FAKING THE SCIENCE FOR PUPILS - PART III

Motto:

What humiliation can be greater for an entire elite of intellectual criminals than seeing centuries of hard work and the entire modern science ruled out by an experiment performed with a museum exponate at zero cost?
How long the society will prize these intellectual criminals instead of condemning them?
How long the society is going to indulge itself in promoting imbecility as a modern form of science?
By sabotaging me these intellectual criminals have condemned in fact the entire human society and the effects are going to be seen when the recovery has to start.....
I am writing only for the future, because humanity needs another one ....

I would like to mention from the start that this newsletter is not discussing about black holes and the 2020 noble prize in physics! I cannot spoil the party and deny to these laureates a bit of fame they are craving for long time, so this topic is postponed for the following newsletter.

Anyway, after solving the enigma of gravitational waves faked signal, now it is high time to speak about 2019 nobel prize in physics. Consequently, this newsletter has some sections dedicated to Mr. Peebles, although I do not think he deserves so much! Maybe someone would like to help me to find at least one of his original contribution to the modern science because in his long list of published fictional garbage, I found none!

I would like to advise the nobel committee that prizing imbecility is fun, but they should pay also some speech writers for helping the laureates to deliver some more consistent and nicer presentations during the festivities.

In case of Mr. Peebles, it was painful to see a nobel laureate who achieved nothing in science and the only relevant information from his presentation were some photo with other nobel laureates or how he reinvented the wheel.

Coming back to more serious things, the present newsletter is still insisting on thermodynamic topics because this fake branch of science has brought humanity on the dangerous slope of autodestruction and for any common sense mind this has to be the starting point of any renaissance.

Section one presents an experiment advanced by me about a decade ago and performed by a team from Museum Geneve. They used an old Watt engine to be powered by compressed air instead of steam, and the engine is producing mechanical work in absence of any source of heat. This is going to remain one of the most representative experiment in the XXI century science because it rules out the entire thermodynamic science with zero costs for the experiment. My old article with

some grammatical correction is added to the newsletter too and one can make a comparison with the original article kept on the website.

The second section is about early atmospheric steam engines and there, it is demonstrated in a simple but elegant manner how an entire class of steam engines, the so called **atmospheric steam engines**, are ruling out again the entire imbecility of second law of thermodynamics and of course the rest of modern thermodynamics.

For close to a century, the so called atmospheric steam engines were the only available type of steam engines used in producing mechanical work.

Although the idea of the first piston engine conceived by Denis Papin before 1690 was sound, the performances of his first model were not suitable for implementation in production. Yet, some improvements, increased dramatically the performance of this engine.

The first improvements regards the separation of boiler from engine and the internal condensation of steam. These invention have been fraudulently attributed to Thomas Newcomen. As described in a previous newsletter (the process of information faking part I), Denis Papin was killed and his documents stolen in order to have the plans for his latest steam engine. It is going to be a further detective work to uncover (if possible!) how Thomas Newcomen got the plans for this advanced steam engine and the implication of Isaac Newton and his acolytes in these events.

Other relevant invention was made much later by James Watt, who separate the condensation of steam from the cylinder engine.

A detailed discussion about the atmospheric steam engines is provided because it is high time to refurbish and put them at work again! There are many technological processes in a lot of industries where steam is a byproduct and usually it is condensed to liquid with heat release into atmosphere, without any gain...

The third section analysis how the steam from a common power plant (coal, petrol, nuclear) can be used for generating another surplus of electric energy by using the condensation of steam effect to produce mechanical work. Here it is very important to be underlined that mechanical work is generated by the fact that steam is condensed and the atmospheric pressure is in fact generating the work in order to compensate the variation of pressure in the cylinder.

The heat of condensation or the heat of evaporation is going to be used as a tool in establishing the relationship between heat and mechanical work.

For a pupil understanding things are very simple; not so simple for some theoreticians in the field, though!

Assuming that 1 mole of water and one mole of acetone are either vaporized or condensed, the heat consumed or recovered is much different, but the variation of volume is quite the same.

The molar heat of vaporization for water is 40,7 kJ/mol, but for acetone this is 31,0 kJ/mol. By evaporating a mole of water and a mole of acetone the variation of volume is quite the same. In gaseous state, a mole of any substance occupies a volume of 22,4 litres. Of course this volume is considered for ideal conditions and real conditions are a bit different from the ideal one.

By taking in consideration the departure from ideal conditions for water and acetone, and by taking in consideration the fact that in liquid state the volume occupied by one mole of each substance is a bit different, there is a flagrant discrepancy between the mechanical effect generated by one mole of each substance and the heat of evaporation or condensation of these substances.

In a laymen words, the consume for vaporization of a water mole needs about one third more energy as for acetone, but the mechanical work generated is quite the same.

The same thing happen in condensation. By condensing a mole of water more heat is recovered as for acetone, but the amount of mechanical work is quite the same.

This line of research like many others, has to wait until some imbeciles having key position in science die and they are replaced by some new intelligent ones. If the process is going to continue as in present days (imbeciles replacing other imbeciles), then the humanity is condemned to wait longer.....

The forth section shows how to put at work the nuclear garbage produced by present day nuclear reactors. When fuel rods in a nuclear reactor are no longer usable because the heat released is less than optimal heat for the reactor needs, they are removed from the reactor core and replaced with fresh fuel rods. The spent fuel rods are still highly radioactive and continue to generate significant heat for decades. The fuel assemblies, which consist of dozens to hundreds of fuel rods each, are moved to pools of water to cool.

This newsletter advocates that such garbage as far it is still producing thermal energy can be used for producing electrical energy.

Well, instead of storing these spent fuel material in water, a better solution is to store them in chloroform or another convenient freon with a lower boiling point and a lower heat of vaporization.

Instead of consuming energy to remove the heat from the spent nuclear material, in this new design the heat is used to boil the chloroform which further is used to produce mechanical work.

The fifth section demonstrates the imbecility of mass energy conversion formula based on some nuclear reactions. In fact, for a laymen understanding the nuclear physicists have to turn back to the drawing board because entire particles (electrons) are missing in case of both alpha and beta decay reactions. These theoreticians have to learn how to write a chemical or nuclear reaction first and after that they can discuss about thermal effects.

A new postulate is exemplified here too.

Postulate: Mass and energy are completely different physical units.

The sixth section presents the first nuclear incident in the Universe, which took place immediately after the Big Bang, i.e. the deuterium bottle neck. This is a parody to the imbecility of Big Bang theory and in the same time a special dedication to Mr. Jim Peebles - the 2019 nobel laureate for his contribution to cosmology, mainly Big Bang theory and other smaller imbecilities.

The seventh section is about nuclear stability and an introduction to nuclear reactions. It is a parody to the boys farm for whom a special units was introduced in physics, i.e. the barn. The section demonstrates for a boy farm understanding that things are out of control and another path has to be find for the future.

The eighth section describes a new effect and only its title is going to scare the GR fanatics, because it describes static and dynamic time delay in GR.

A new postulate is presented and exemplified here:

Postulate: Any change in the space-time metric affects the measured distances and the temporal order of the events in that region of space.

The ninth section dedicated to Mr. Peebles analyses his remarkable presentation at the nobel prize gala.

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 ONE OF THE XXIth CENTURY REPRESENTATIVE EXPERIMENTS

I would like to start this section with a piece of information which has become serendipitously available.

About a decade ago, I advanced the idea that a steam and/or an internal combustion engine do not convert heat into mechanical work; these engines are working based on a pressure gradient and heat exchange is only a secondary factor which can amplify or diminish this pressure gradient.

At that time, I argued that a steam engine can be powered by a simple bottle with compressed air and I also described how this engine works in these conditions.

Of course, I wanted to procure a working model of a steam engine in order to demonstrate that assumption, but I could not find such a model at an affordable price.

The entire scientific community has been making a title of glory for them in sabotaging me directly or indirectly, by any possible means, so to look for some support from their part was only a a futile effort from my part.

Of course, at that time, I realized that it would be a waste of time to stay limited to this topic and wait for the „scientific community" to recognize the importance of this experiment for science. As far in my mind there were hundreds of other ideas, some even more valuable as this one, it is obvious that I switched to other topics and an entire list of articles and newsletters has been published in the meantime.

Now, in October 2020, I was looking for some materials about the history of these early engines and I found, by chance, this video on youtube which demonstrate exactly my point of view.

https://www.youtube.com/watch?v=1jVOTBZWkY4

The video is entitled ***Watt steam engine*** and the demonstration is made by someone from the Muséum Genève. There is no voice presenting the experiment, only written text. Anyway, it is highlighted that: **a *Watt steam engine is powered with compressed air in order to protect the engine and for safety reasons*.**

Well, the team from Muséum Genève was not looking to do research and prove the present theory of thermodynamics wrong; they were popularizing a valuable piece of their collection and they were using compressed air in order to not damage this valuable piece (inventory number 78).

It is well known that steam has a more corrosive action on steel as air and one have to bear in mind that steel at those times was not the same quality as the steel in our days.

Without knowing, they have opened a can of worms for thermodynamics and for the entire modern science ….

I am sure that some illustrious imbeciles, with key decision power, would be interested to make this video lost, so more copies of it are already downloaded in my archive. The video is going to be uploaded on my website in case such sabotage happen again....

In fig. 1 a frame from this video was extracted for exemplification.

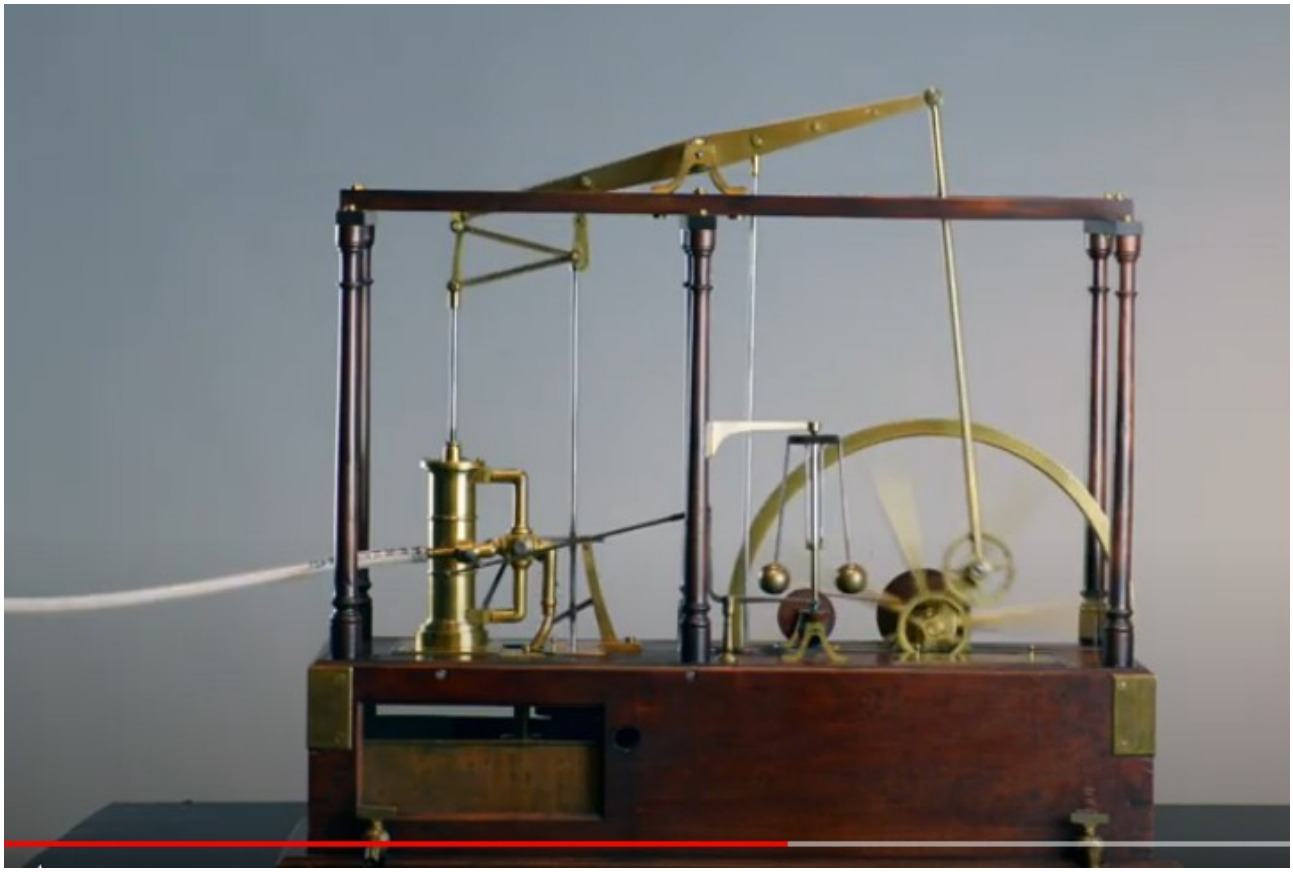


Figure 1 Museum exponate steam engine working with pressured air

My original article describing this experiment can be found at the following link: https://www.pleistoros.com/en/books/thermodynamic/steam-engine-and-carnot-formula

As anticipated in my article, anyone can see in the video that a pressured gas can power a steam engine without any problem, without any supplementary adjustments.

Well, maybe some theoreticians in the field are going to explain how this engine works and what heat is converting into mechanical work?

According to modern thermodynamics, a heat engine is a system that converts heat or thermal energy into mechanical energy. It does this by bringing a working substance from a higher state temperature to a lower state temperature. A heat source generates thermal energy that brings the working substance to the high temperature state. The working substance generates work in the working body of the engine while transferring heat to the colder sink until it reaches a low

temperature state. During this process some of the thermal energy is ,,converted" into work by exploiting the properties of the working substance.

In fig. 2 a simplified diagram of such a heat engine is presented.

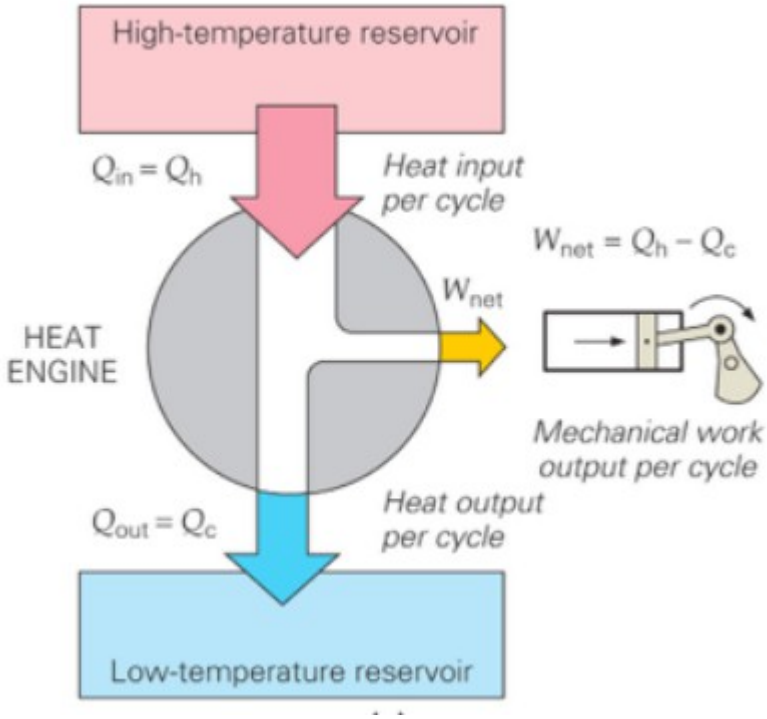


Figure 2 Schematic diagram of a heat engine

The efficiency of an heat engine is defined as the ratio of the heat extracted from the hot reservoir and the work done.

Well, by powering a heat engine with a pressured gas bottle, there is no heat to be converted into mechanical work.

Such heat engine should not perform any mechanical work in these conditions!

Yet, the engine is doing well, and I suppose with a bit of adjustments, it can have a better yield in these condition in comparison with the same engine powered by steam.

In fact as gases expands, this engine works with heat absorption from surroundings and I suppose it is a simple task to measure the variation of temperature during this engine functioning....

