydrazine decomposition is already known and there are some emergency power kit units for military airplanes which use this substance as a power source. Well, they use it differently to generate electricity, but this is another story ….

A lot of people are scared of hydrogen, but in the upper space conditions its use is much safer as far there is not enough oxygen for burning or explosion.

Other substances have to be tested for upper atmosphere use, although there are not so many options which can offer a good thrust and not contaminate the upper atmosphere with foreign species.

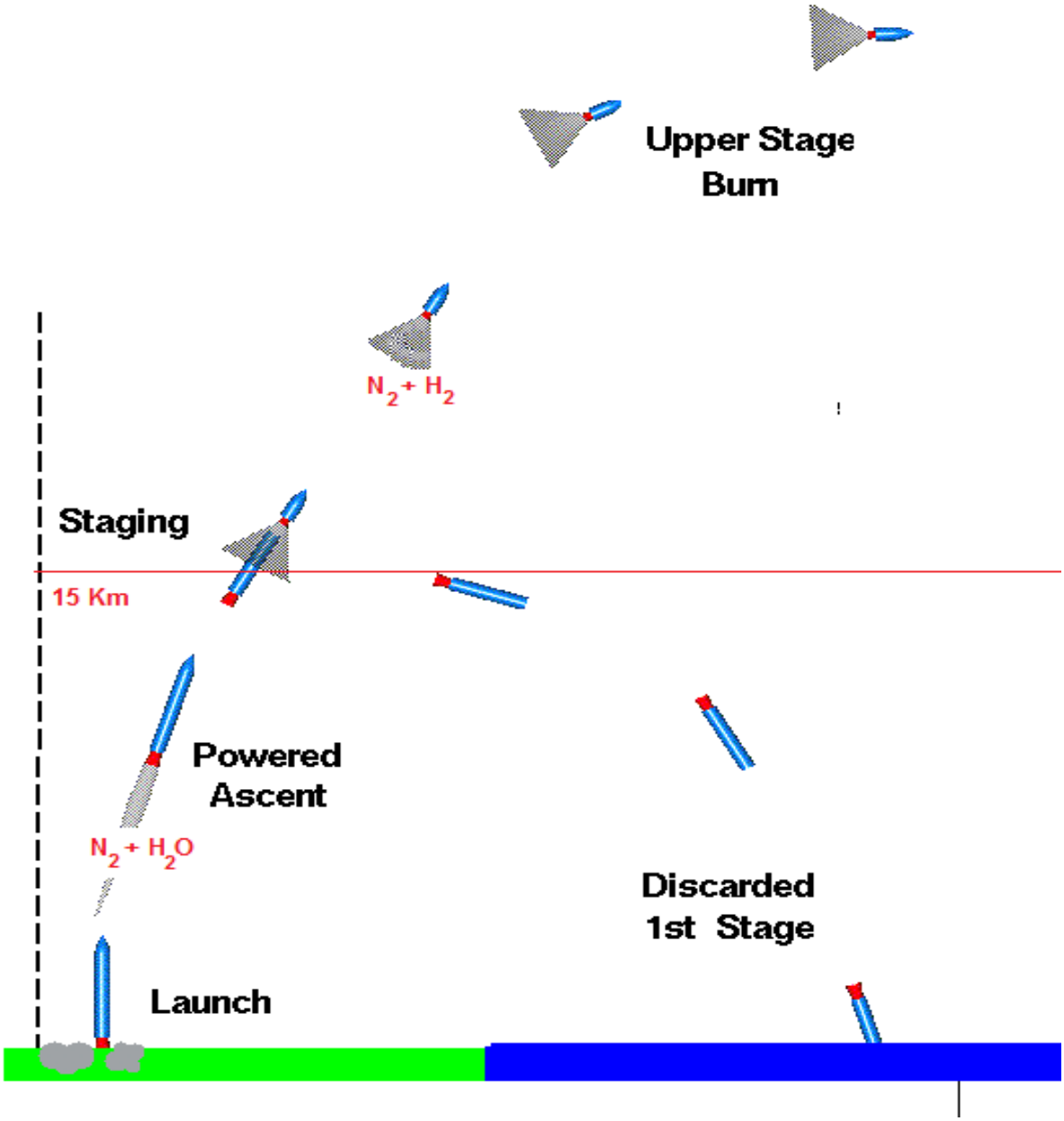

Figure 6 Rocket launch (NASA modified picture)

Other forms of space launch

In the 1960s Eric Roberts Laithwaite developed the linear induction motor and introduced the first practical application of electromagnetic propulsion. In 1966 James R. Powell and Gordon Danby patented the superconducting Maglev transportation system, and shortly after the engineers around the world raced to create the high-speed train.

The concept of StarTram was already proposed as a space launch system propelled by maglev type system:

https://en.wikipedia.org/wiki/StarTram

A sustainable space exploration has to support such initiative to be implemented as soon as possible and not consider it only a theoretical possibility.

I did not have the time to analyze the feasibility of a StarTram system built on a slope of mountain.

In my opinion such a system should be cheaper and easier to be assembled on a platform in the upper atmosphere.

First of all in order to have a platform in the upper atmosphere it is necessary to support this platform by flotation and helium or hydrogen balloons are the only options possible.

By default hydrogen is scary because it entered in the public subconscious after the Hindenburg disaster. At 40 km in the upper atmosphere, the oxygen is so scarce that a simple burning of hydrogen would take place with difficulty, if any!; to have an explosion there, is out of question.

It would be sound to assemble a platform in the upper atmosphere supported by hydrogen balloons and use such platform as a launching system type maglev - fig. 7.