The question is, how many generation of youngsters have to be completely tormented with imbecile ideas in a simple field like thermodynamics, when to prove these imbecilities cost nothing.....

It is hilarious to see how an ,,historical" experiment performed for advertisement or for amusement in a museum demolishes the entire modern thermodynamic and the entire modern science.

Yet, professors with Ph. D. in physics from top universities in the world still would like to pop up and present with nonchalance some imbecilities as being the latest absolutes truths of the universe.

From the perspective of new theory, this is an experiment which is worth at least ten „normal" nobel prizes; well, I mean ten „normal" nobel prizes because having in mind the imbecilities which are prized lately, the experiment is worth at least a hundred such inflated nobel prizes.

The experiment is going to remain in the ***history of science as one of the most representative experiment of the XXI century.***

Some people still think that spending huge amounts of money on imbecilities would bring them an advancement in science when, in reality, the opposite is true; science has become a collection of more or less subtle imbecilities and it is time to stop the process and restart it again with another foundation.

It is obvious that not all the credits for this representative experiment can be attributed to Geneva Museum; yet, they have to be reminded that they performed the experiment as an advertisement for their precious exponate and proved my theory right.

In order to get credit it is normal that an institution or an individual has to manifest an interest to perform such experiment with the purpose intended by my theory.

In the up presented case, it was a pure coincidence that my purpose and their purpose were in synchronicity.

I am going to write the museum director to offer them a collaboration for the future; they have by sure many interesting exponates which can be used to wipe out the imbecilities preached and prized by modern science.

The extension of the consequences this experiment brings for thermodynamics and for science in general are going to be presented in a future newsletter.

The experiment rules out the second law of thermodynamics and questions the relation between energy (heat) and mechanical work; this means that these basic concepts and even the formulation of the first law of thermodynamics has to be revised too - some insights are provided in section 3.

The consequences are a bit dramatic for mainstream science: more than three centuries of hard work in thermodynamics have to be ruled out and everything has to be started from scratch again ….

Here bellow, one can find the old article about this topic, with some corrections to the grammatical part.

Steam engine and Carnot formula

Background and actual interpretation

According to actual interpretation, engines are devices that consume fuel (coal, gasoline, diesel, alcohol, etc.) and converts heat into mechanical work.

The first steam engine was invented in ancient times by Heron of Alexandria. Much later, towards the end of the Middle Ages, a rudimentary steam engines was invented by Denis Papin, and mainly used for the removal of water from coal mines. Significant improvements in these primitive model were made by James Watt, Richard Trevithick, etc. and the steam engine began to be used in a wider range of applications starting from spinning and weaving textiles up to rail or sea navigation. Practical development of the steam engine led to what history calls the industrial revolution.

For the first prototypes of pressure steam engines, steam pressure is exerted on one end of the cylinder to move a piston. In the improved version, both ends of the piston are used to produce mechanical work, and therefore these motors are also known as double-acting.

We analyze in detail the working principle of a double-acting steam engine.

The steam coming from a boiler is guided through a pipe A to the inlet and enters the body of the motor C to the left side of the mobile piston E – fig. 3. The path of steam is featured with red for admission and blue for refulation.

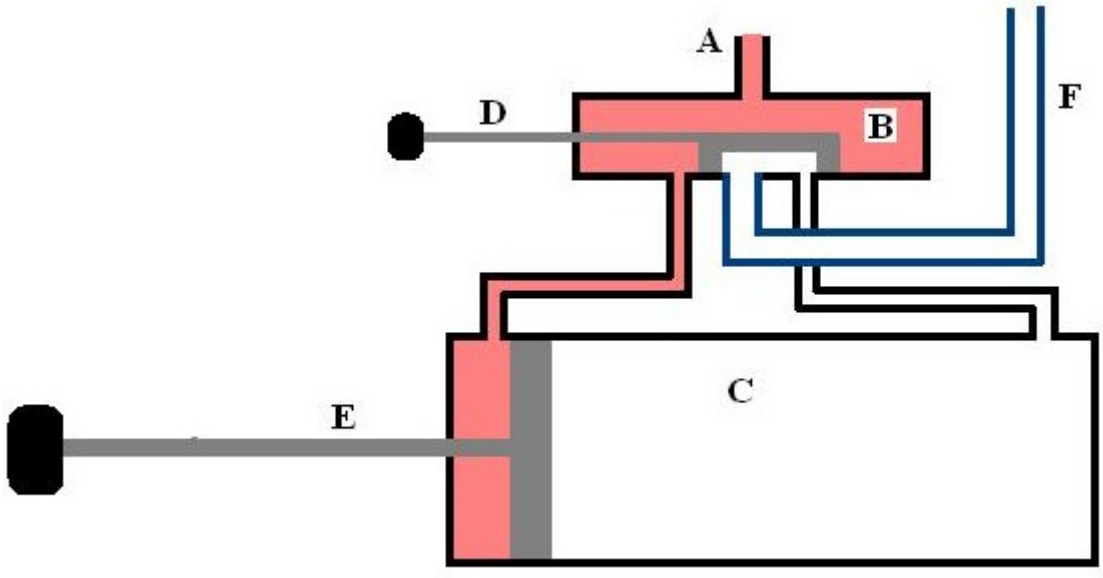


Figure 3

The steam pressure will exert a force on the mobile piston and therefore it will move it to the right - fig. 4.

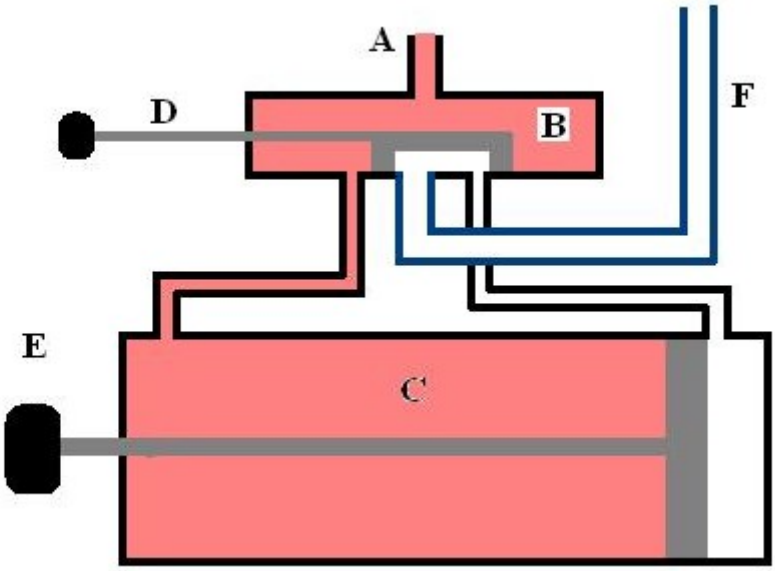


Figure 4

Valve D moves to the left (fig. 5) and blocks the inlet of steam to the left part and in the same time open the way for steam into the right chamber of the engine as far the piston has already moved to the right. In the same time the valve D connect the left chamber of the piston to the atmosphere through an exhaust port, resulting in an equilibrium of the pressures, excess water vapor in this way is transferred to the air producing a specific whistle.

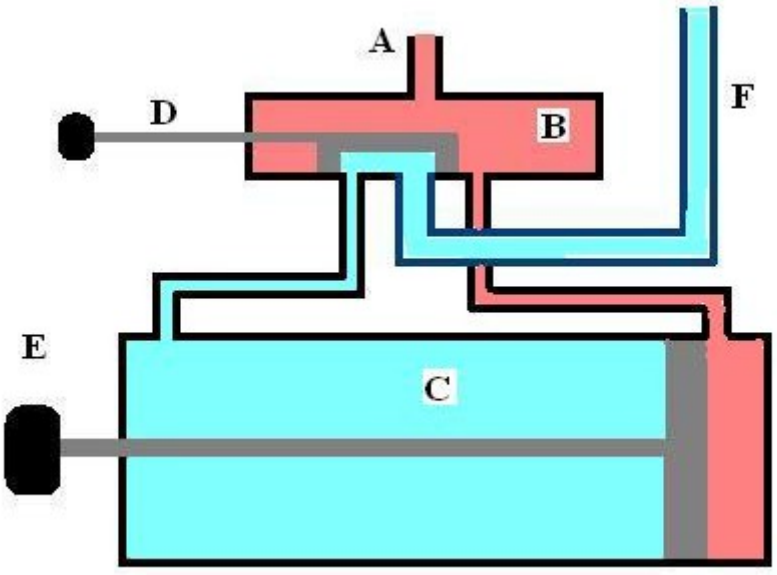


Figure 5

The left movement of the valve D, allow for steam pressure to get on the right side of the piston, and this movement will force the piston to get back to the left as in fig. 6.

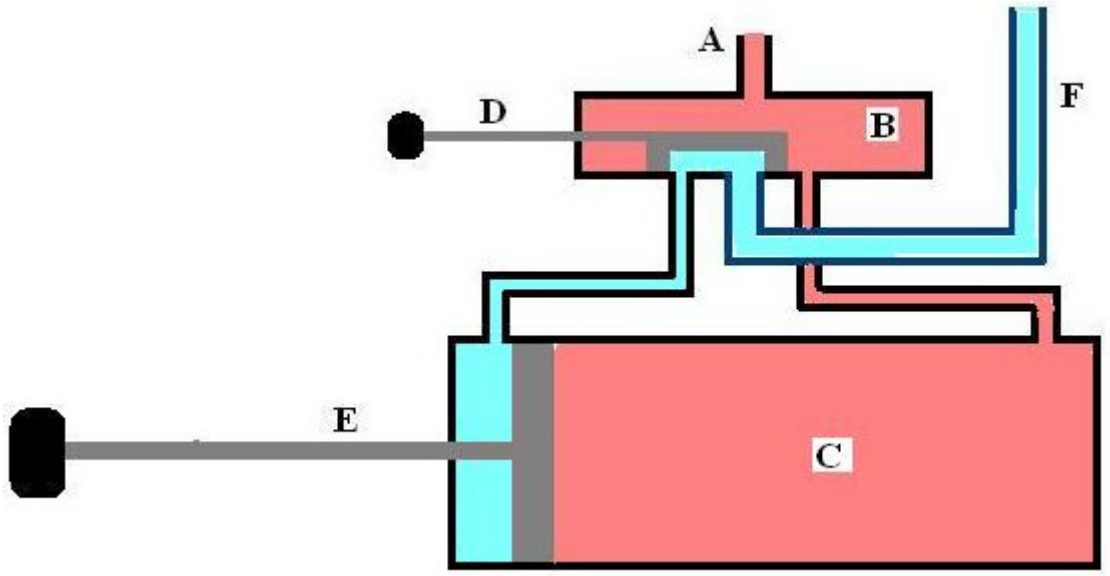


Figure 6

D valve changes position again and basically the situation in fig. 7 is almost identical to the original situation. The difference is that we have the right of the piston chamber filled with steam and this is now in contact with the atmosphere. As in the previous case, there is a natural tendency to balance the pressures between the piston chamber and the atmosphere, with removal of excess steam in atmosphere.

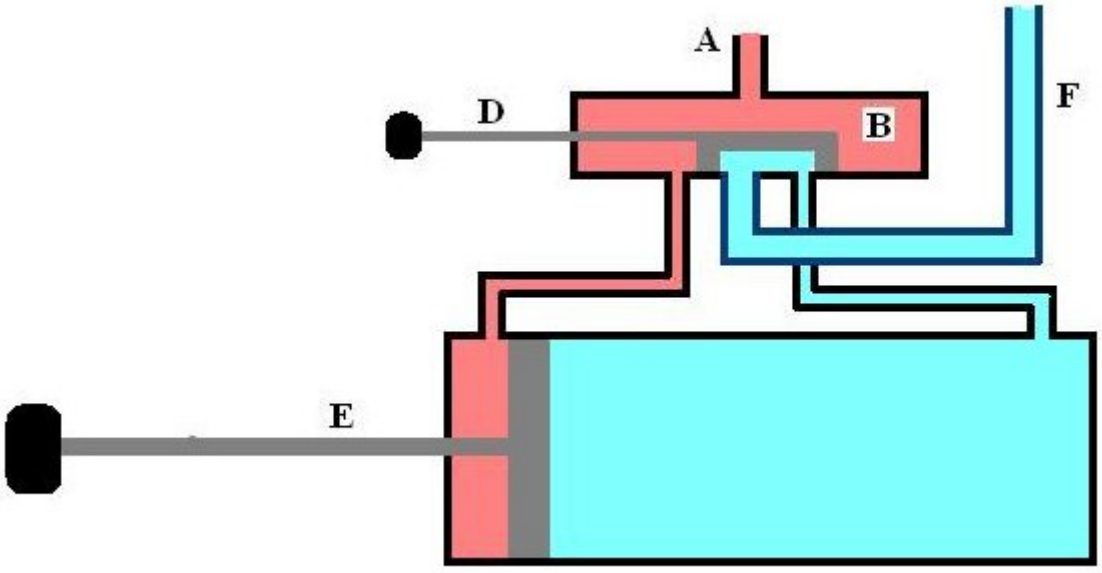


Figure 7

In this way the steam is admitted alternately to each end of the piston and the other end is automatically connected to the outlet channel and this come-and-go motion can then be converted into circular motion using a rod.

After a period of glory of more than a century, steam engines were generally abandoned in favor of internal combustion engines.

Experimental part

Consider a steam engine (one recovered from a toy can be used too but the pressure of gas must be changed), but instead of steam produced by the boiler, a pressurized gas cylinder is connected to the inlet A (fig. 8). Gas tank temperature is in equilibrium with the environment. It is completely irrelevant whether the experiment is performed at the Arctic Circle where we have an ambient temperature of -30 °C, or at the equator where the ambient temperature is +30 °C. For economic reasons we use a nitrogen tank which is provided with a pressure of at least 15 to 20 atm, but any other gas used will give the results.

Nitrogen under pressure coming from the tank enters the intake path that is left free in the left chamber of the piston (fig. 8) and as far the piston has the possibility to move, the gas pressure will force the piston to go to the right as in fig. 9.