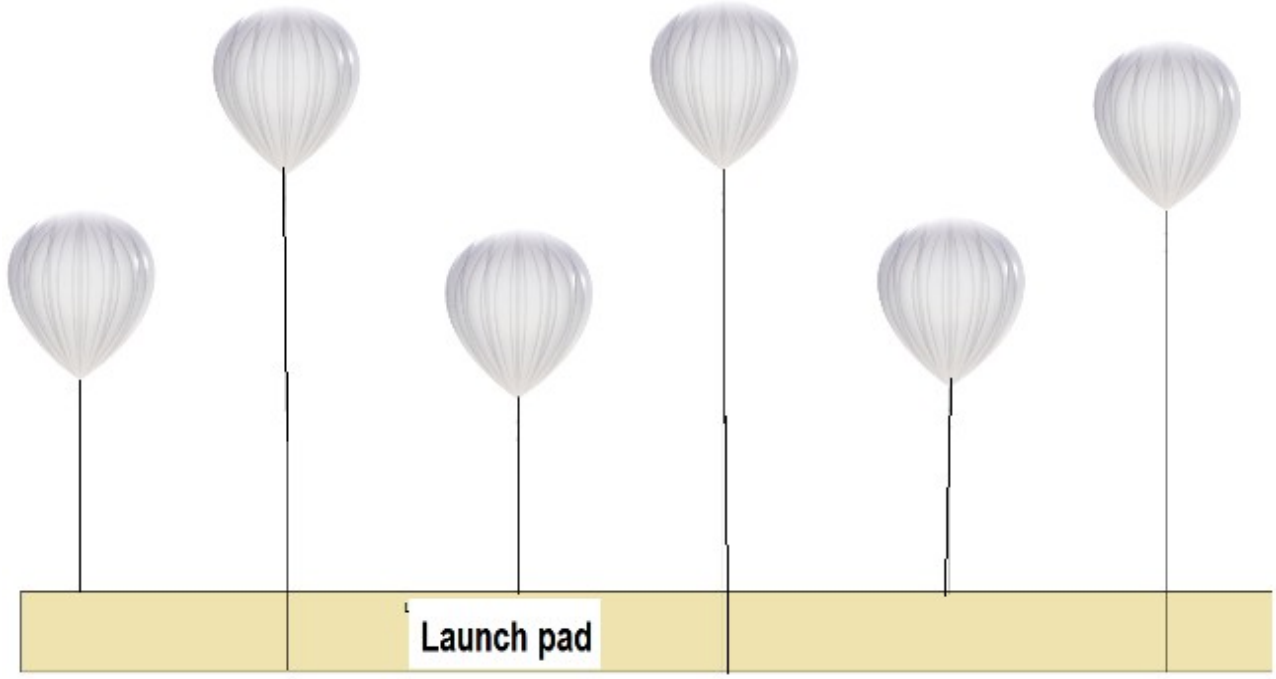

Figure 7 Upper atmosphere platform supported by buoyancy

I think that such platform can be used to launch even small rockets powered by hydrazine up to the International Space Station.

In order to carry the launching package up to the upper atmosphere platform, helium balloons can be used as far they are safer for ascending and descending through troposphere and stratosphere.

About 80% or even more of a present rocket load is practically the fuel necessary to escape Earth gravitation and atmosphere. By using such platform the cost to arrive to International Space Station is much lower and the procedure is sustainable for our atmosphere.

With such a platform in the upper atmosphere usable, it is possible to have a complete different management for the short and long trip space exploration missions.

I think that NASA still has some problems with grandeur, because they want to build the most powerful rocket ever....

https://www.livescience.com/nasa-space-launch-system-giant-rocket-test.html#:~:text=At%20322%20feet%20tall%20(98,thrust%20during%20liftoff%20and%20ascent.

NASA will soon fire up the most powerful rocket ever built

At 322 feet tall (98 meters), the SLS stands a head shorter than the 363-foot (110 m) Saturn V rockets that carried astronauts to the moon in the 1960s and '70s. But this rocket is substantially more powerful, producing 15% more thrust during liftoff and ascent.

….

When complete, if everything goes right, the SLS will have the capacity to carry more than 27 tons (24,000 kilograms) to the moon — much more than the 24 tons (22,000 kg) the Space Shuttle hauled into low-Earth orbit, though technically less than the Saturn V carried to the moon.

Well, by sure such a rocket would have a big contribution to the changes produced in the upper atmosphere composition and the effects are going to be supported by future generations....

It is common sense that such upper atmosphere platform cannot be used to directly accelerate a big space rocket going to the Moon or something similar. But with an intelligent approach, such platform can be used as an intermediate carrier of payload to another assembly point let us say the International Space Station.

The payload from Earth can be divided and lifted by balloons up to such an upper atmosphere platform and from there it can be launched toward the International Space Station.

The International Space Station could act as a collector and assemble line for the long trip missions and with such approach the expenses are much smaller, the upper atmosphere remains uncontaminated and humanity can still prosper on Earth.

Such an upper atmosphere platform can be used as hotel too for those who want to see the Earth from upstairs .....

Well, don't imagine that the same platform can be used for both activities, one has to build separate platforms with separate designs for these purposes.

This is the most sustainable approach for a sub-orbital tourism industry as far there is no collateral negative effect for the atmosphere. The ascending and descending trips are made by buoyancy using physical means so there is no chemical fuel used. One tourist can enjoy the entire ascending and descending trip in a balloon instead of getting scrambled into a rocket seat.

There is also necessary to develop some more reusable balloons for ascension or descent. I think that a balloon with two compartment and the possibility to change the volume ratio between these compartments is necessary.

Let us suppose the ascension trip is planned to take place using such a two comportment balloon where a compartment has helium and the second compartment has nitrogen.

In order for the balloon to ascend, a small compressor compress the nitrogen from one compartment into a bottle and simultaneously helium is released to fill in the first compartment. At maximum ascension, the entire amount of nitrogen is compressed and only helium ensures the ascension buoyancy.

Once the balloon is docked and the payload transferred, during the descent trip it is necessary to compress the helium into a bottle and release the nitrogen in order to sink the balloon in the atmosphere.

It is possible that such an upper atmosphere platform can be used even for a future space elevator.

From a lot of reasons, I do not think that a future space elevator is safe being anchored on the Earth surface, but being anchored on such an upper atmosphere platform it makes a lot of sense.

Well, the space elevator has to wait many generations as far the main directions of research in present science are neutrinos and other absurd cosmic illusions like black holes, neutron stars, quantum computing, etc.

Maybe some people would stop the imbecile research programs in neutrino field, black holes, etc. and in this case some money can be allocated for such more ,,down to Earth" practical applications.

SECTION III

IS IT POSSIBLE TO HAVE OTHER TYPES OF ROCKET BOOSTERS?

The rocket boosters operate in parallel with the main engine for the first few minutes of flight in order to provide an additional thrust needed for the rocket to escape the gravitational pull of the Earth.

In the current procedure, at an altitude of approximately 45 km, the boosters separate from the rocket. After separation, the boosters are descending by parachutes and landing in the ocean. Lately, Space X introduced a controlled descent of the boosters which are landing on a platform.

Based on the type of fuel used there are solid and liquid fueled busters.

The first type of solid busters were using gun powder as propellant.

It is easy to understand how these boosters were true ecological bombs if one understands a little bit of chemistry. Gun powder consists of potassium nitrate (75% by weight), charcoal or other carbon material (10% by weight), and sulfur (5% by weight).

By using two boosters which were weighing in some cases up to 500 tons each, some launching rockets were releasing approximately 100 tons of sulfur dioxide in the atmosphere beside other problematic chemical species.

Lately, the solid busters are using aluminum and ammonium perchlorate (NH4ClO4). The chlorine and aluminum oxide species are problematic for the atmosphere and this fact is already known, but no one is interested to take measures and restrict the use of such chemicals.

Some scientists think that such releases are in fact a „benefit" for humanity. In a previous newsletter, I discussed about the absurd idea of geoengineering the Earth climate by injecting sulfur dioxide in the upper atmosphere.

It is really true that about once in a century, a massive volcanic eruption releases millions of tons of volcanic ash, dust and sulfur dioxide and for the latest one, there are extensive studies about the changes induced to the Earth climate.

https://en.wikipedia.org/wiki/1991_eruption_of_Mount_Pinatubo

These are natural phenomena and I do not think that Philippine or any other affected country were happy with this event. I do not think that a „common sense" mind wants that such event affects him directly in a voluntary way …

The supporters of the sulfur dioxide injection in upper atmosphere are physicists for whom chemistry is a completely alien science and few of them know how to write a chemical equation at least!

If it is explained correctly, even a laymen can understand the complexity of a volcanic eruption, and after that no one is going to support an artificial injection of sulfur dioxide in atmosphere.

If one mixes some sulfuric acid with some volcanic ash (which is a mixture of silicates), the sulfuric acid being stronger as silicic acid, is going to bind to the volcanic ash. It is possible that silicic acid is produced in case of a complete reaction or some more complex combinations are formed in case of partial reactions.

Practically the volcanic ash acts as a buffer system for the sulfuric acid and the effects are much milder.

For the non chemists, silicic acid is a soluble form of hydrated sand and it is a harmless gel which can be manipulated with bare hands. In fact I was playing with such gel sometime in the past making molds, etc. By comparison, I do not think that someone wants to see the effects of sulfuric acid for a living tissue ….

Do not imagine that in atmosphere there is the possibility to accumulate so much silicic acid in order to form a gel though!

In case of a volcanic eruption, the sulfur dioxide released in atmosphere combine first with oxygen and water and forms by some intermediate reactions sulfuric acid or sulfurous acid. Both these acids bind to volcanic ash in the atmosphere and in time these aerosols are going to be incorporated in the rain droplets and eliminated from atmosphere. By performing these succession of chemical reactions in atmosphere, the effects of sulfuric or sulfurous acid are much tempered and usually there are not exacerbated effects on living tissues.

If the volcanic eruption arrives to perturb the ozone layer (not all eruptions arrive the that altitude), then another series of collateral effects are observed for the living organisms. It is obvious that sulfur dioxide is going to preferentially combine with ozone and a depletion of ozone layer is an immediate consequence. Yet, the entire cloud of volcanic ash behind acts as a sunscreen too and capture most of the damaging UV radiation.

One has to keep in mind these very complex and generally negative effects of major volcanic eruption for humanity, when some „imaginary benefits" are considered. One of such praised benefit regards the decrease of temperature at the Earth surface due to the screening effect of dust and chemicals released in the atmosphere.

Well, this is a temporary effect because in a couple of months or years the cloud of ash and aerosols is dispersed or is incorporated into the precipitation cycle.

Some physicists, without understanding an iota of chemistry, wants to inject only sulfur dioxide or other precursor for sulfur dioxide into atmosphere with the hope that only a reduction of temperature is obtained and the other negative effects are completely disconsidered.

In reality, by injecting only a sulfur dioxide, not only the negative effects are much exacerbated, but I am not sure if a reduction of temperature is going to be obtained.

By injecting only sulfur dioxide in atmosphere the acid rain is going to become a reality and „dancing in the rain" is going to become an impossible thing for future generations. Or maybe who knows: capitalism is full of surprises and opportunities. Someone would invest into a company to produce artificial skin and periodically each person is going to replace the damaged skin with a new one.

If this skin replacement is going to be implemented, then the destruction of ozone layer by sulfur dioxide will be tolerated too! At least by humans! The rest of Earth ecosystem is going to be genetically modified in order to tolerate the new climate adjustments too!

From the information I read up to this moment, I have serious doubts that sulfur dioxide alone is going to produce a decrease in temperature as foreseen by some physicists. In my opinion it is necessary to revise the information published so far and eventually have a more thorough analysis...

No such supporter of this technology have ever imagined another catastrophe. Let us suppose that such technology is implemented and after filling in the stratosphere with sulfur dioxide a major volcanic eruption takes place. The fact that a major eruption takes place once in a century is only a statistic or in other words, it is a probabilistic thing. There is no certitude that such event cannot take place in a year in a decade or even in half century. Such natural event corroborated with our mad technology can bring an entire or even more nations to the limit of self destruction. Such cumulative effects from a mad technology and from an exceptional natural event can generate other secondary weather patterns which are difficult to be imagined at least ….

Having in mind these considerations for sulfur dioxide, it is a complete nonsense to assume that it is possible to have a geoengineering the Earth climate with black carbon and alumina coming from rocket boosters use. The use of these substances has to be completely prohibited for aerospace industry ....

The solid boosters are still largely used, because they are cheaper and able to deliver a large amounts of thrust with a relatively simple design.

The liquid boosters are the another important segment and they usually use some hypergolic pairs of substances; One of the preferred combination is based on 1,1-dimethylhydrazine or UDMH and nitrogen tetroxide or NTO.

Unfortunately there is no information in literature or on internet regarding the end products of this reaction. Based on general chemistry, such reaction should proceed toward some expected compounds like: nitrogen, water and carbon dioxide.

Yet, in case of this reaction, between theory and practice there is an entire abyss. The NTO and UDMH are so reactive that there is no possibility to have a right stoichiometric mixture for these substances. The effective reaction takes place at the interface of contact between these substances, with the excess of one substance and a lot of intermediate species are produced. One has to search in internet for some videos about an experimental demonstration of this reaction. Practically the reaction is performed by dropping small amounts of UDMH or other hydrazine derivative in a NTO liquid and the explosion takes place at direct contact. It is obvious that no one was ever interested to study the intermediates produced in this reaction and their release in atmosphere because such study will conclude that such mixture has to be prohibited too from the use in aerospace industry.

Should we ban in this case the boosters completely?

Of course not! it is necessary to choose the right composition which do not harm the atmosphere although it have a lower thrust.

Or maybe the cosmic tourists are so poor and cannot afford a few hundreds bucks more for a cleaner fuel?

I haven't seen a single study about the use of carbohydrazide as a solid fuel for rocket boosters although this substance can offer a lot of advantages and a much smaller carbon impact.