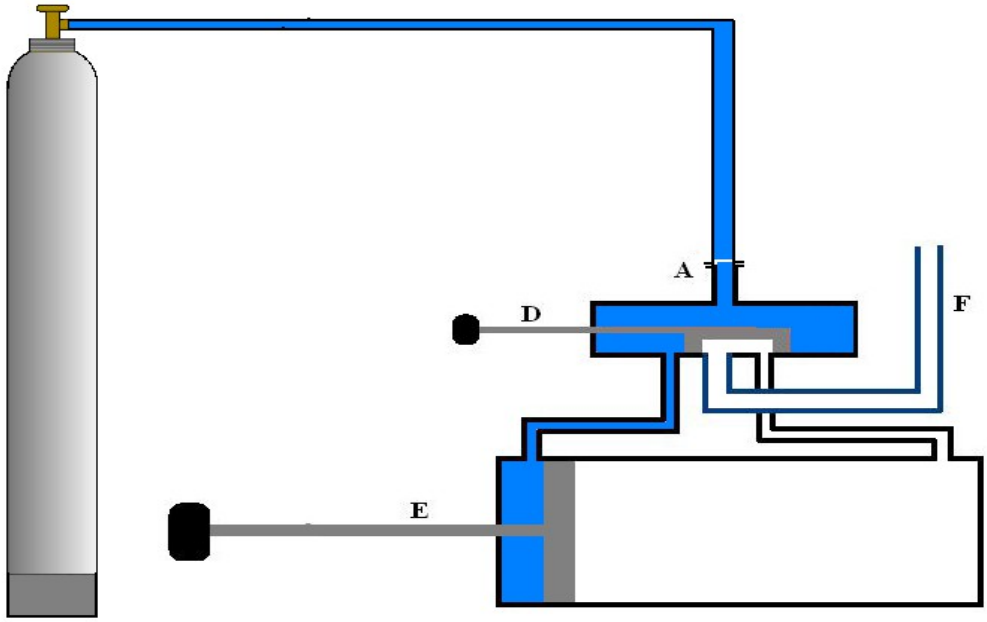


Figure 8

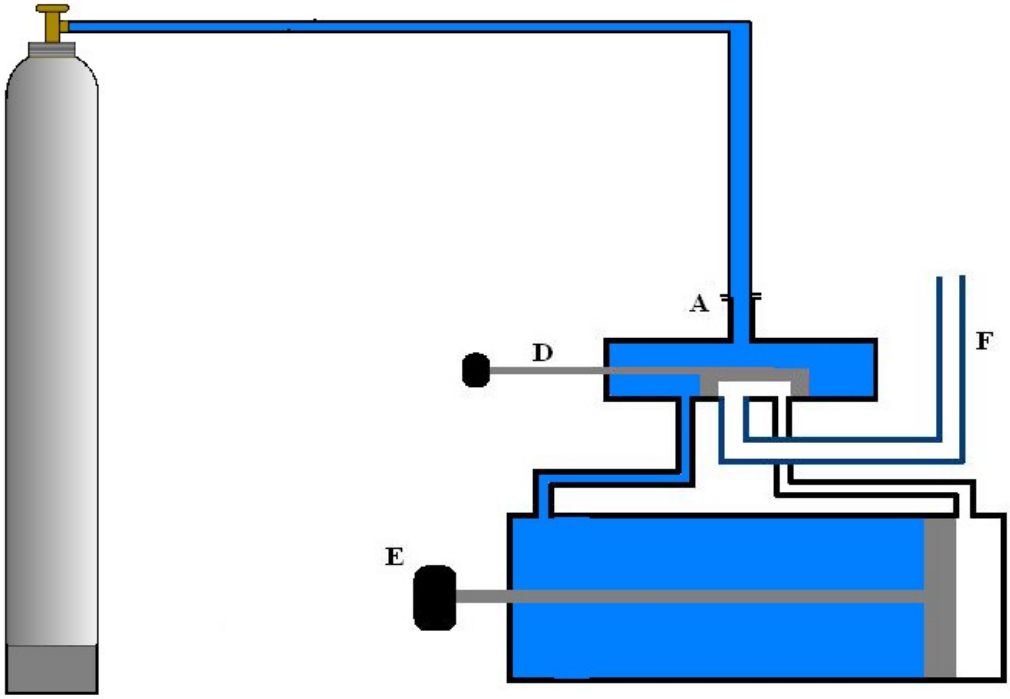


Figure 9

As the piston reaches maximum path toward right, the valve D moves to the left, block the entrance to the left room of the piston and now gas under pressure is entering the right chamber of the piston as shown in fig. 10.

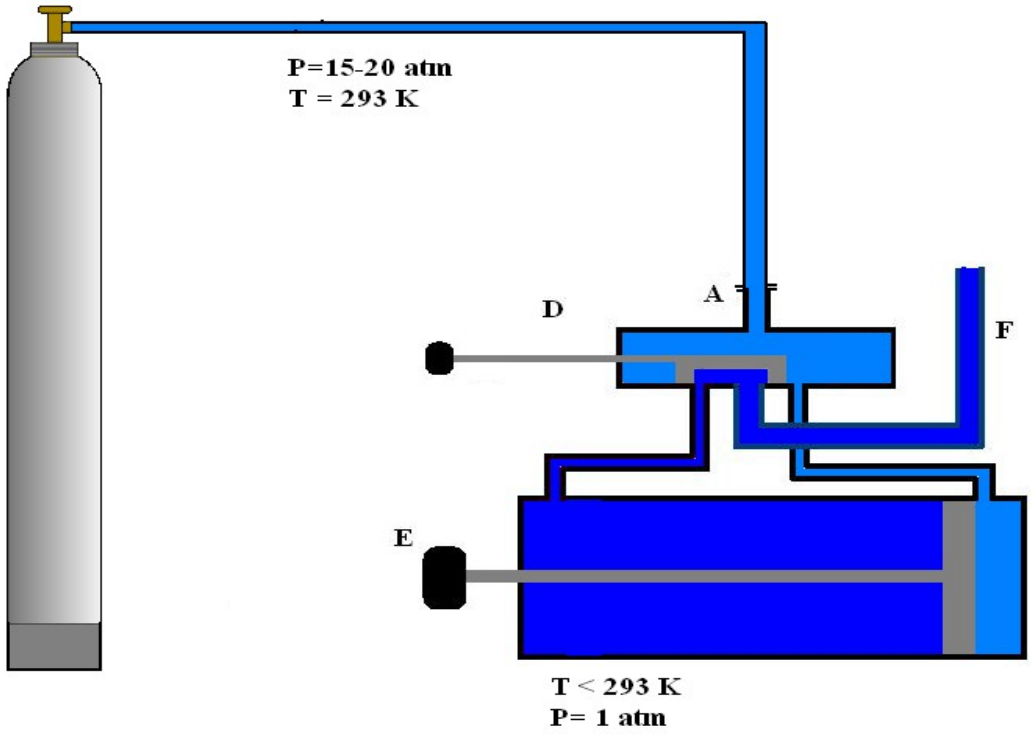


Figure 10

In the same time, the left of the piston chamber can communicate with the atmosphere through the exhaust pipe. In this way there is a pressure balance with the removal of excess gas pressure in the left chamber of the piston.

The gas under pressure entering the right chamber of the engine, forces the piston to move back to the left as shown in fig. 11.

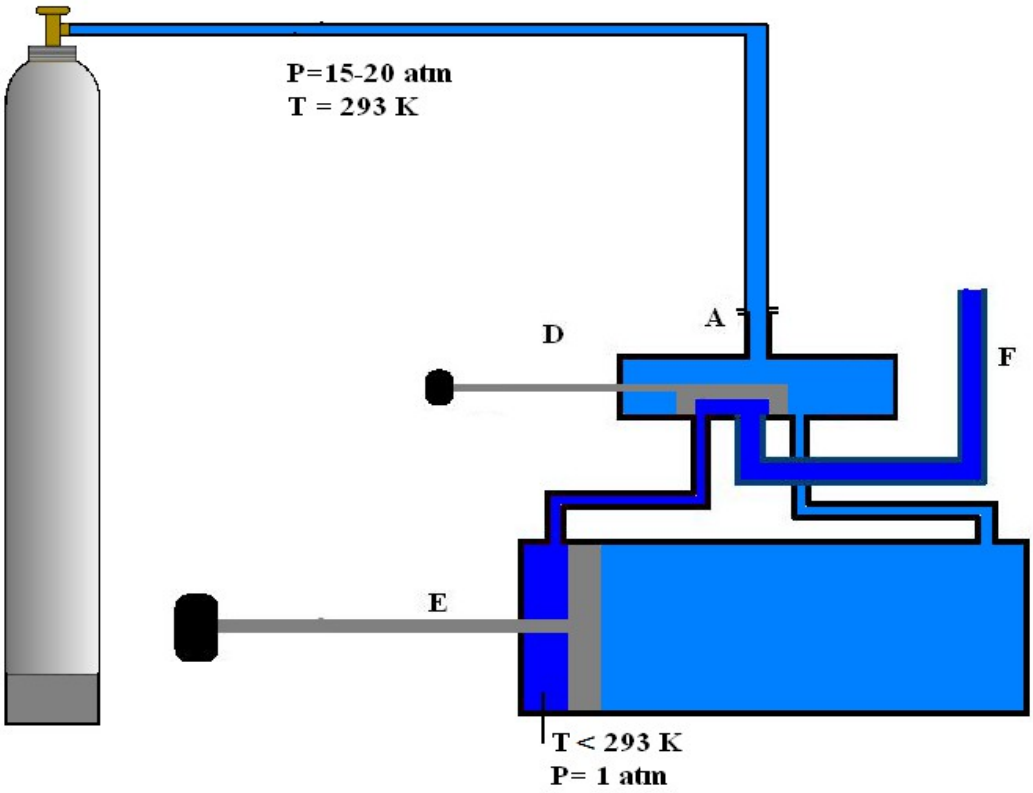


Figure 11

The valve D move to the right and the cycle can start again -fig. 16.

As it can be seen, there is no difference in the operation of a steam engine when this is supplied with a gas under pressure at normal temperature or with a high temperature steam. If some structural adjustments are made, it can be obtained a higher yield in case of a pressured gas at normal temperature than a steam at high temperature. Although the experiment is rudimentary and common, its consequences over current thermodynamic concepts are dramatic. The entire thermodynamics is ruled out by this simple experiment.

There is a new idea which can explain the functioning of any these devices better: engines are working based on pressure gradient and not on temperature gradient.

The formulation given by Planck for the second principle II: it is impossible to obtain mechanical work through a cyclical monothermal process is a nonsense. Without the need for two thermal sources an engine can work for an indefinite time and deliver enough mechanical work.

This does not mean that expansion and compression of gases in the engine are taking place without a heating or cooling effect.

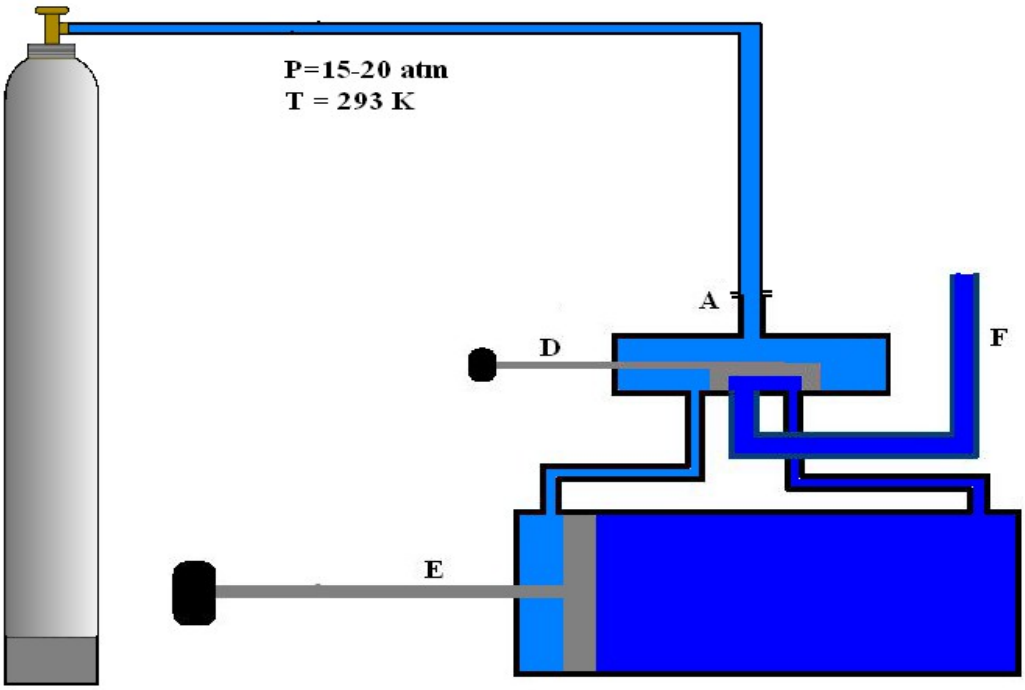


Figure 11

In the proposed theory, the so called steam and combustion engines are working based on pressure gradient generated into engine. The secondary temperature gradient can in a indirect way increase the pressure gradient into engine.

It is important to be highlighted that compressed air cannot be used as fuel for the early steam engines which are in fact condensation engines. It is obvious that air cannot be condensed in the same conditions as steam.

SECTION II EARLY ATMOSPHERIC STEAM ENGINES

The early history of steam engines could be compared with UFO history. There are a lot of data, but no one have made head or tails about these topics. As example, after reading a lot of information about Savery machinery, having also a background in physics and chemistry, having also good skills for mechanical or electronic devices, it was still difficult for me to grasp the simple principle of its functioning. The fact than one can find in internet only artistic representations for this device increases the ambiguity about these devices too.

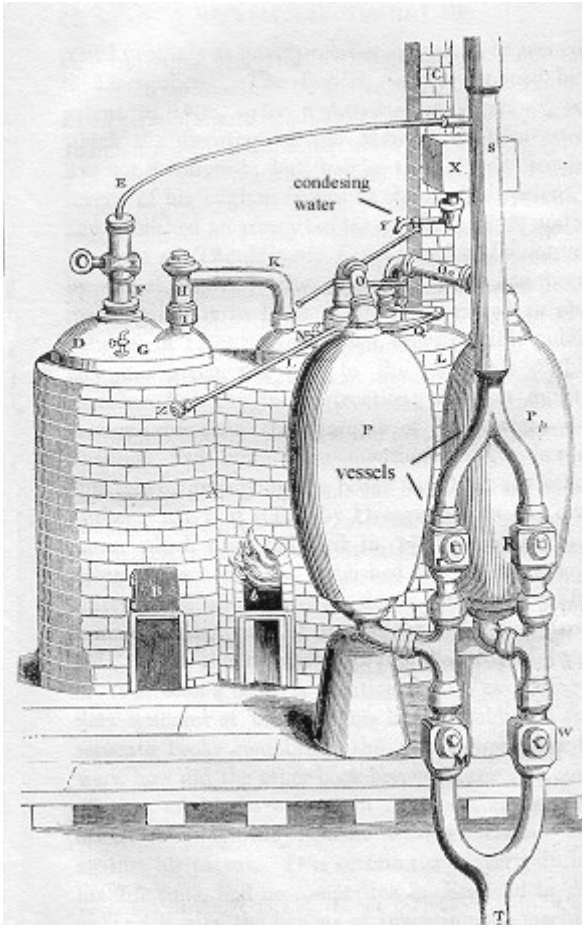


Figure 12 Artistic reproduction of Savery machinery

Of course, a lot of people have been interested to keep the situation fluffy in order to not uncover some disturbing truths.

It is high time to present this information in a simple and clear manner so even a laymen can grasp the absurdity of this entire situation.

For the future, it is going to be necessary to have a more detailed description of the history of hydraulic and steam devices, but being hectic with time, this analysis starts with the year 1690, when Denis Papin advances for the first time the idea of a piston driven steam engine.

As already presented in a previous newsletter, his device and experiment is the father of all later developed steam engines working with positive or negative gradient of pressure so any discussion has to start with it.

The Papin engine was a metal tube, closed at one end, and having a piston inside – fig.13. Under the piston there was a small quantity of water which, when warmed up and transformed in steam, raised the piston who reached the edge of the cylinder where was stopped by a click. In the second step, a stream of cold water was sprayed onto the cylinder. The cylinder cooled and the steam inside condensed. This produced a partial vacuum and the outside air pressure forced the piston down (active stroke). The tube had three roles: boiler, cylinder and steam condenser.

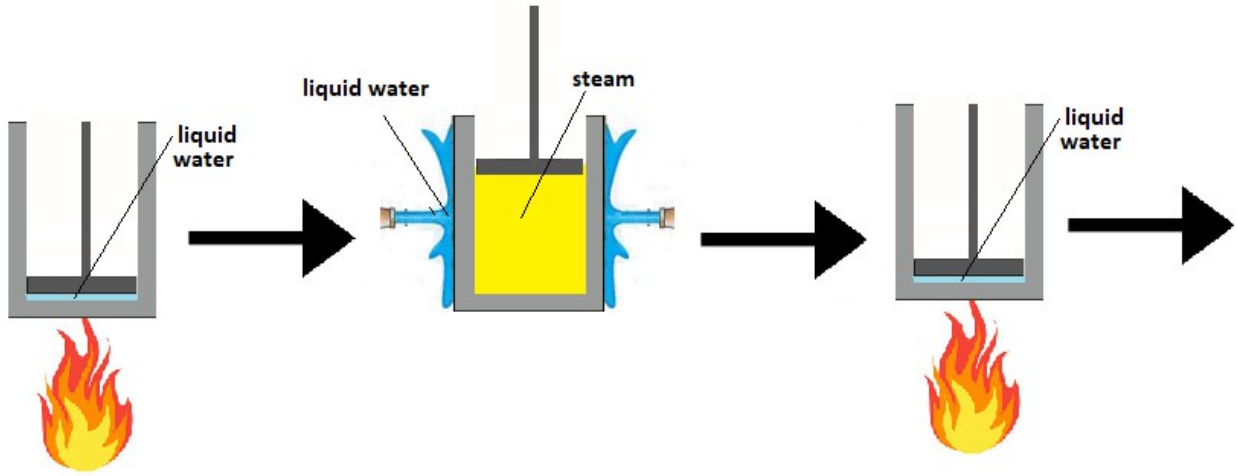


Figure 13 The functioning of the first piston steam engine

It is better to underline from the beginning of this section another exemplification which shows again that a gradient of pressure is the main driver of the mechanical work produced by such an early engine and not the heat of the process:

https://www.youtube.com/watch?v=Caqf4hQBYBI

How Does a Steam Engines Work? | Earth Lab

The experiment was performed under BBC Earth Lab supervision. The science behind the first steam engines largely consisted of creating a vacuum inside a vessel by adding cold water to steam. I was stunned by the explanation provided by the presenter in the video, which I suppose is a „scientist" with a Ph. D. in physics. According to him „***by using steam the wrong way turned out to be the right way".***

Welcome to BBC and welcome to modern science! Isn't curious that for about a century, mechanical work was produced, by using steam ***„the wrong way"***?