The chemical formula for carbohydrazide is $OC(N_2H_3)_2$, and at burning it should generate nitrogen, carbon dioxide and water.

$$OC(N_2H_3)_2 + 2O_2 \rightarrow 2N_2 + CO_2 + 3H_2O$$

Even a laymen can spot the huge advantage of using such a compound as fuel for rockets or even for thermal engines.

In comparison with a methane burning, in case of carbohydrazide burning, only one in six molecule of reaction products is carbon dioxide; for methane one in three released molecules is carbon dioxide according to the reaction:

$$CH_4 + 2\,O_2 \rightarrow CO_2 + 2H_2O$$

Kerosene is worse as far there is roughly one water molecule to one carbon dioxide molecule released.

I have not seen a single study to use such substance or one of its derivative in combination with another oxidant in a hypergolic mixture too.

For liquid boosters, hydrazine can have a clean burning when it is combined with oxygen:

$$N_2H_4 + O_2 \rightarrow N_2 + 2H_2O$$

For those supporters of hypergolic mixtures, it is possible to have a combination between hydrazine and another oxidant and a sound choice would be water peroxide. There is also another big advantage for this mixture: both substances are liquids, and there is no need to have low temperatures container as for liquid oxygen.

The reaction between these substances generates again nitrogen and water:

$$N_2H_4 + H_2O_2 \rightarrow N_2 + 4H_2O$$

For the first stage of troposphere launch, such water releasing substances can be used safely as far all reaction products are already components of this atmospheric layer. The thrust is lower I suppose, but one can use a greater quantity of substances without any problem.

This was a simple retrospective of the stage of science in this field and there are many things to be done in order to improve this situation.

This section intends to answer to another question though: ***Is there a possibility to develop another technology for these boosters?***

I am going to advance an analogy with another well known fact in nature because sometimes it is necessary to see if the problem was not already solved and only some scale up and adjustments are necessary.

In water, a squid can move up to 30 km per hour by using the jet propulsion of liquid water.

An inhalant siphon behind the funnel draws water into the mantel cavity via a valve. The squid uses the funnel for locomotion via precise jet propulsion. In this form of locomotion, water is sucked into the mantle cavity and expelled out of the funnel in a fast, strong jet. The direction of travel is varied by the orientation of the funnel. Squid are strong swimmers and certain species can "fly" for short distances out of the water.

Marine biologists from Hokkaido University have measured that some squids are able to propel themselves through the air at up to 11,2 meters per second.

It is amazing how this specie has arrived to such performances and the intelligent humans have not considered the possibility of having a short boost of thrust by using such effect in case of launching rockets.

If one think that such squid performances are puerile, try to do an experiment an make a toy submarine to jump out of water at 10 m/s and you will see the technical difficulties....

By developing such a fluid technology for boosters another simplification in the launching procedure of rockets is possible.

At the moment, any launch of a rocket is preceded by a flooding of the launch pad with water in order to avoid an entire series of negative consequences.

Here is an excerpt from a NASA article about this topic.

https://www.nasa.gov/audience/forstudents/9-12/features/F_Preventing_Fires_on_the_Launchpad.html

Water, Water, Everywhere

Thousands of gallons of water flood the launch area at the crucial moments surrounding ignition, serving two purposes. Water keeps flames from spreading and prevents damage caused by sound waves. Sound waves can cause pipes to burst, walls to crack, and joints to loosen. Damaged systems could lead to more fires because of those leaks and breaks. Water floods the launch area to muffle the sound energy.

The Sound Suppression System protects the orbiter and its payloads from being damaged by muffling acoustical energy -- sound waves -- that could crack and damage surfaces during liftoff. Water stored in a 300,000-gallon elevated tank is released just prior to main engine ignition and flows to the launch platform outlets.

There are six 12-foot high nozzles, called rainbirds. At main engine ignition, a torrent of water flows onto the mobile launcher. Nine seconds after liftoff, 900,000 gallons of water per minute are spraying through the area to reduce the acoustical levels in the payload bay area to about 180 decibels (db). (As a frame of reference, a quiet home emits about 40 decibels of noise, amplified rock and roll music is about 120 db at 100 feet, and a jet plane gives off 130 db at 100 feet.)

The Solid Rocket Booster Ignition Overpressure Suppression System reduces the effect of pressure caused when the solid rocket boosters ignite. A water spray system provides a cushion of water directed down into and around the primary flame hole beneath the solid rocket boosters, and a secondary water spray blocks the path of pressure waves to decrease the intensity of pressure at the launch site.

When you view a Space Shuttle launch on television, the white smoke filling the air is really steam from those millions of gallons of water evaporating. The actual exhaust smoke from the solid rocket motors goes out the other end of the launch pad through the Flame Deflector System.

Well, if some boosters based on jet propulsion of liquid water are used, it is obvious that starting the water booster a few seconds before the main engine, automatically releases enough water to protect the launching pad.

This section tries to advance the idea that a new type of technology based on fluid jet propulsion for the rocket boosters has to be developed.

By sure such technology is going to be more environmental friendly as far is using river or rain water. The technology is envisaged to be used mainly for rocket launching procedure as far there is a need to develop a lot of thrust for a short interval of time.

This technology is only a variation of an idea presented in another newsletter regarding the conversion of a gas pressure gradient to a liquid pressure gradient.

The conceptual design of this technology can be analyzed based on the details presented in fig. 8.

By a certain chemical or physical procedure a high pressure is created into a vessel containing a gas. The vessel has in the inferior part an evacuation opening and a small amount of liquid is all the time present in the inferior part of the vessel.

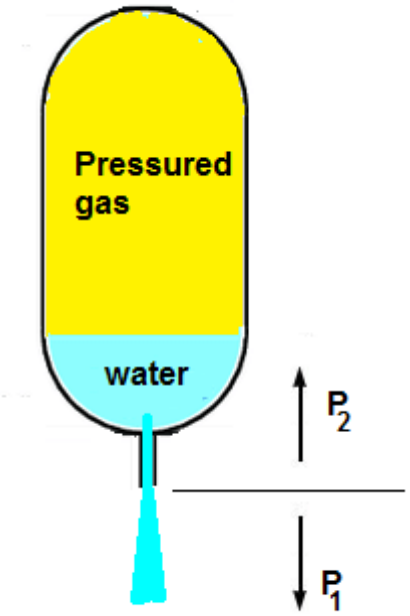

Figure 8

When the evacuation is opened, the pressure of gas will force the fluid to be ejected with a certain speed. The rest is classical mechanic, because the conservation of momentum will push the vessel in opposite direction to the ejected fluid. The grater the speed of fluid evacuation, the greater is going to be the momentum gained by the container.