The Savery machinery, patented in 1698, in essence, uses the same physical principle formulated by Papin, but with a change of background. Don't get me wrong, I am not implying that Savery machinery is a version of Papin engine. From the perspective of intellectual property, ***Savery machinery is a suction pump for liquids, and Papin device is an engine.***

The fact that British parliament offered a patent to Savery for an engine, was in fact a way of controlling the market and this was analysed in a previous newsletter; for the future this event has to be reminded as a case of intellectual and commercial fraud and not as an ,,intellectual performance".

It is obvious that such harsh conclusions have to be supported by a clear analysis of what each of this device really do....

Let us start debunking the Savery machinery for a laymen understanding....

As far Savery got the patent only by presenting the title of his invention, it is obvious that scarce information exists about this machinery. Yet, after serious digging in internet, I was able to find some supplementary details about the working principle of this machinery – fig. 14.

The same artistic representation of Savery machinery is provided even in this case but at least it explain the working principle in a few words; it is highly improbable that the technology available at that moment would have permitted such perfect ovoid vessels to be obtained.

In the right part of fig. 14 one can see how this device has to be positioned relative to the underground water and to a river or a drainage water system; this is a very important remark, because the functioning of this machinery is conditioned by this factor. As far the machinery had to be installed underground, it was mandatory to have also a system for smoke evacuation.

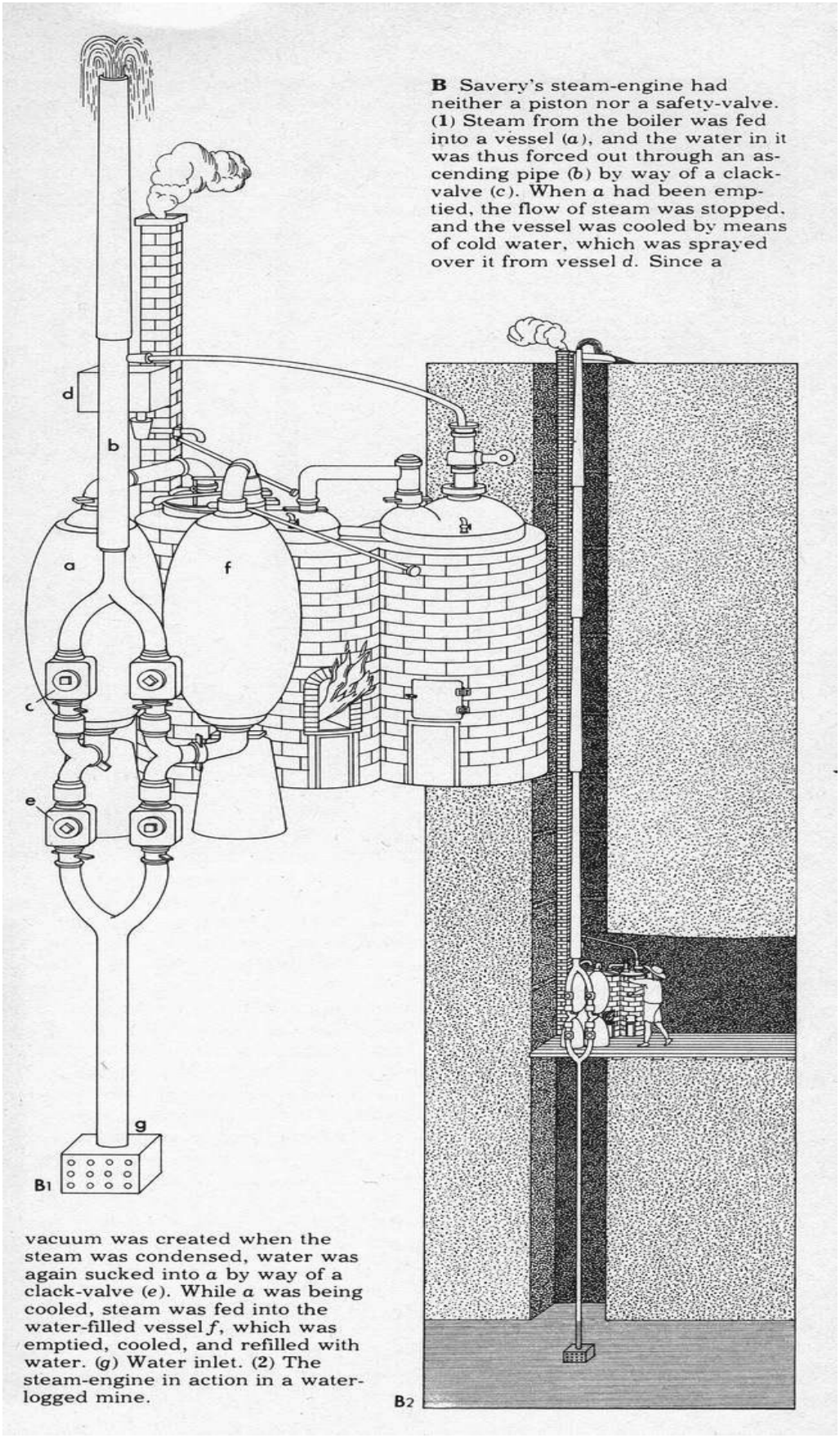


Figure 14 Savery machinery with details - internet source

The machinery had to be composed of one boiler, an intermediate tank for water-steam, pipes and some valves - fig. 15. I suppose that non return valves were not available at that time, but I found it simpler to update the schematic with this utility.

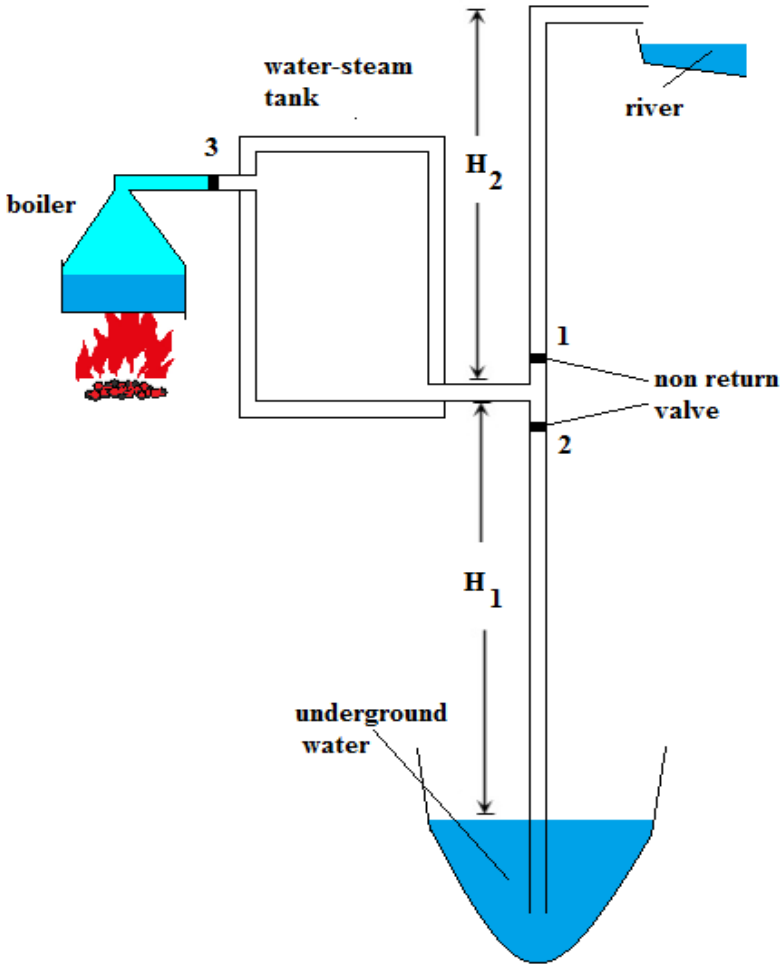


Figure 15 Reconstructing a Savery machinery

The boiler is a source of steam, which is further used for doing a sequential work in this machinery.

Once there is a steadily amount of steam available, the valve 3 is opened and steam is filling in the tank. The air from the tank is purged out by the steam and of course also some steam is released into atmosphere through valve 1 – fig. 16.

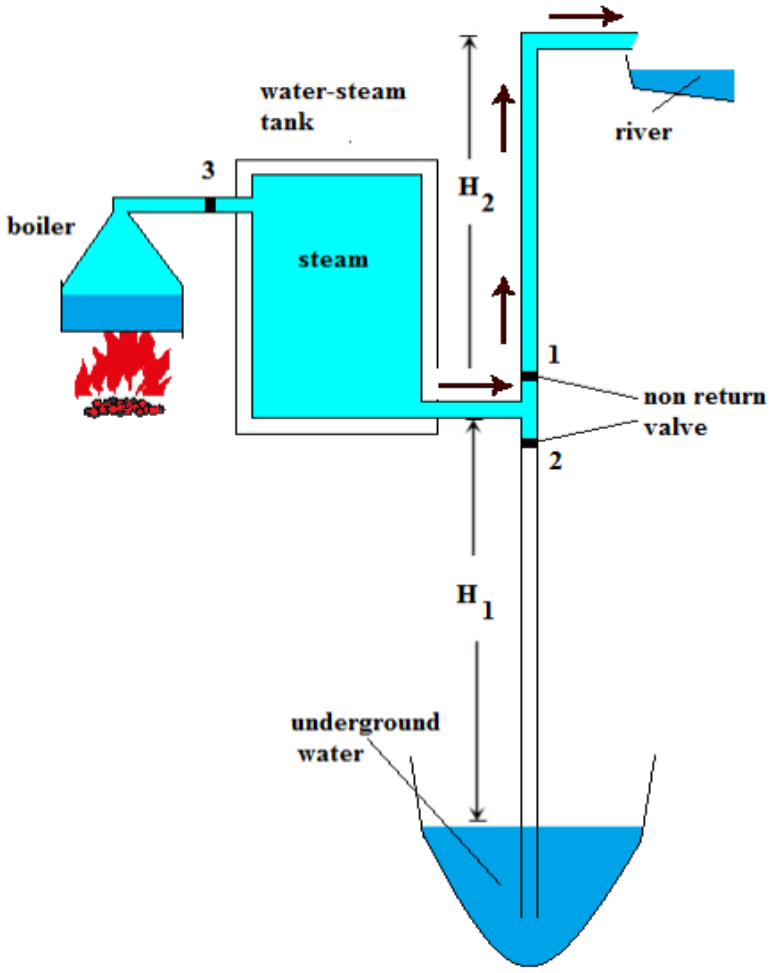


Figure 16

Then, the valve 3 is closed and the tank is cooled from outside with cold water, so the steam inside condense in liquid – fig.17. This main step uses the same principle as described by Papin, but with a different configuration, i.e. no mobile piston.

As result of this steam condensation, the pressure inside tank decreases under the level of atmospheric pressure ($P_{tank} < P_{atm}$).

The air cannot return to the tank to compensate this decrease of pressure because the valve 1 is working only one way. At that time, the valves were commuted by hand by an operator.

In order to compensate the decrease in pressure inside tank, the underground water start to rise in the pipe and through the valve 2, enters into the tank – fig. 17.

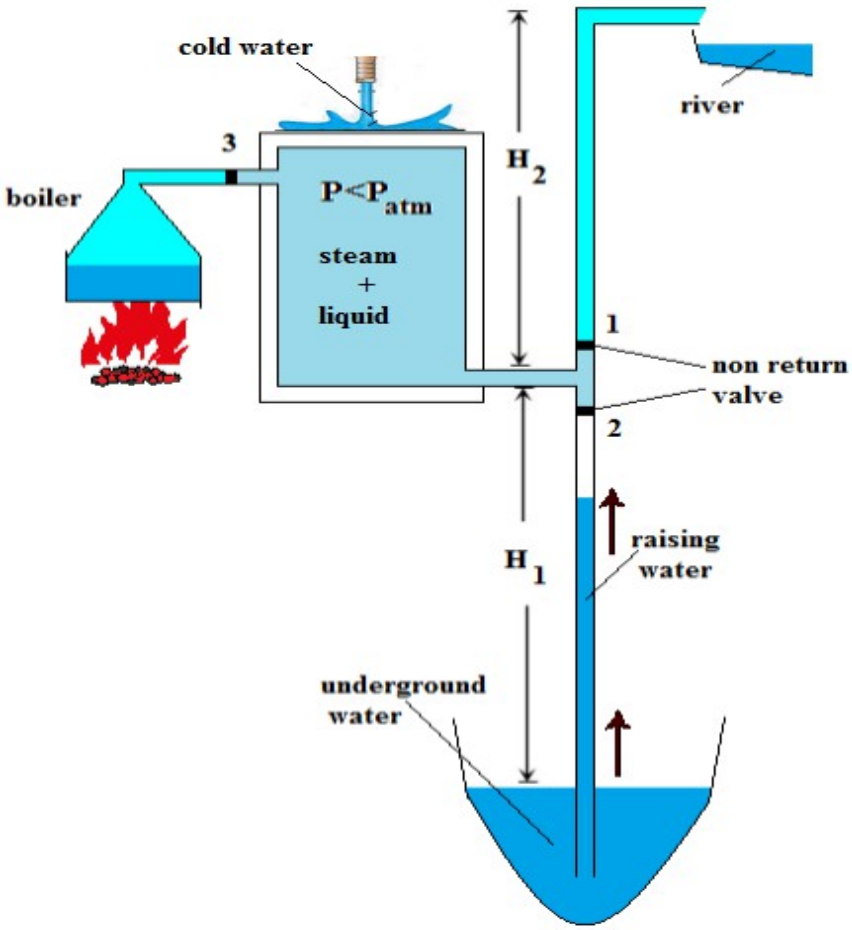


Figure 17

The water from underground continues to have a forced motion toward the tank based on the gradient of pressure ($P_{tank} - P_{atm}$) existent between the tank interior and the atmospheric pressure – fig. 18.

When the gradient of pressure ($P_{tank} - P_{atm}$) decreases under a certain value, the flow of water into the tank stops.

The water from the tank is trapped there and it cannot return back under the gravitational effect, because the valve 2 works only one way and stops this action.

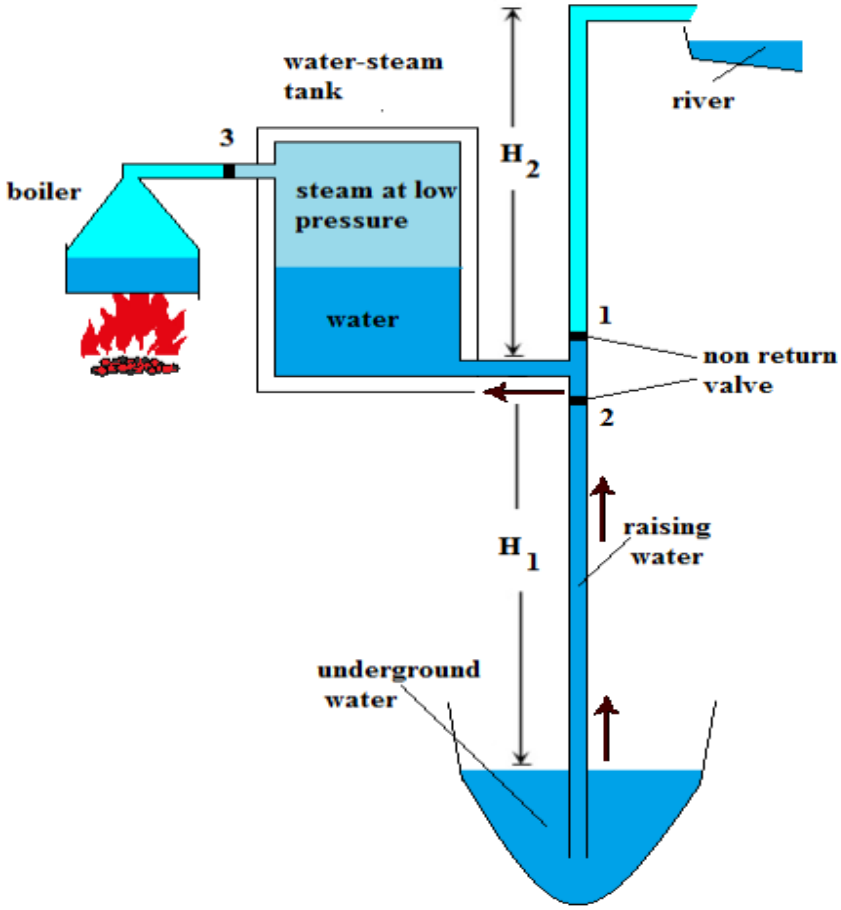


Figure 18

Now, the valve 3 is opened again and steam enters again the tank – fig. 19.

Unfortunately there is also liquid water in the tank and it is obvious that two different effects take place here.

- A part of the incoming steam condense in contact with cold water in the tank.
- Steam is going to increase the pressure in the tank and purge out the water from the tank through the valve 1 toward outside.

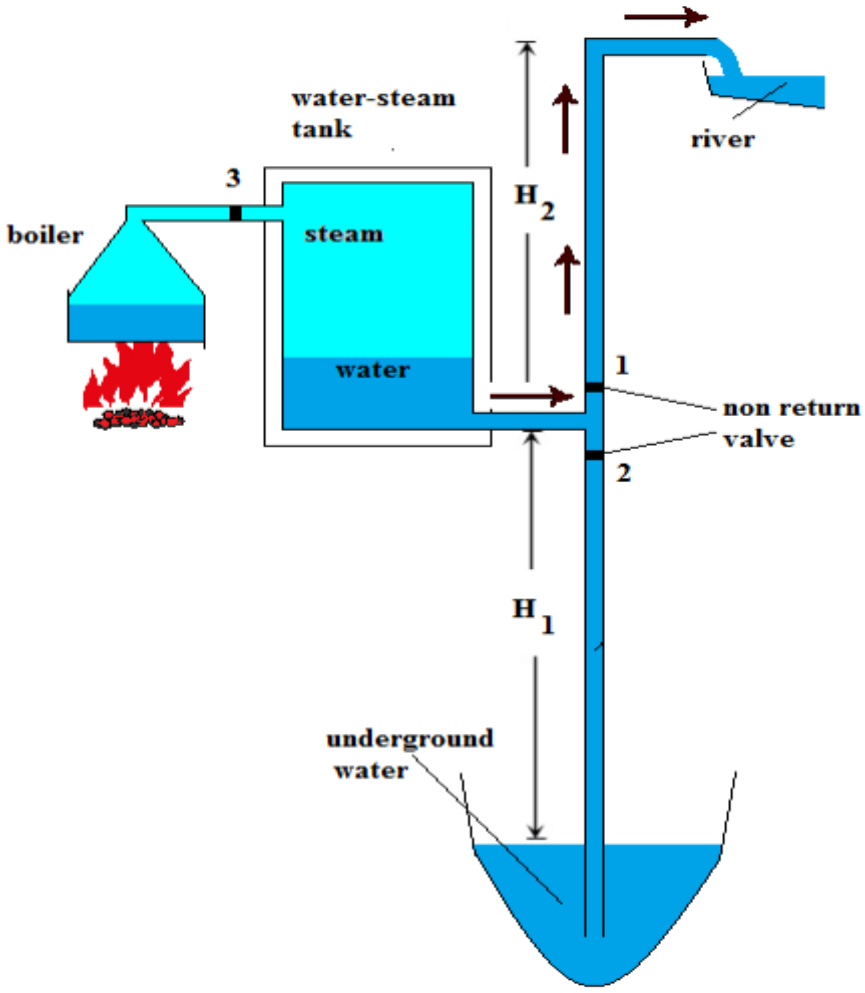


Figure 19

If the incoming steam has enough pressure, it will push all the water from the tank outside similar to the air purging previously - fig. 20.

The cycle repeats again following the same steps....

It is obvious now even for a laymen that such a machinery cannot ever be used to produce direct mechanical work.

Does someone see any piston or any other possibility to obtain direct mechanical work from such device?

Yet, for centuries, this machinery was considered as the first steam engine....

I suppose there have been other similar devices prior to the real steam engine, and if those device are not reminded as important for the science, neither the Savery pomp should be!

Further on, the performances of this type of pump are limited by the working principle used.

Even a child, learning about fluids, would be able to understand why Savery machinery was a complete failure in practice.

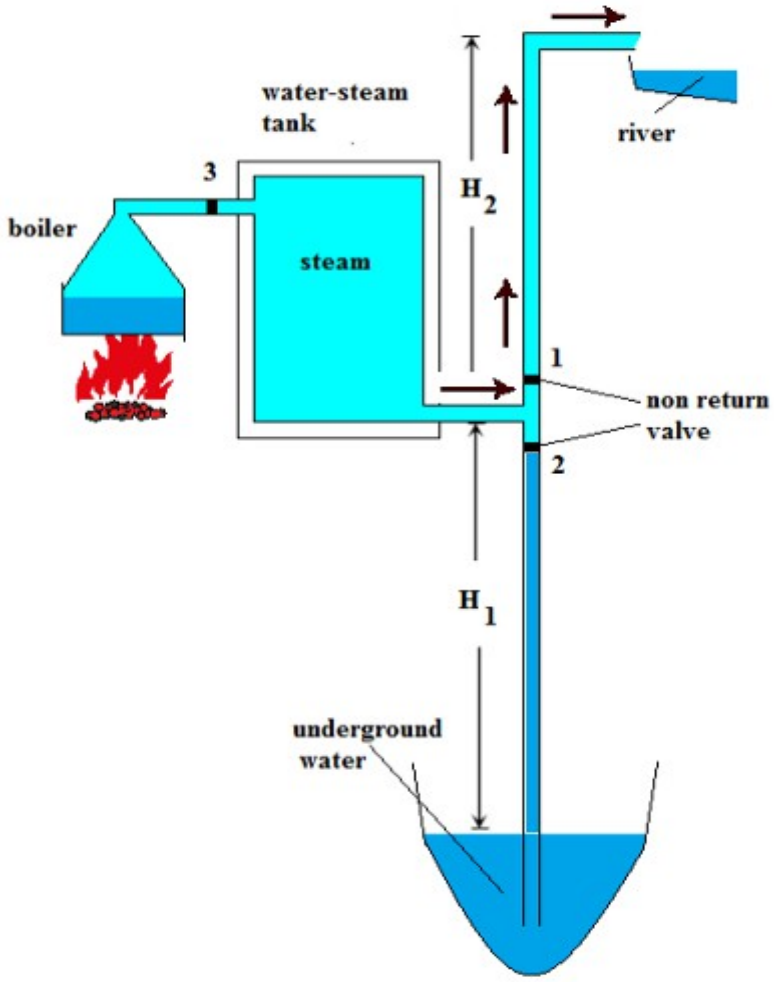


Figure 20

In case of a suction process having a tube longer than about 10 m height, the gradient of pressure was not enough to bring the water in the tank. As consequence H_1 have to be less than 10 m.

It is obvious that the entire machinery had to be assembled and put to work underground near the water source.

Have you ever imagined such machinery burning inside a mine tunnel, where already the air was scarce and the ventilation non existent?

The second limiting factor is the length of the evacuation tube. The steam pressure of the boiler was not high enough to push the liquid from the tank if the vertical column of evacuation was too long. I do not have some clear data, but form the information found on internet, the height of evacuation column had to be maximum 20 m. By forcing to have a greater pressure for steam, the boiler usually exploded, because the technology of high pressure containers was not developed yet.

Some information from internet assumes that the record of Savery pump was about 25 m.

It is obvious that with such „record" there was little or no interest to use such machinery or a succession of such machineries in practice. If the underground water was 100 m deep, a succession of at least four pumps was necessary, and the entire cost of this process was increasing quite exponentially.

On the other hand, even by using a single pump, the entire succession of thermodynamic processes was highly inefficient and the cost of water pumping was unjustified high. Assuming as modern thermodynamics preaches that heat is transformed into mechanical work (in this case the heat consumed has to be proportional with the water pumped), the general yield of this machinery had to be less than 0,5%.

In conclusion this pump has been used only for decorative purposes or occasionally by some aristocrats for their water supply only.

Now, it is high time to leave this pump aside and return to some real steam engines.....

This section is going to further demonstrate in a simple but elegant manner how and entire class of steam engines, the so called **atmospheric steam engines**, are ruling out again the entire imbecility of second law of thermodynamics and of course the rest of modern thermodynamics.

For close to a century, the so called atmospheric steam engines were the only available type of steam engines used in producing mechanical work.

There are some major improvements to the original piston steam engine conceived by Papin, which increased dramatically the performance of this engine.

The first improvements regards the separation of boiler from engine and the internal condensation of steam – fig. 21. These invention have been fraudulently attributed to Thomas Newcomen. As described in a previous newsletter (the process of information faking part I), Denis Papin was killed and his documents stolen in order to have the plans for his latest steam engine. It is going to be a further detective work to uncover (if possible!) how Thomas Newcomen got the plans for this advanced steam engine and the implication of Newton and his acolytes in these events.

Instead of having an external cooling for the cylinder, in the advanced version of Papin engine, i.e. the middle model, cooled water is sprayed inside cylinder and this was a significant technological step; the separation of boiler from engine was also important because it allowed a very precise control of the timing for steam entering into the cylinder. This improvements can be schematically observed in fig. 21, by comparing left and the middle models of a steam engine.

Other relevant invention was made much later by James Watt, who separate the condensation of steam from the cylinder engine; this is observed again in fig. 21 by comparing the middle model and the right model.

Of course the engine was steadily improved over years and there are decades of inventions which made it better, but these are the main inventions related to the „working principle".

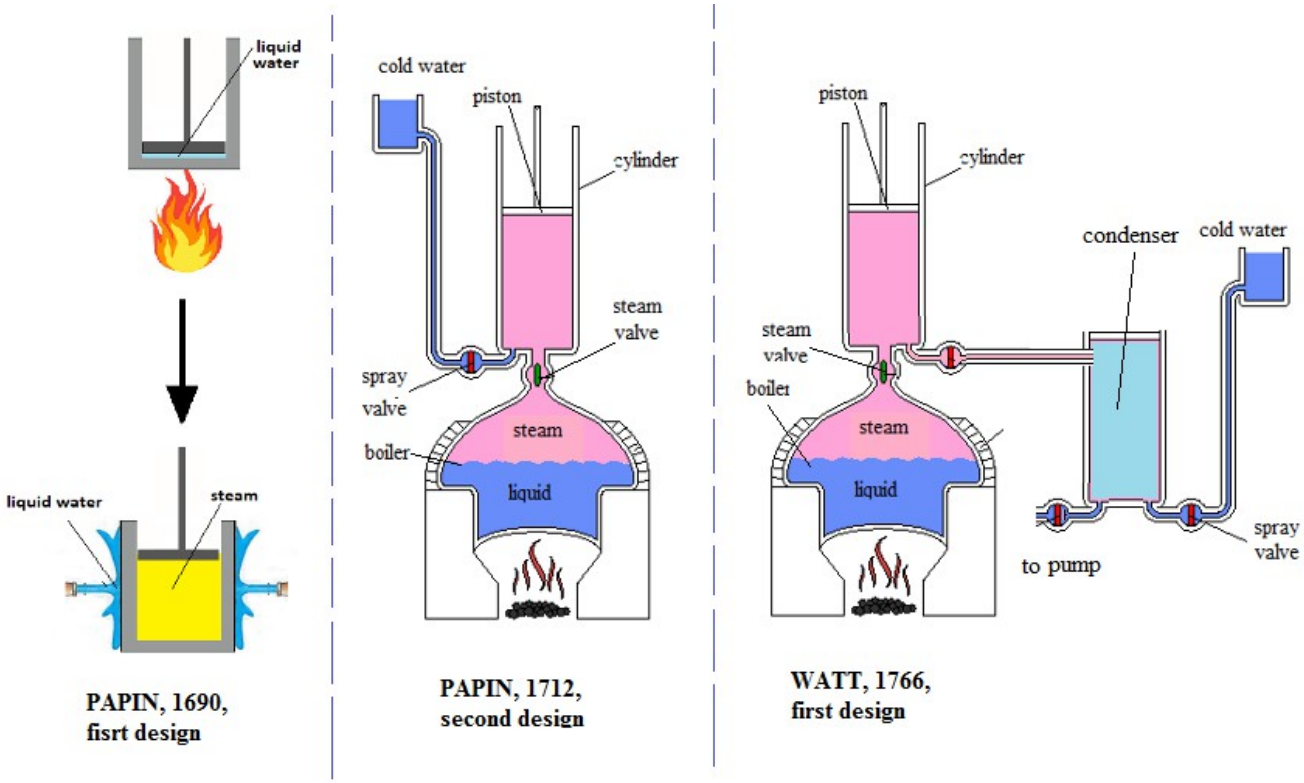


Figure 21 Principal improvements to atmospheric steam engine over years

For the moment, I do not have the time and the support to analyze the scientific activity of the real genius of thermodynamic, i.e. Denis Papin; there is no hurry though ….

Leaving apart other technical or priority details, which are irrelevant for the present discussion, one can understand that the improvements to this engine could not be made by someone without know-how and a lot of mechanical skills.

If one analyses the middle and the right model from fig. 21, the difference seems to be only a new vessel and a few pipes. The main configuration is quite the same and in fact, in practice, Watt only adapted the existent working engines to the new configuration. Yet, from scientific point of view in order to have these improvements, James Watt, who was already a mechanical engineer and keen of mechanical devices, needed about a decade of experiments. From economic point of view the right model was about four times more efficient as the middle one.

How could someone imagine that the technological jump from the first model to the second one was made by an unskilled person, at once, and without any kind of experiments?

As I underlined previously, assuming that someone was indeed able of such performance, Thomas Newcomen should be celebrated as the greatest genius of humanity ever! From the

perspective of new theory, he is only a impostor and by sure a collateral beneficiary of Newton arrangements.

Any theory of thermodynamic should have modelled from theoretical point of view how these „primitive" engines have been working and the amount of mechanical work produced by them.

Newton, assumed to be the greatest mind of humanity, although saw some of these engines performing mechanical work, was not interested at all to advance an idea about their yield. Well, he had an excuse though: he was busy sabotaging the real inventor of steam engine and planning his assassination....

If one browses the entire literature in physics along time, up to these days, i.e. tons of junk papers, there is no mention about the yield of such atmospheric steam engines ever....

If a simple laymen analysis these engines based on Carnot formula, then, the results are completely incomprehensible and in fact are against the observational facts.

All these models from fig. 21, according to Carnot formula, should have performed with the same yield.

Even a pupil know that Carnot formula assumes the the yield of a thermal engine depends on the highest temperature and the lowest temperature of the working agent which is supposed to perform an thermodynamic cycle and this can be expressed in formula:

$$\eta = 1 - \frac{T_{lowest}}{T_{highest}}$$

All three models in the fig. 21, have been working between the same lowest and highest temperature; for simplicity let us assume that lowest temperature was 20 C and highest temperature 100 C.

The yield for each model presented in fig. 21 should have been :

$$\eta = 1 - \frac{293,13}{373,15} = 21,4\%$$

In practice, it is well known that the middle model was performing with a maximum 1% efficiency and the right model was performing with about 3-4% efficiency; one has to assume that left model was performing with 0,1 % efficiency.

These data were available when Carnot wrote his essay about the yield of a thermal engines, in the frame of caloric theory. As a reminder, the caloric theory assumed that heat consists of a self-repellent fluid called caloric that flows from hotter bodies to colder bodies. Illustrious and less illustrious theoreticians later considered that caloric theory of heat was wrong, but the Carnot formula is still correct.