A simple methodology to generate a gas pressure gradient by physical means is to vaporize the liquid air. If the booster has a container with liquid air, by pipes the liquid air is pumped and eventually heated and delivered to the pressure vessel.

By chemical means the same gradient of pressure is generated due to a chemical reaction. I remind here the decomposition of hydrazine in nitrogen and hydrogen because the products of decomposition does not contain water which can condense in the presence of liquid water and diminish the pressure.

A mixture of physical and chemical means is also possible for creating this pressure gradient.

I think that a gradient of pressure in a liquid can be generated even by electrical means but this need to pick up some electric power from the main engine or to redesign the booster in order to have a source of electricity.

The schematic regards only the working principle, because there are a lot of things to be fixed at this technology. For those who wants to have a pristine atmosphere and an aerospace industry some capital is necessary to be invested in optimizing such kind of technology.

It is high time for humanity to think at sustainable development and not how to study the damages this new developing aerospace industry intends to generate.

The chemistry of upper atmosphere is relatively stable and it makes no sense to destabilize it in order to spend other money in the future to fix it. I have serious doubts that aerospace industry is ever going to fix the damages they produce by burning the dirty chemicals used these days.

Small changes in the upper atmosphere are going to have huge impacts for entire humanity and this cannot be tolerated.

SECTION IV THE π NUMBER AND QUANTUM MECHANICS

Probably a lot of people are going to question if there is a true connection between pi number and quantum mechanic.....

Well, I think that this section is going to become the nightmare of quantum fanatics because a simple analogy with this irrational number is going to demolish the entire foundation of this theory.

The pi number has been known from antiquity by Babylonians and Egyptians, who estimated its value with a certain accuracy. These day we are still calculating its approximate value but with an increased numbers of decimals.

The first systematic methodology for pi calculation was perfected by antique greets and here Archimedes of Syracuse (287–212 BC), one of the greatest mathematicians of the ancient world made a substantial contribution.

Antiphon and Bryson of Heraclea came up with the innovative idea of inscribing a polygon inside or outside a circle, finding its area, and doubling the sides over and over. "Sooner or later (they figured), ...[there would be] so many sides that the polygon ...[would] be a circle" (Blatner). This was most likely the first time that a mathematical result was determined through the use of upper and lower limits. Unfortunately, the work became to complicated with an increased number of polygon sides, and they stopped at few digits after decimal point.

Archimedes used a slightly different method than Antiphon and Bryson: he used polygons' perimeters instead of their areas. He started with an inscribed and a circumscribed hexagon – fig. 9, then doubled the sides four times to finish with two 96-sided polygons.

For those interested in this topic here is a link with a detailed discussion:

https://mathshistory.st-andrews.ac.uk/HistTopics/Pi_through_the_ages/

In order to increase the accuracy for the pi value, from mathematical point of view it make sense to continuously increase the numbers of polygon sides.

When the number of sides tends to infinity, then, the polygon becomes in fact a circle and in this case the best estimate for the pi value is obtained.

Yet, physics is different from mathematics, although no one can imagine a consistent foundation for physics without a mathematical background.

The idea of quanta, introduced by Max Plank more than a century ago, needs an entire article in order to see how absurd this idea appears from the perspective of a laymen and this will be done in the near future.

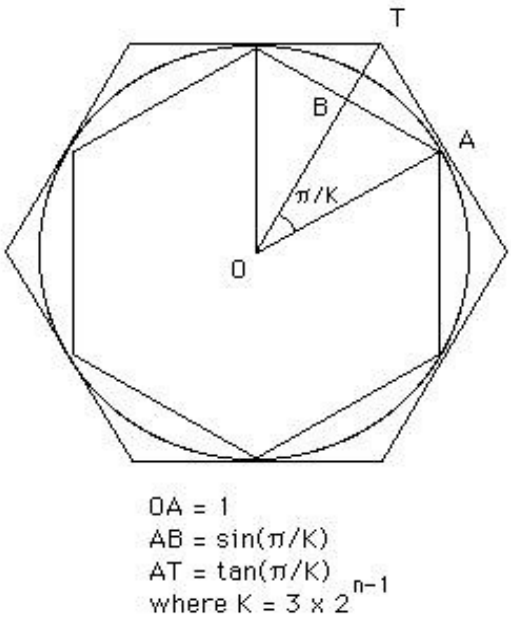

Figure 9

For the moment a short general introduction about this concept is provided at a level of pupils understanding.

Around 1900, Max Planck was working on the problem of emitted radiation by a heated body. As far the measured data did not fit to the theoretical expectation he came up with a formula that agreed very closely with experimental data. That formula made sense only in case the energy is supposed to be emitted in „chunks" and supplementary each chunk of energy is proportional to the frequency.

Although today any mediocre scientist glorify the idea and make the usual polish for Planck shoes, his peer colleagues and physicists did not embrace the idea easily. The fact that quantum theory became one of the „the most exquisite theory" in science was possible mainly because Bohr incorporated the quantum idea in his atomic model. There is also a smaller contribution coming from Einstein, who has to be congratulated for messing up the entire physics with the absurd idea of light being in the same time a wave and a corpuscle.

In Planck's words, energy is "made up of a completely determinate number of finite equal parts, and for this purpose I use the constant of nature h= 6.55 x 10^{-27}(erg sec)". Moreover, he continued, "this constant, once multiplied by the common frequency of the resonators, gives the energy element epsilon in ergs, and by division of E by epsilon we get the number P of energy elements to be distributed over the N resonators".

In a letter written in 1931, he further explained that the introduction of energy quanta in 1900 was “a purely formal assumption” and he ,,really did not give it much thought except that no matter what the cost, he must bring about a positive result”.

In essence the solution offered by Planck was, as he underlined later, ,,an act of despair”, a desperate tentative to fit the observations with theory, and it was quite similar to that offered by Pauli when he invented neutrino.

Well, the expansion of neutrino research has already been stopped by a ,,savage and uneducated person” and I do not think that some spoiled scientists are going to revive the field ever!

The time has come for the quantum theory too and I do not think that this theory is going to survive another year.....

First of all, it is necessary to observe a first paradox in quantum mechanic: **a quanta of energy has a variable size, but a a quanta of momentum (angular, spin, possible linear) has a constant value.**

This paradox can be spotted and grasped by pupils, if the quantization condition for hydrogen atoms are analyzed:

$E = h\nu$ – one quanta of energy

$L = nh$ – n quanta of angular momentum.

For n= 1 there is a single quanta of angular momentum and for an increased n there are more angular momentum quanta. It is obvious that angular momentum quanta is all the time equal with h constant.

Has someone ever questioned this situation? why the quanta of angular momentum is all the time constant value and equal with h constant?

Well it is not only a paradox, but a complete inconsistency from both mathematical and physical point of view and this is going to be demonstrated later. This is a fake in order to arrange the results to fit to experimentally observed spectra lines for hydrogen.

Let us go further and consider for simplicity that the trajectory of an electron around an atomic nucleus is a circle. In any point of this circle, a central force is acting on the electron and it changes its trajectory. It is obvious that from mathematical point of view there are an infinite numbers of points on the circumference of a circle and consequently this central force has to act in each of these points in order to be consistent with the real motion of the electron.

From mathematical point of view, it is very complicated, if not impossible, to solve a problem where the infinity is already a ,,known” input and somehow one has to look for the output. So, the procedure of solving this problem was to start thinking backwards and consider the situation for a single point and expand it back to the entire circle or to an ellipse.

The motion of a particle under a central force action is a well known topic in science. Hooke advanced the first consistent model in case of our Solar System and Newton perfected the mathematical formalism and up to these days he took also the entire recognition; Rutherford and later Bohr worked for a similar model in case of an atom. Well, Bohr introduced the quantum idea and the quantum theory has a more complex approach for the atomic structure, but in essence, any quantum model assumes that electrons around nucleus have a motion under the action of a central force.

To my fortune the fathers and now grandfathers of quantum theory made an astonishing imbecile assumption.

The quantum theory came with the outrageous idea that any phenomena at atomic level are quantic, i.e. they are not continuous but take place in some small chunks called quanta.

For example the angular momentum of an electron on its trajectory around nucleus has not a continuous variation but a discrete one, i.e. an integer multiple of h value, where h is Planck constant.

The direct consequence of this assumption is very important for the physical world. This is the second quantum paradox: ***the quantified motion of a particle around a center of force (in our case electron) cannot be a continuous curve.***

For a laymen understanding the electron cannot move like an ant on the circular trajectory but as a grasshopper in small jumps. Supplementary, nothing can affect the jump of an grasshopper, and all jumps have to be equally in size. A real grasshopper cannot be convinced to do such thing but one has to imagine a toy grasshopper powered by an electric battery.

For simplicity and because I like hexagons, let us consider that an electron angular momentum around a nucleus has six quanta - fig. 22. A greater number of quanta only complicate the situation but not changes the approach and the conclusions. For fun, in a future discussion the case of an electron having an angular momentum of only one or two quanta is going to be presented too.

Arbitrary, the electron is considered in point A and starts its journey with a quantum jump up to point B.

The form of electron trajectory (if one can assume there is one!) between points A and B requires an entire article and has to make appeal to some variational principles from analytical mechanic. Such discussion is by far too complicated for a widespread newsletter so we are working with some simplifications here.

In fact, for the moment, it is irrelevant the exact path followed by electron between points A and B as far nothing can affect the quantum jump; for simplicity, one can assume that quantum jump take place directly along the polygon side.

The electron can be affected only in the initial and final state of this quantum jump, i.e. when it is found in point A or point B as in fig. 10.

This situation introduces another paradoxical situation in quantum theory: **the so called electric force can act on electron only when the electron is in the initial and final state of its quantum jump.**

If the central force would act continuously on electron, for each point between A and B, then anyone has to say bye-bye to the quanta of angular momentum.

For a laymen understanding if central force can affect the motion of electron during a quanta jump, then such quanta can be divided in smaller units and this fact rules out the entire quantum theory.

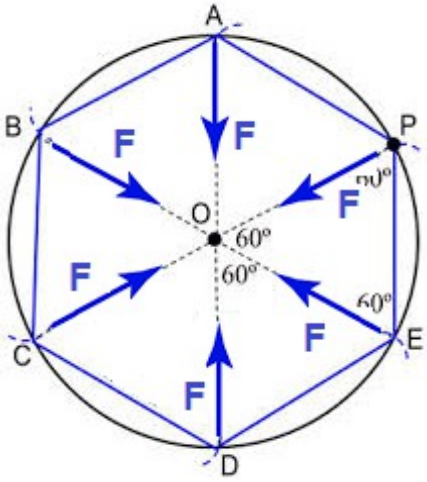

Figure 10

On the other hand, if the force acts only in some points from the electron trajectory, in our case A and B points, the entire physical model and the already written mathematics behind the present day atomic structure, is a complete nonsense.

There is a third paradox of quantum mechanics too:

- **for an electron on orbit the angular momentum is quantified and its energy is non-quantified.**
- **during a quantum jump the energy becomes quantified and the momentum non-quantified.**

This situation is exemplified in fig. 11

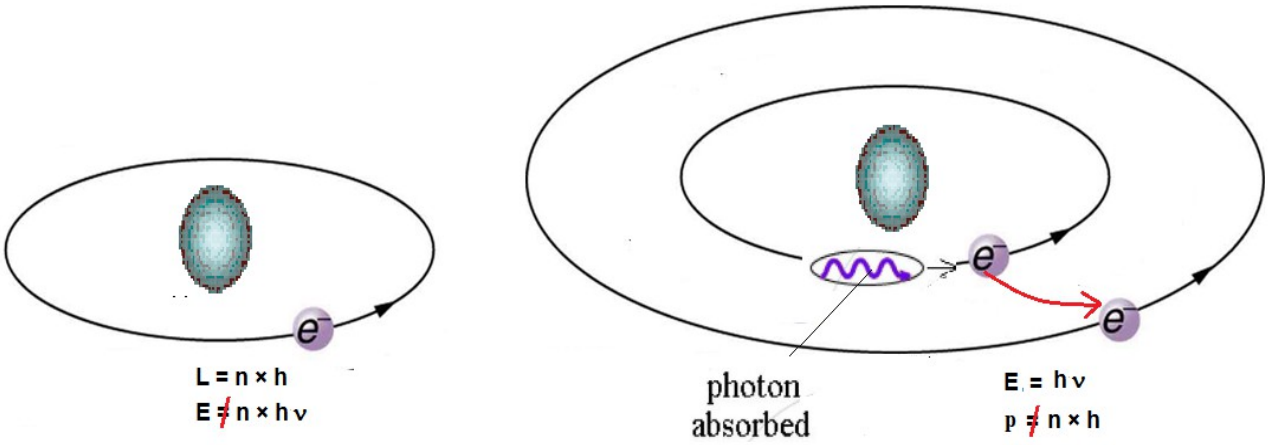

Figure 11

There is no need to come with a new „demonstration" in order to exemplify the situation presented in fig. 11. One can look at the estimation of the electron energy moving on a orbit in Bohr theory or any other successive advanced quantum theory.