It is difficult to say and I could not find any clear references about the experimental data these theoreticians and even Carnot have considered in assuming that such formula is correct. Maybe in the future I am going to find such information and make a thorough analysis.

From the perspective of the new theory, the experimental data already existent before 1824, when Carnot published his essay, were in flagrant contradiction with his formula.

These data have been available ever since, but no one was interested or did not observe that in fact these data rule out again the modern thermodynamic.

As far these type of engine can be refurbished to produce mechanical work based on a more hybrid technology (see section 3), it is important to have a clear understanding about their working principle; the theory about their yield can wait a bit until some funds are secured ….

The original model consisted of a steam piston/cylinder that moves a large wooden beam to drive the water pump as in fig. 22.

It is important to be highlighted that such engine does not use steam pressure to push up the steam piston!

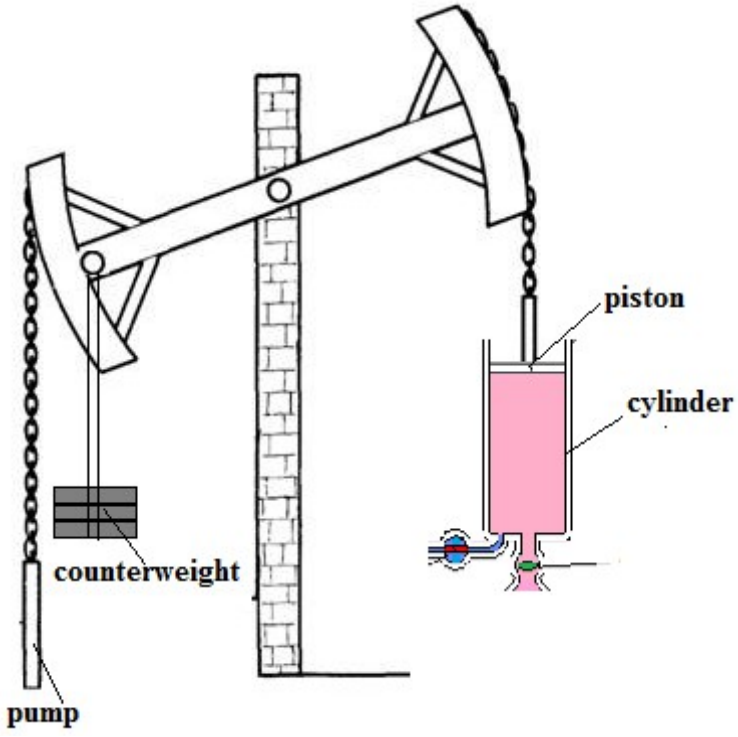


Fig. 22 Equilibrium position of piston in case of atmospheric steam engine

Rather, the system is constructed so that the beam is heavier on the main pump side, and gravity pulls down the main pump side of the beam. Usually, the pump weight was enough to achieve such purpose, but sometimes counterweights were added to the main pump side if necessary.

Let us consider a cycle that starts with the beam tipped down on the right, i.e., the piston is down in the cylinder, near the steam admission valve as in fig. 23.

In absence of steam coming from boiler, the piston does not move up, although the weight of the pump or other additional weight would favour this motion; in order for the piston to move up in these conditions, a mechanical work against the atmospheric pressure has to be done and the counterbalance weight is not enough for this action.

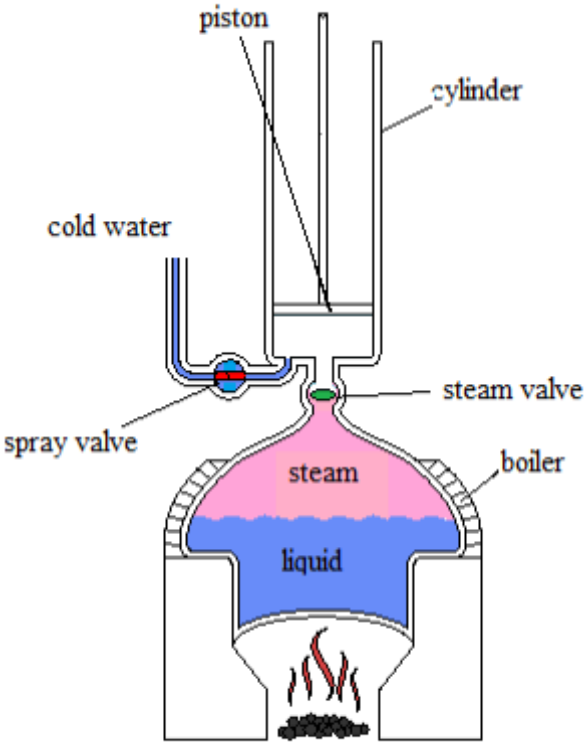


Figure 23

When the steam enters the cylinder, as result of steam valve opening, the pressure inside cylinder although remain close to the atmospheric pressure, allow the movement of the piston toward the up position. The steam coming from boiler allow the pressure to remain equal with atmospherics pressure although the volume of the piston-cylinder system increases. In this conditions the counterweight can perform a mechanical work and the piston moves toward the up position – fig. 24.

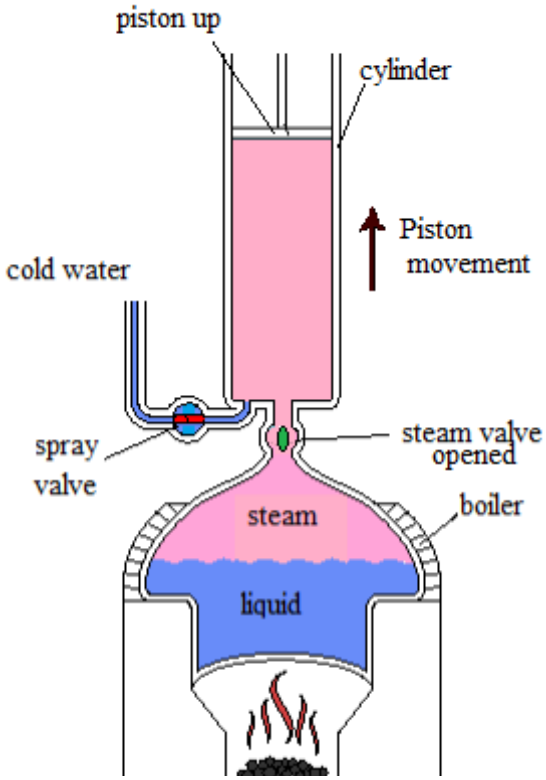


Figure 24

When the entire cylinder is filled with atmospheric pressure steam, the steam valve is closed and cool water is sprayed into the cylinder to condense the steam as in fig. 25.

By condensing water from steam to liquid, there is a dramatic decrease of volume and consequently the pressure inside cylinder decreases under the atmospheric pressure. As far both valves for steam and for cold water are closed, the formation of a partial vacuum inside cylinder pushes the piston down and this action performs mechanical work by moving the connected water pump.

When the pistons arrives in its lowest position, the steam valve opens again and a new cycle of operation is possible ….

It is important to be highlighted again that power stroke of this engine is performed by the "weight" of the atmosphere which exerts a net force on the piston when a partial vacuum was formed in the cylinder.

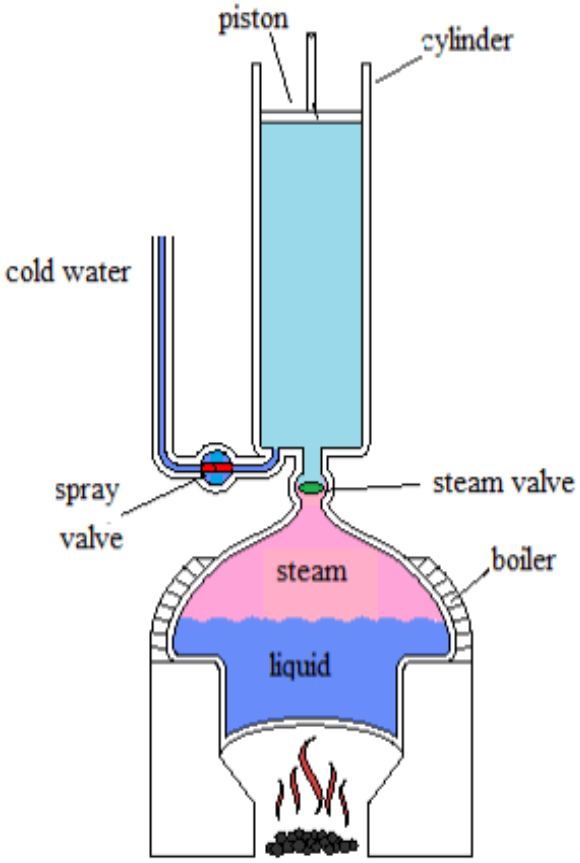


Figure 25.

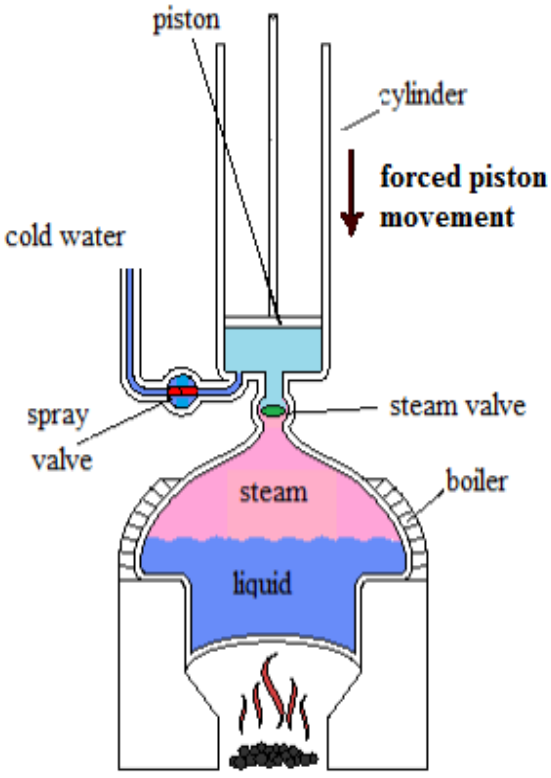


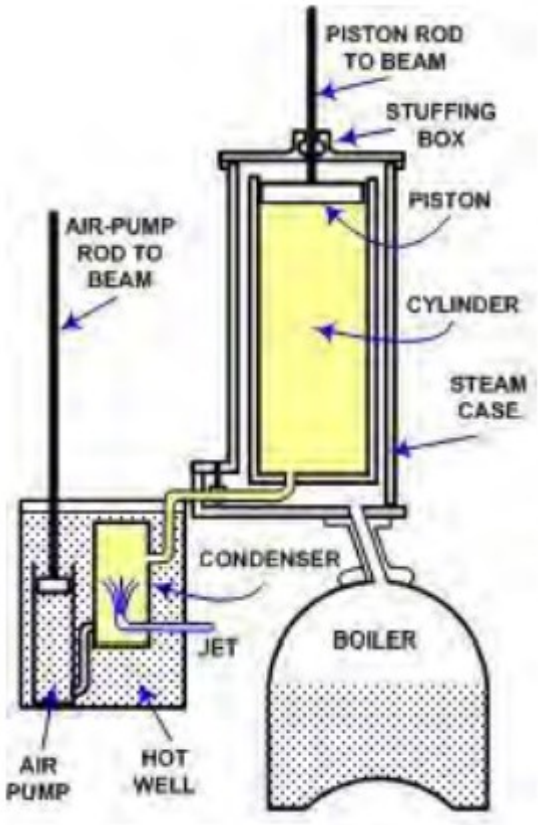
Figure 26.

It would be oversimplified to think that James Watt improved only the condensation step in a steam engine. He analysed thoroughly any component of the Papin`s engine and brought improvements to them.

In an more advanced version of such engine, the steam piston/cylinder are notably more complicated than Papin`s model. In order to keep the cylinder hot, the entire engine is surrounded by steam. The engine has a "jacket" of steam around it.

In order to improve the condensation a pump was used to suck the steam and have a forced condensation. The same pump was also removing the condensate from the system. .

Figure. 27 illustrates such an apparatus.



Figere 27 Advanced version of earlier Watt atmospheric steam engine (from internet)

The principle of operation for a Watt engine, is very similar to a previous Papin`s engine.

Watt correctly identified that most of the steam used by Papin`s engine was wasted because the cylinder had to perform a succession of antagonist operations. When the cool water was sprayed, this was cooling the walls of the cylinder too. In the following phase of steam admission, a lot of steam was necessary to heat the cylinder again in order to start a new cycle...

Instead of making the condensation into cylinder, this step has been performed in condenser, which becomes available by opening a valve. After the condensation step takes place, the valve is closed and the same succession of steps, as previously, are performed.

As the power cylinder remained at operational temperature all the time, the system was ready for another stroke as soon as the piston was pulled back to the top.

Watt never ceased improving his designs. This further improved the operating cycle speed, introduced governors, automatic valves, double-acting pistons, a variety of rotary power take offs and other improvements.

I***t was obvious, even for those times, that efficiency of such engines was limited by the low pressure, by the combustion and evaporation rates and by condenser efficiency.***

As the 18th century advanced, the technology advanced too, so it was possible to have components which resisted at higher pressures. Unfortunately, James Watt was against the idea of building a steam engine at high pressure and he used the monopoly his patent gave him to prevent others from building high-pressure engines and use them in other applications like transportation.

Later, after his patent expired, he couldn't do anything and the high pressure steam engine, which has net advantages for some applications, flourished and of course replaced the atmospheric steam engine.

The topic of high-pressure steam engine is going to be another article in the future.

For the moment some other insights are important to be presented in order to show that even for a laymen understanding the Carnot formula make no sense.

Here is a historical fact which shows the advantages of a high pressure steam engine over the atmospheric steam engine; the excerpt was found in Wikipedia page about Mr. Trevithick**.**

Draining the Peruvian silver mines

In 1811 draining water from the rich silver mines of Cerro de Pasco in Peru at an altitude of 4,330 metres (14,210 ft) posed serious problems for the man in charge, Francisco Uville. ***The low-pressure condensing engines by Boulton and Watt developed so little power as to be useless at this altitude, and they could not be dismantled into sufficiently small pieces to be transported there along mule tracks****. Uville was sent to England to investigate using Trevithick's high-pressure steam engine. He bought one for 20 guineas, transported it back and found it to work quite satisfactorily. In 1813 Uville set sail again for England and, having fallen ill on the way, broke his journey via Jamaica. When he had recovered he boarded the Falmouth packet ship 'Fox' coincidentally with one of Trevithick's cousins on board the same vessel. Trevithick's home was just a few miles from Falmouth so Uville was able to meet him and tell him about the project.*

As a conclusion form this article: ***it is obvious for anyone that efficiency of an atmospheric steam engine is related to the atmospheric pressure; when atmospheric pressure is low, the engine performs badly.***

In a previous newsletter, I demonstrated with an original experiment that even an internal combustion engine performance is related to the to the pressure outside the cylinder.

Is there any mention in the entire modern thermodynamics about such kind of efficiency dependence?

If one compares other historical information even more striking information can be revealed.

Here is an excerpt from a historical website which presents the advantages of high pressure steam engines:

They could be made much smaller than previously for a given power output. There was thus the potential for steam engines to be developed that were small and powerful enough to propel themselves and other objects. As a result, steam power for transportation now became a practicality in the form of ships and land vehicles, which revolutionised cargo businesses, travel, military strategy, and essentially every aspect of society.

Because of their smaller size, they were much less expensive.

They did not require the significant quantities of condenser cooling water needed by atmospheric engines.

They could be designed to run at higher speeds, making them more suitable for powering machinery.

The disadvantages were:

In the low-pressure range they were less efficient than condensing engines, especially if steam was not used expansively.

They were more susceptible to boiler explosions.

So, the historical data presents that one type of steam engine performs worse than another type of engine in a certain range of pressures, when in fact the theory preaches that performance was not dependent on the pressure at all....

The theory predict that the yield of a steam engine is related to the temperature!

In the new proposed theory the entire field of thermodynamics has to start from scratch ….

This type of engine has to be renamed as **atmospheric pressure engines**, because in the near future they are going to be put at work with other working agents instead of steam.