In contrast to this situation, when an electron jumps between two orbits, there is a supposed quantization of energy and a non-quantization for angular momentum. During the quantum jump a variation of „linear" momentum can be taken into consideration too, and there is no clear idea if this is quantified.

The variation of angular momentum and non-conservation of this unit during a quantum jump represents the forth paradox of quantum mechanics. The conservation laws require that angular momentum of electron to be conserved before and after this jump. This conservation law practically rules out the rules established for how the electrons fill in a shell and sub-shells.

Each and any of these paradoxes rules out the entire quantum theory and this fact has to be clear even for pupils,

The Bohr and his acolytes have advanced an inconsistent mathematical and physical model in order to fit the theory with the observed line spectra for hydrogen atom. Further on, the quantum fanatics have continued this work to a high degree of meticulousness and in this moment there is a magnificent quantum theory which is in fact a crass imbecility.

I hope that quantum theory fanatics pop up with some details about which physical unit is quantified and how.

It is impossible to reconcile the quantization of more physical units for the same particle in order to have the same size for this ,,quanta" though!

I suppose that a new brilliant theoreticians comes up with a new quantum principle: ***from a set of physical units which characterize an electron, only one at a time can be quantified.***

In this case, at least theoretically, it is possible to have a consistent description for electron motion around nucleus and for electron jump between orbits.

Well, for any other common sense mind this situation would appear unacceptable

A new theoretical frame about atomic structure was started a couple of decades ago and it is high time for it to be expanded and replace the present imbecile quantum theory.

In a previous newsletter about nuclear reactions, a new postulate was formulated and the idea remains valid for electronic structure too if the situation imposes. I am going to switch the corollary and the postulate, as far for the future theory the corollary is going to be more relevant.

Postulate: Momentum conservation determines the redistribution of energy.

Corollary: The conservation of linear momentum during a so called quantum process (jump) rules out the process of energy quantization.

In the new proposed theory, there are energy levels in the atomic structure but this constraint does not impede a ,,classical" approach for the atomic structure.

Well, the conservation of angular momentum is necessary to be taken into consideration too when the electron jump between orbits, and probably a new postulate is necessary here.

With the first occasion, the supremacy of quantum computing is going to be analyseed too.

When huge amount of money are poured into an imbecility, some poeple have to justify those spent money and of course special problems and solutions are ,,invented". They should start with simple arithmetical operations though.....

For US and UK quantum supremacy is a national priority. Google AI has already announced that their powerful quantum computer defeated the classical computers by some astronomical difference. EU has a quantum technology flagship and in fact 80 billion euros in the Horizon 2020 were dedicated mainly for quantum development in a hope that Europe will catch up with US. Well, soon enough someone will draw the line and conclude that this money were spent for nothing. But as far the EU central bank can print other Euro at their will, this is not a problem....

It is going to be interesting to see how a set of lasers and mirrors has beaten a supercomputer - which is in essence a marvel of technology and the backbone of modern society.

SECTION V OLD GAME, SAME SCENE, NEW ACTORS AND FIGUREHEADS ….

In a previous section, I made a short presentation for the Papin case in order to see what lesson of history has to be learned.

Of course, I am going to continue the investigations and write a book about the Papin`s life. I hope that some French organizations or individuals are going to support this initiative.

By sure the life of a genial man deserves a book; by comparison, some people considered necessary to write a book which analyses only the origin of the expression used by Newton „ by standing on the shoulders of giants".

I hope that some German and UK organizations are going to support a much larger project to write a more objective version of the XVIIth century events based on the documents available.

And now it is important to make a comparison between what happened three centuries ago and what happens now....

At that time there was only Royal Society which sabotaged Papin, for some small reasons which by sure are going to surface soon ….

In our days, and for a quarter of century, a crowd of imbeciles, occupying key positions in society, have been preventing an intellectual revolution, i.e. a change of the entire foundation of exact sciences.

This crowd is composed mainly by the present intellectual elites but legislatives and executives are part of the plot too.

The European Commission is a representative example which needs a special attention. They are meant to ensure progress and stability for the European Union and steward the interests of European citizens, but in reality they are doing the opposite. In the past, I filled in a complaint against European Commission without any positive result, there is still a petition to the European parliament, but as in the Savery times, it is so simple to pass by these things and cover everything in a bureaucratic procedures.

Of course, from their point of view, no one sabotaged me! They were doing their jobs only and they were only doing with a bit of excess of zeal their jobs! Can someone accuse such people that being well paid, they were doing the jobs even more thoroughly as it should have been done?

The academies and other representative institutions (universities, research centres) all over the world are part of the plot or in any case they tacitly tolerated it. I remember sending a paper for publishing to the Australian Academy of Science around 2007-2008 and they refused publishing it on the reason they do not understand the English in the article. I kept the original version of the article on the website (about covalent bond - the atomic book) and although there are some grammatical errors, the idea can be spotted easily. Anyway, after correcting the article by a professional English speaker and resubmitting the corrected article, they did not ever answer to my email.

Any such representative institution, in a direct or in an indirect way, has took part in the plot, by not doing what they were meant to do!

The Romanian Academy, which should promote the national values, including this theory, did the worse job in its history. There are available about 40000 Euro each year for an academician to be spend on indemnity and other expenses, but one Euro for this theory could not be found! Well, don't imagine that an academician lives only from the money coming from Academy!

Of course, all the present Romanian academicians have been schooled in the wealthy western society and they are in contact with the intellectual elites; in fact, they have been paid directly or indirectly by these elites to keep their mouth shut and do nothing for promoting this theory. For a few thousands euro, they can be bought anytime at „their real market value". They have forgotten that they should represent the cultural elite of a nation and in the same time to be a model for the young generations.

It is important to be highlighted what is at stake for the entire society in this modern plot...

Well, it is impossible to quantify at this moment what this new theory in economic terms really means! I am going to exemplify what does it mean only for a part of the energetic sector. Again, I do not make the estimation for the entire energetic sector, but only to highlight the consequences for the simple application discussed today, i.e. a simple change of a fluid in a power plant without any other investment. We have shown that by doing such small change, an amount of 3000 TWh (from coal and nuclear) could have been produced „from thin air" at the level of production estimated for 2016.

Ok, „from thin air" it does not mean I got it from my pocket, it is only the result of a technological improvement.