By switching to another working fluid the yield can be boosted with a conservative 30%; a new field of research has to be opened in order to optimize theory design and by sure other gains in efficiency are possible.

SECTION III USING EARLY STEAM ENGINES PRINCIPLE TO BOOST THE MODERN WORLD ELECTRICITY PRODUCTION

In a previous newsletter it was demonstrated that the yield of a power plant working with evaporation-condensation can be boosted with a conservative 20%, and most probably with an realistic 30%, by switching from water to another more appropriate working agent.

The following procedure can bring still another boost in the electricity production in such power plants working with evaporation-condensation.

Although the early steam engine principle has fallen in desuetude, there is a lot of potential for the future to reconsider this situation and generate mechanical work in this indirect way.

This section demonstrates a simple application of the condensation effect and the work which can be produced by the gradient of pressures as demonstrated in the previous sections.

The exemplification is made for a present power plant working on steam, but the same idea applies to a future power plant using another working fluid.

The idea of this section is simple: ***after passing from the turbine, one can still use steam „the wrong way" in order to boost the production of a common power plant.***

The schematic of a modern coal power plant working with steam is presented in fig. 28.

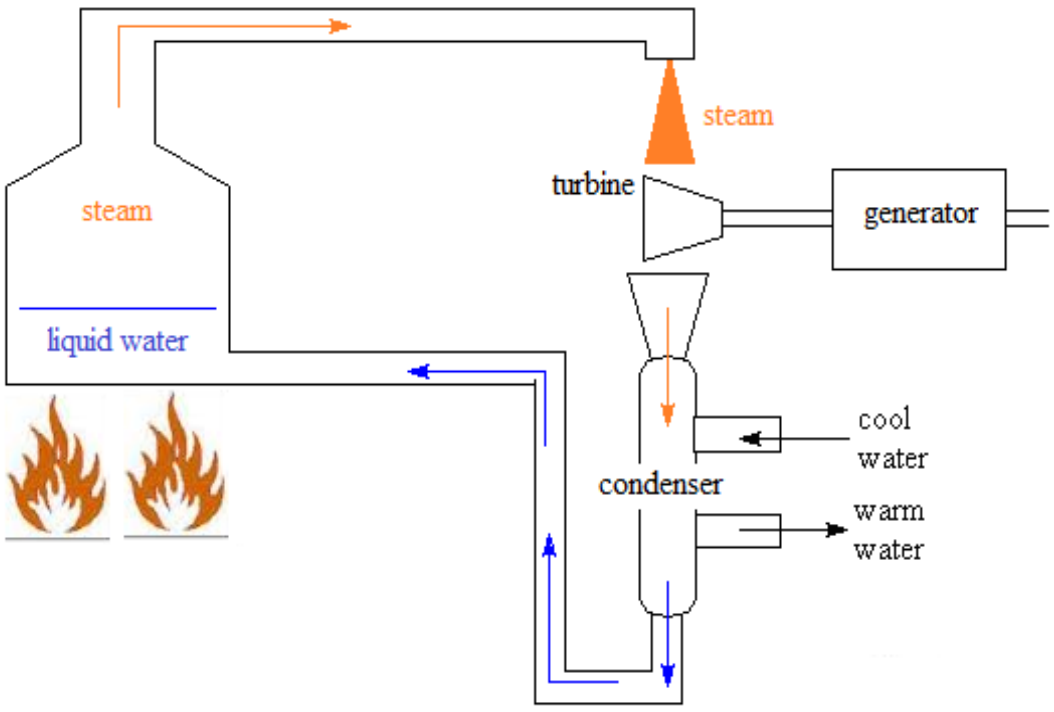


Figure 28 Functional power plant working with steam

Steam produced by boiler, after producing mechanical work on turbine, enters into a condenser where is cooled down and returns to the boiler as liquid making a closed circuit. The condenser release the excess heat into environment or in some cases part of it is recovered in a different way.

What happen with this steam if it is introduced into an atmospheric pressure type engine?

Do you think that for a cylinder-piston unit in the atmospheric pressure engine has any relevance the fact that steam is feed directly from the boiler or after it left the turbine in a existent power plant?

I suppose that for a simple laymen, the answer is evident....

As consequence, by combining some units from a common power plant with some units from the atmospheric pressure engine, a new hybrid system is assembled as in fig. 29, and very important to be underlined: this hybrid output is much higher.

In practice one can see that present power plants through away the steam after the turbine. In an atmospheric pressure engine, the most energy demanding step is to generate steam at atmospheric pressure. In our hybrid power plant, the steam is „for free". Instead of throwing the steam away, in this hybrid power plant this is guided to an arrangement of multi - atmospheric pressure type engines.

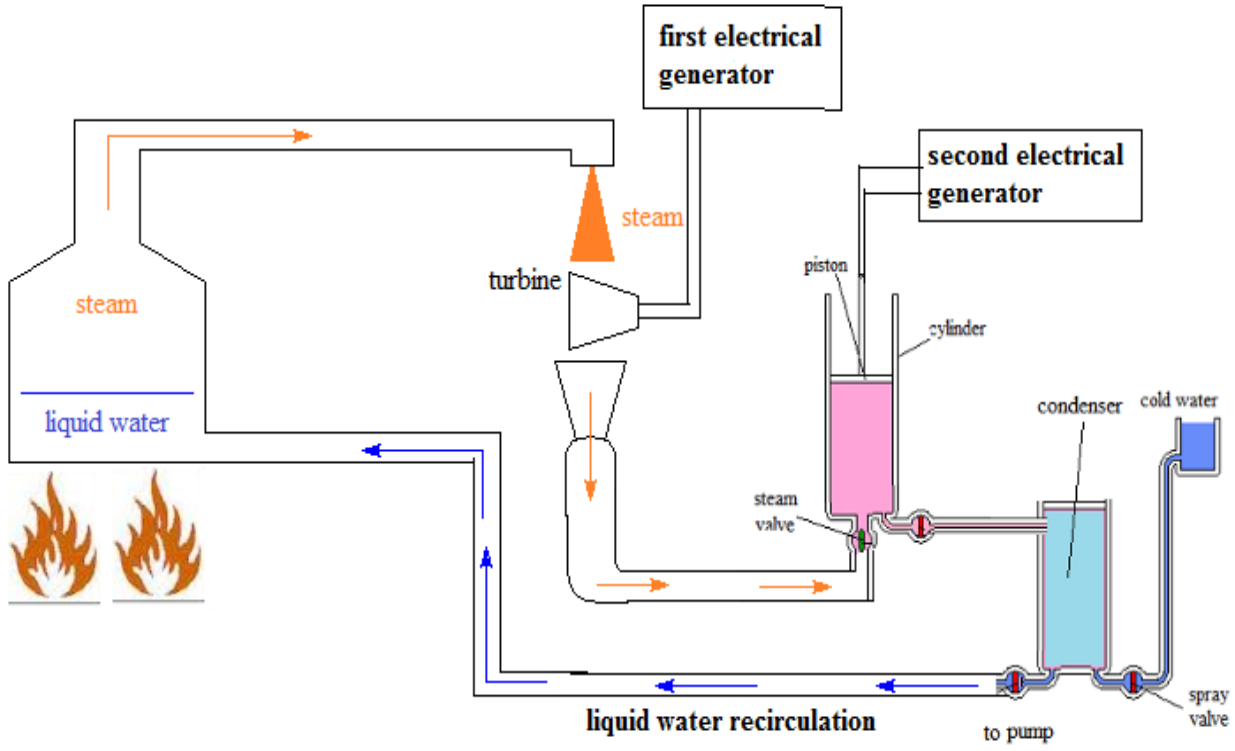


Figure 29

Of course for some people, this would seem to bring no novelty at all. Well, it is really true that looking from the schematic one would see only some new pipes, a new engine, some new valves, and nothing more.

Yet, at a detailed analysis, this device not only boosts the amount of electricity produced by a power plant, but also opens a new field of research and ***this kind of device is going to play a crucial role in establishing the new relationship between heat and mechanical work.***

Let us first see how this device is generating electricity in two different generators, one coupled at the turbine and the second one to the atmospheric pressure engine.

The steam coming from the boiler performs mechanical work in the turbine due to the pressure gradient and this is simple to be grasped even by laymen; this step is already performed by any power plant around the world working by evaporation-condensation.

The same steam is further directed into a series of atmospheric pressure cylinders (the number of cylinders has to be correlated with the amount of steam coming from turbine) and there is a second mechanical work generated by the heat of steam condensation.

Here it is very important to be underlined that mechanical work is generated by the fact that steam is condensed and the atmospheric pressure is in fact generating the work in order to compensate the variation of pressure in the cylinder.

The heat of condensation or the heat of evaporation is going to be used as a tool in establishing the relationship between heat and mechanical work.

For a pupil understanding things are very simple; not so simple for some theoreticians in the field, though!

Assuming that 1 mole of water and one mole of acetone are either vaporized or condensed, the heat consumed or recovered is much different, but the variation of volume is quite the same.

The molar heat of vaporization for water is 40.7 kJ/mol, but for acetone this is 31.0 kJ/mol. By evaporating a mole of water and a mole of acetone the variation of volume is quite the same. In gaseous state, a mole of any substance occupies a volume of 22,4 litres. Of course this volume is considered for ideal conditions and real conditions are a bit different from the ideal one.

By taking in consideration the departure from ideal conditions for water and acetone, and by taking in consideration the fact that in liquid state the volume occupied by one mole of each substance is a bit different, there is a flagrant discrepancy between the mechanical effect generated by one mole of each substance and the heat of evaporation or condensation of these substances.

In a laymen words, the consume for vaporization of a water mole needs about one third more energy as for acetone, but the mechanical work generated is quite the same.

The same thing happen in condensation. By condensing a mole of water more heat is recovered as for acetone, but the amount of mechanical work is quite the same.

Of course, in these days it is necessary to use the principle of early atmospheric pressure engines but to redesign it from scratch.

The exemplification was made for a coal power plant but the idea works for any present power plant which uses the evaporation condensation principle for producing electricity, nuclear included.

This line of research like many others, has to wait until some imbeciles having key position in science die and they are replaced by some new intelligent ones. If the process is going to continue as in present days (imbeciles replacing other imbeciles), then the humanity is condemned to wait longer.....

SECTION IV HOW NUCLEAR GARBAGE CAN PRODUCE ELECTRICITY

There are many applications for the recovery of mechanical work by condensing a gas into a liquid and here another example is provided.

I suppose the title of this section makes clear that I am not an advocate of nuclear energy.

The long term negative consequences of this endeavour outweigh the advantages, at least for the human society as a whole; for some greedy capitalists this activity makes sense as far they fool the public opinion about the real face of the nuclear danger.

One cannot expand at large scale this activity and damp part of the radioactive effluents into the ocean or into a natural body of water with the ,,motivation" that dilution is going to annihilate the negative effects of radioactivity.

Of course any country should be allowed to develop its peaceful use of nuclear energy, but in the same time any country should be obliged to confine the artificial produced radioactivity in its boundaries. Why are present nuclear power plants allowed to released controlled radioactivity into the oceans or directly into a natural body of water on the expenses of humanity and for the profit of some greedy ones?

If some apologetic of nuclear industry promote the idea that present radioactivity releases are not dangerous, then a better solution has to be advanced: Do spray these radioactivity residues from a plane over the land and anyone is going to see the consequences in a couples of years.

It is unacceptable that oceans or other water bodies, being the property of no one and in the same time a treasury for all of us, has to become the trash bin for a few chosen with negative consequences for all the others.

There is going to be an entire section in a future newsletter about the real cost of the nuclear energy and the impact on environment, but for the moment this newsletter deals with already existent used nuclear material, i.e. the so called spent nuclear fuel.

The term ,,spent nuclear fuel" is somehow misleading as far any material which still produce radiation is active and not spent. The ,,spent nuclear fuel" is material which is still active, but not useful for the present day nuclear reactors because the energy released is lees than optimum necessary for the nuclear reactor.

This application is designed as a tool to be applicable to the existent hundreds of tons of ,,nuclear spent fuel" which is kept in provisory storage until they are further encapsulated in glass or cement and prepared for long term storage.

In a French documentary about nuclear energy, there is an information that even the encapsulated solid nuclear garbage has to be ventilated (with air), otherwise they can arrive to 300C

temperature; these encapsulated pieces are kept at a certain distance one from others and air is circulated between, otherwise.... such garbage can start other secondary nuclear reactions...

It is curious that an army of theoreticians in the nuclear field have got this information and no one has advanced a procedure to use this generated heat for electricity production, instead of consuming energy for keeping them safe.

The exemplification bellow is made for the freshly removed fuels rods from a nuclear reactor. The same procedure can be used for the encapsulated spent nuclear material, but in this case more quantity of such material has to be immersed in the pool as far the reactions in solid materials have a slower pace.

When fuel rods in a nuclear reactor are no longer usable because the heat released is less than optimal heat for the reactor needs, they are removed from the reactor core and replaced with fresh fuel rods. The spent fuel rods are still highly radioactive and continue to generate significant heat for decades. The fuel assemblies, which consist of dozens to hundreds of fuel rods each, are moved to pools of water to cool. They are kept on racks in the pool, submerged in more than twenty feet of water, and water is continuously circulated to draw heat away from the rods and keep them at a safe temperature.

Because no permanent repository for spent fuel exists in most of the countries, reactor facilities have to keep the spent fuel at the reactor sites. In order to prevent the spent fuel from going critical, the spent fuel assemblies are placed in metal boxes whose walls contain neutron-absorbing boron.

This newsletter advocates that such garbage as far it is still producing thermal energy can be used for producing electrical energy.

Well, instead of storing these spent fuel material in water, a better solution is to store them in chloroform or another convenient freon with a lower boiling point and a lower heat of vaporization.

To date, an open pool of water is used, and the heat is removed from pools when water reaches a temperature of about 60 C.

In the new technological procedure, instead of a pool it is necessary to design a kind of boiler where the used nuclear material is submersed into freon as in fig. 30.

Instead of consuming energy to remove the heat from the spent nuclear material, in this new design the heat is used to boil the chloroform. There is no necessary an advanced control of this process, because the process of boiling takes place at constant temperature. More heat is released, more chloroform is transformed into gas and the control of the process is very simple.

As previously presented chloroform boils at 61,2 C and has a heat of vaporization smaller than water, i.e. 29.24 kJ/mol. Of course other freon can be used to tune the boiling temperature even

lower at about 50 C.

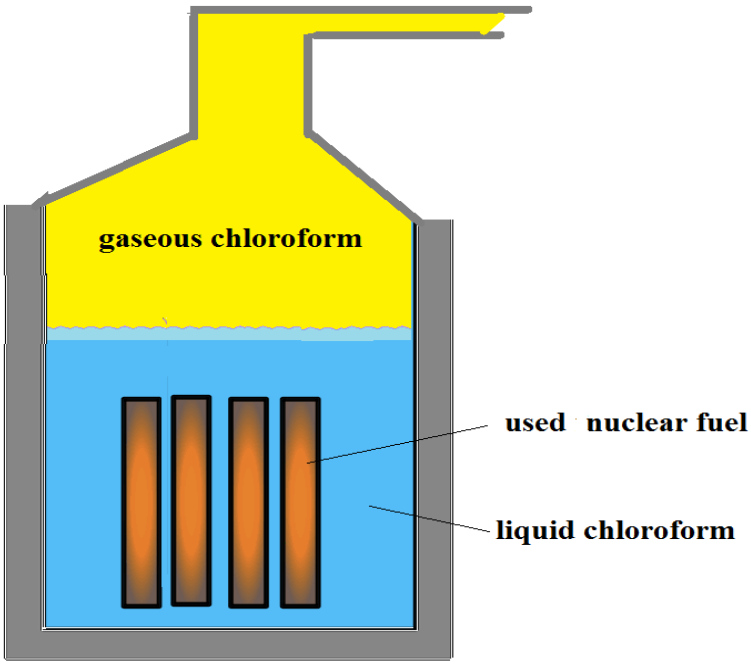


Figure 30

This temperature is going to stay constant in the boiler as far there is liquid chloroform to cover the nuclear fuel.

Well, as far this configuration produces vapours of chloroform for free, at atmospheric pressure, it is high time to do some mechanical work with them.