At a cost of production of about 0,1 Euro per KWh, that amount would have represented 300 billions Euro for 2016, i.e. more than entire GDP of my country.

What do you think now? Would someone want to kill for this fortune? If you say no, then your are completely torn from the reality! 99% of the human population in these civilised times would do it with the first occasion if they are sure not being caught!

Attention, this is not a new technology in itself...it is only a small detail which was left aside by an imbecile science...

What can a real new technology of electricity production bring, is going to be seen in the future....

Anyway, there is going to come a time when any company in the electricity field is going to be asked why did they, directly or indirectly, opposed to a switch in the technology!

The direct consequence of not implementing these technologies is seen in climate change and industrial pollution. Of course many people, especially politicians, make a lot of noise about these topics but all the strange measures they want to implement have to be supported by citizens.

The new theory comes with solutions to at least alleviate this burden on the citizens shoulders; but, do you think that this is important for a bunch of corrupt or lazy bureaucrats?

Even a laymen could understand that society as a whole is already losing because these technologies are not implemented.

I am not going to lose because the royalties for the electricity production are going to be recovered for me starting with 2010. Supplementary the new technologies are going to remain as

intellectual property and never as brevets. Someone in the field of intellectual property knows what the difference is….

If a country wants to have progress and real scientific research, then it is high time to think in the future.

Let us see what the consequence of this organised plot for the educational system are!

At least 20 generations of pupils, scholars, students and teachers were indoctrinated with a wrong scientific background and for most of them it is going to be impossible to switch to the new one. There are other generations coming from behind and although theoretically it is possible to ,,re-educate" these lost generations, in practice this is not going to happen.

Although there is no doubt that this new theory of science is going to become the foundation for the future progress of humanity, this theory is only in its initial stage....

In the view of opposed resistance from the imbecility of elitist intellectuals, I was forced to dedicate my scarce time to bring up new experiments and facts which could demolish or rule out the present accepted dogma, so the ,,proper" development of the theory is lagging behind. If for example, the theory is going to be accepted tomorrow, there is a huge vacuum in many branches of science which cannot be filled over the night.

As already presented with another occasion a period of at least five years is normally necessary for having new manuals, new teachers and so on. If the society as a whole afforded to be careless about such transition, this period is going to be extended accorded to the rules defined in a previous newsletter.

How many lost generations can a society still afford? And who is going to be charged guilty for this disaster?

Another major loss for the society as a whole is related to research expenses.

The amount of money spent on futile research in this lost quarter of century is difficult to be imagined. At national level, for a developed country, there is about 5% of GDP dedicated to research. This is money from budget dedicated to fundamental research by the grant system. If one considers the private and industrial research, the expenses are bigger. In a quarter of a century, each developed country has thrown away at least the equivalent of a GDP....

Of course some are going to argue that part of these research are applicative research which remains valid even the foundation changes. This is true, but now there is necessary other input of money to clean up the mess and decide what is going to remain and what is going to be discarded.

If this step were to be done a quarter of century earlier, tons of junk literature would have not been written and the transition would have been simpler...

Does someone think that such process can be performed over the night and with a team of few people?

Where are these people coming if the entire community is indoctrinated with imbecilities?

So, even for research there is going to be a discontinuity period according to the rules defined in a previous newsletter.

In a future newsletter, there is going to be a broader presentation about the purpose of this theory and what are the targets....

First of all, each living person should ask himself what price would (s)he pay that his/her offspring have access to this theory.

A real price, from my point of view, would be as follows: one generation of his/her offspring work for me, in the same conditions I have been working for decades and paid as I was paid. When his/her offspring have generated at least 1% of what I generated, then they are free to have access to this theory for them and for their descendants.

If they are not able to generate in one generation that 1% of what I have generated, the contract extends in the same conditions for the next generation and so one.

What do you think about this bargain? Would you be interested in it?

The difference between a great man and a common one can be seen in these conditions.

What is going to happen when a great man acquires the power? Would he change something for the future or will he use the power only to get revenge for what happened to him previously.

The Newton – Hooke case can be framed as a classical example for what happen when a tyrant got the power in his hands....

We imagine that such repetition of things is not possible in democracy but this is false. In a democracy these things happen all the time, but they are hidden.

Beside professional harassment, for a quarter of century I was hunted by ,,imaginary ghosts" because when the entire system is against you, the danger comes from everywhere.

A simple walk in a beautiful but uncrowded place, in a second can become a place where your life is endangered. A simple theft can appear as an accident, but these are only appearances because few (if any) such occasional acts are done for documents. Or maybe in the latest times many thieves want to improve their scientific knowledge...

Probably the most tranquil period I remember was when I worked as a chemist for a half year to a cannabis cultivar in Switzerland. Unfortunately, this tranquillity suddenly disappeared when in a Sunday morning some gunshots outside disturbed my intellectual preoccupations. By sure I did not want to be a collateral victim in another war so this was also a reason I quit soon that job. Of course I was not keen to be part of such insignificant conflict either....

In a dictatorship, a dissident knows where the danger is coming from. In a democracy the danger comes from everywhere.

Of course there is police but they are only to serve the system and to register the facts; they are not to prevent such situations.

Such direct or indirect pressure would drive any normal person crazy and would make it slip into paranoia and mental derangements. Boltzmann arrived to suicide for much less pressure and of course there was no one to see why such a person arrived to such desperate act. Now, a new generation of brian washed minds are praising Boltzmann achievements in thermodynamics.

Unfortunately for this bunch of criminals, I have trained myself to endure this pressure and overcome any situation.

Of course in such situations a strong believe in a ,,upper" protection is crucial; I always had an internal feeling that there is a greater purpose behind all these events and maybe someone

incarnate in this life in order to change these things and show another path to be followed in the future.

What would you think if your offspring would live in these conditions for decades?

Aren't you happy that the modern democracy we have build has tried to eliminate the greatest mind of humanity ever?...

…..and no one is guilty!

Is someone in a hurry to unveil another commemorative plaque for me and I did not know ?

This is not a new thing in history. The first democracy in Athens, succeeded in killing one of the most outstanding personality of that time and of course no one was charged guilty.

In the meantime they have learned to keep secret these things though!

The purpose of this theory is to change a lot of things in the world, starting with environmental aspects, education, research and development, sound and sustainable economic rules and up to some social aspects. Do not worry, it is not the purpose of this theory to change a political system!

As Romanian, it is going to be a priority to buy my country back for Romanians and to make it entire.....

Now, my country is chopped and has become only a colony for the mercantilism of a mad society.

I hope that God is going to help me to transform my nation in an example to be followed by others, in their way toward progress and spirituality.