The simplest way to use these vapours can be envisaged by attaching the boiler to an atmospheric pressure engine; of course the condensation of vapours of chloroform has to be made with liquid chloroform – fig. 31.

Practically, in this new configuration we have an old atmospheric type of engine working on chloroform and powered by some nuclear garbage.

Why this hybrid can work with old atmospheric type of engines and not with an modern type of engine?

Well, in the atmospheric of engine, work is done by the atmospheric pressure and not by the expansion of gas into the cylinder. Practically, the vapours generated by this spent nuclear fuel is not enough to generate an significant pressure inside an modern engine, but in the old atmospheric engines, the amount of vapours necessary are much smaller.

Without doing any maths, this engine has to produce at least 1/3 more mechanical work as a similar engine working with water, but for the moment the theoretical aspects are not so important.

More important for human society as a whole is the fact that instead of keeping under control this nuclear garbage and consume energy for its cooling, the new procedure gains usable energy.

How does this system work?

Well there are no much differences from the classical atmospheric pressure engine. The main difference: the condensate which in this case consists of liquid chloroform has to be pumped and directed to a liquid splitter where a part of liquid is returned to the boiler and the rest is returned to the vessel with liquid chloroform for spraying.

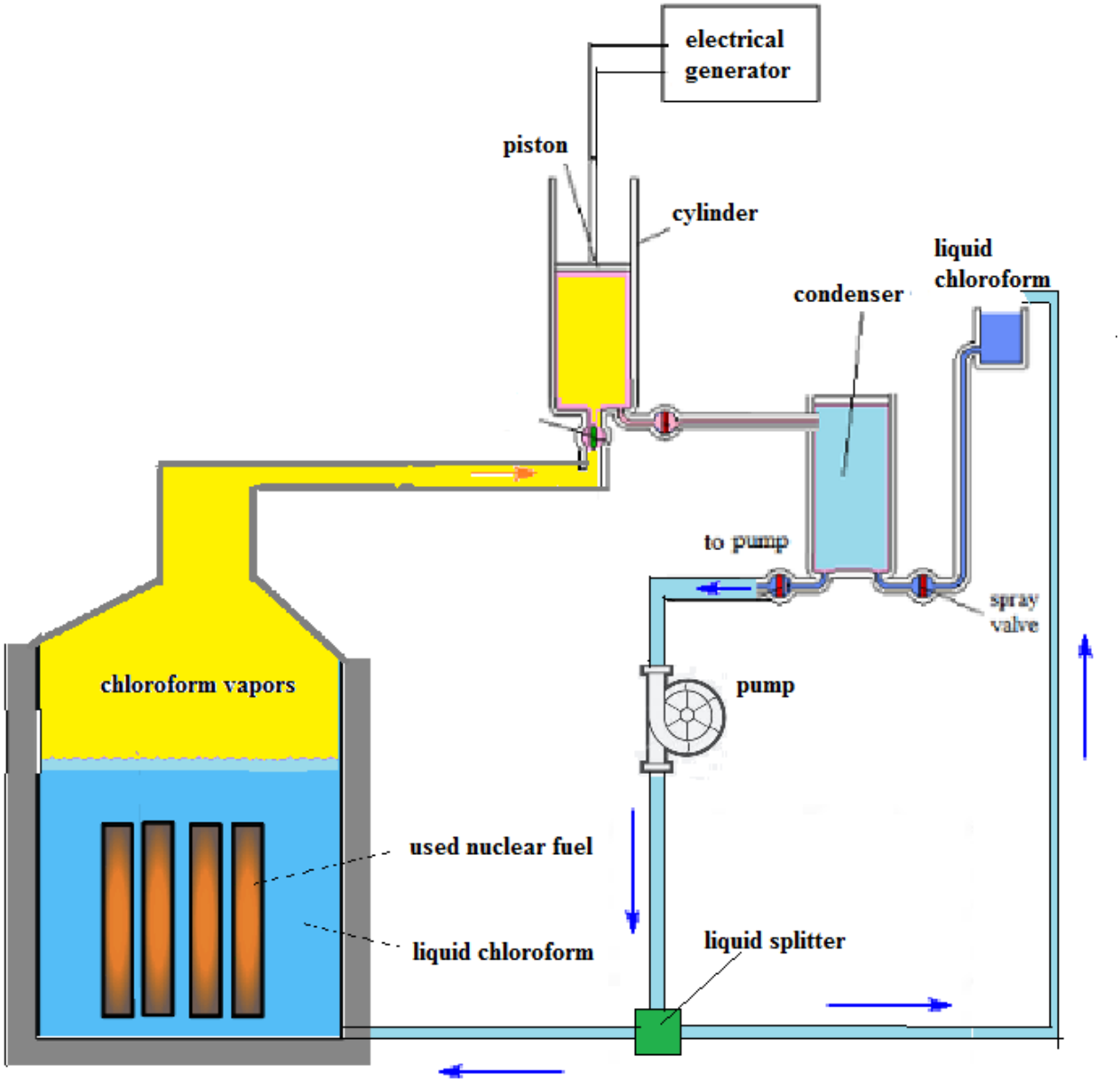


Figure 31

How long such system is going to work?

Well, as long the spent nuclear fuel is going to radiate ….

As decades passes, the heat released by the spent nuclear material diminishes. It is obvious that in this case, someone has to take the garbage nuclear material from two or three such devices and put them into a single one in order to have the necessary heat for vaporization.

In a future newsletter I am going to describe other applications of producing mechanical work by vapours condensation using a freon.

One is the case of a nuclear accident and another one is the use of solar energy to vaporize the freon.

SECTION V NUCLEAR REACTIONS AND E=mc² IMBECILITY

In a previous newsletter it was argued that nuclear mass defect rules out the mass energy equivalence formula.

Yet, by analysing each type of nuclear reactions other simple proofs to rule out the imbecility of mass energy equivalence formula pop out.

So let us see what happen for each main type of nuclear reaction in detail.

Gamma decay

It is the most and clearest evidence which rule out the mass energy equivalence formula, because during gamma decay the nucleus emits a high energy photon without actually changing its composition.

In the frame of present nuclear physics, in gamma decay, a nucleus changes from a higher energy state to a lower energy state through the emission of so called electromagnetic radiation (photons). The number of protons and neutrons in the nucleus does not change in this process, so the parent and daughter atoms are the same chemical element.

In the gamma decay of a nucleus, the emitted photon and recoiling nucleus each have a well-defined energy after the decay. The characteristic energy is divided between only two particles.

An example of gamma decay is Technetium-99m into Technetium-99, where 'm' stands for metastable, which in terms of an atom, ion or atomic nucleus, means that the atom is in an excited state:

$$^{99\mathrm{m}}_{43}Tc \rightarrow ^{99}_{43}Tc + \gamma$$

Most nuclear excited states are very unstable and "immediately" radiate away the extra energy after a time of the order of 10^{-12} seconds.

As a result, the the term of "nuclear isomer" is usually applied only to configurations with half-lives of 10^{-9} seconds or longer.

Usually, when an excited and a ground state of a nuclide are compared, anyone expects that ground state is more stable than any excited state. There is a remarkable exception I know and probably is not the only one., i.e. tantalum-180. The ground state of this particular nucleus, tantalum-180, is radioactive with a comparatively short half-life of 8 hours; in contrast, the meta stable state of this isomer occurring in nature has a half-life of at least 10^{15} years, longer than the age of the universe.

The origin of this isomer is mysterious, though it is believed to have been formed in

supernovae. Were it to relax to its ground state, it would release a photon with a photon energy of 75 keV.

Have you ever seen a gamma decay analysed from the energy-mass equivalence equation? I have seen none!

An excited state supposes that some more energy is accumulated in the system and this excess of energy has to be released back in order for the system to return to ground state.

If mass-equivalence is correct, then an excited state is a state of a system (nuclear, atomic) where more mass is acquired.

With this mass-energy equivalence a new definition for the excited state of a system has to be accepted and I suppose it is not necessary to go further with my analysis....

Further on, from the perspective of new theory, although not so evident at a first glance, even a gamma decay process can affect the electronic structure of the considered species, and this fact has been known for long time.

This fact supports one of the postulates promoted in a previous newsletter:

Postulate: Beside nuclear processes, a nuclear reaction supposes a complete rearrangement and energetic of electronic shells.

I am going to present an excerpt from an online text which justify the electronic rearrangements in case of gamma decay, but following another path:

https://www.britannica.com/science/radioactivity/Applications-of-radioactivity

*A third type of radiation, gamma radiation, usually accompanies alpha or beta decay. Gamma rays are photons and are without rest mass or charge. Alpha or beta decay may simply proceed directly to the ground (lowest energy) state of the daughter nucleus without gamma emission, but the decay may also proceed wholly or partly to higher energy states (excited states) of the daughter. In the latter case, gamma emission may occur as the excited states transform to lower energy states of the same nucleus. (**Alternatively to gamma emission, an excited nucleus may transform to a lower energy state by ejecting an electron from the cloud surrounding the nucleus. This orbital electron ejection is known as internal conversion and gives rise to an energetic electron and often an X-ray as the atomic cloud fills in the empty orbital of the ejected electron. The ratio of internal conversion to the alternative gamma emission is called the internal-conversion coefficient.**)*

……. Isomeric transitions.....

There is a wide range of rates of half-lives for the gamma-emission process. Usually dipole transitions, in which the gamma ray carries off one ħ unit of angular momentum, are fast, less than nanoseconds (one nanosecond equals 10^{-9} second). The law of conservation of angular momentum

requires that the sum of angular momenta of the radiation and daughter nucleus is equal to the angular momentum (spin) of the parent. If the spins of initial and final states differ by more than one, dipole radiation is forbidden, and gamma emission must proceed more slowly by a higher multipole (quadrupole, octupole, etc.) gamma transition. If the gamma-emission half-life exceeds about one nanosecond, the excited nucleus is said to be in a metastable, or isomeric, state (the names for a long-lived excited state), and it is customary to classify the decay as another type of radioactivity, an isomeric transition. An example of isomerism is found in the protactinium-234 nucleus of the uranium-238 decay chain:

$$^{234\mathrm{m}}_{91}Pa \rightarrow ^{234}_{91}Pa \quad + \gamma$$

It seems that an entire new types of reactions have been neglected by present nuclear science and these reactions are of utmost importance when we deal with radioactive contamination.

If I have an excited nucleus inside a living organism which instead of emitting a gamma photon, it eject an electron from an inner shell, then the entire story regarding the limits for contamination has to be started again from scratch. This is going to be done in a future newsletter though!

The gamma decay clearly shows that nucleons in nuclei, at least for higher Z and N nuclei, can have multiple arrangements and it is possible to jump from one state to another state. Quite similar to molecular isomerism in chemistry, there is a nuclear isomerism too.

This change of configuration in chemistry and nuclear processes is made with absorption or emission of energy and there is no way to justify the energetic of these processes by a mass energy conversion.

Alfa and beta-decay

Here, I grouped these reactions in a single subsection because it is simple to be observed by a pupil how these reactions rule out the mass equivalence imbecility.

As presented in a previous newsletter, these reactions are a clear evidence for the fact that during nuclear reactions electron shells are affected too.

In fact present nuclear science, for about a century, no one has observed that electrons are volatilized or materialized with a finger snap like in a magician trick...

I think I previously made an unpardonable error when I considered that nuclear physicists need an introductory course in chemistry. In fact they need an introductory course in arithmetic and learn again to count up to 100.

Let us consider a simple nuclear reaction; i.e. radon-222 undergoes alpha decay to form polonium-218.

The reaction is:

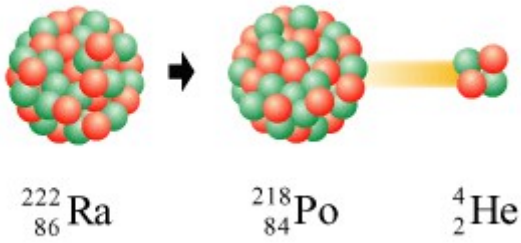


Figure 32

Because nucleons are conserved in this and all other nuclear reactions, the sum of the mass numbers of the products, 218 + 4 = 222, equals the mass number of the parent. Similarly, the sum of the atomic numbers of the products, 84 + 2 = 86, equals the atomic number of the parent. Thus the nuclear equation is considered balanced!

What about the electrons?

Well, the alfa particle is considered positively charged (see the experiments related to deviation of this particle in magnetic field) and consequently it does not carry electrons.

The parent specie – Rn had 86 electrons and the reaction product - Po have only 84 electrons.

Can a theoretician in the field explain where two electrons have disappeared?

It is a shame that for more than a century no scientist has ever seen that electrons must play a crucial importance for nuclear reactions although the most energetic processes take place in the nucleus.

The fact that Rn transmuted to Po must have as consequence a complex reorganization for the electronic shells.

Of course Rn has to expel two electrons too in order to transmute to Po!

If these electrons are expelled from inner shells a complex spectra with emission lines in X-ray, UV, VIS, IR has to be observed.

If these electrons are expelled from outer shell the situation is more complicated because sometimes most or all outer electrons are involved in chemical bounds.

Anyway, even in this case a spectra in UV, VIS and IR has to be observed.

We have previously defined the new concept of temperature as a measure of outer magnels

interactions (see the newsletter about temperature). In case of such complex phenomena (energetic processes inside atomic nucleus, rearrangement of electrons with emission of photons) the everyday concept of temperature is not appropriate to describe what happen here.

A new concept has to be introduced and this is task for future studies….

Postulate: The common concept of temperature is not appropriate for describing nuclear reactions.

It is obvious that such reaction rules out the mass energy equivalence formula too. As far two electrons volatilized into „energy", there is about 1 MeV missing in the energy balance.

Similar facts are observed in case of beta decay and here is an exemplification for ^{14}C decaying to ^{14}N. The conservation of so called electric charges appears to be respected for the nucleons. There are six protons in the carbon nuclide, i.e. a positive +6 charge before the reaction. After the reaction the total charge remain +6 as far there are the existent six protons and one neutron is transformed in one proton and one electron. Yet, the generated nitrogen nuclide has seven electrons around the nucleus and the carbon nuclide had only six.

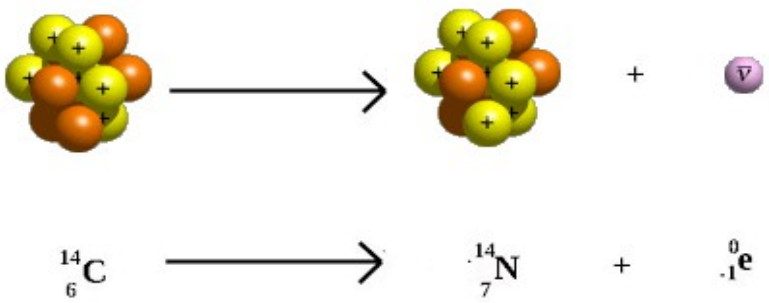


Figure 33

How is possible that one electron appears from nothing?

As far the mass energy equivalence assumes that one electrons is about 0,5 MeV equivalent energy, it is obvious that the energetic of the reaction is not balanced.

Is it worth to speak about the conversion of mass into energy when the energetic of these reactions is faked and fitted to the expectations?

A new postulate is necessary in order to plough the way for the future.

Postulate: Mass and energy are completely different physical units.

The entire nuclear structure and stability is related to this nucleons arrangements in the nuclei and this topic has to be reformulated from scratch...

SECTION VI THE FIRST NUCLEAR INCIDENT IN UNIVERSE

This is a parody to the imbecility of Big Bang theory and in the same time a special dedication to Mr. Jim Peebles. As it is well known, he received the 2019 nobel prize for contribution to cosmology, mainly Big Bang theory and other smaller imbecilities.

The sections makes a detailed analyses about what happen in the early universe when the deuterium formed – the so called deuterium bottleneck.

According to the official story, in the very early universe for a specific time interval, when the temperature was still very high, there were equal numbers of protons and neutrons. This happened during the so called lepton era: 10^{-5} sec <t<~10 sec. The temperature decreases such that kT is significantly lower than the rest mass energy of the proton (m_p = 938 MeV).

The lepton era ends when the radiation temperature drops significantly below 5×10^9 K and the plasma era begins: 10 sec <~t<~10^{13} sec. At this moment, the universe consists of photons, electrons, protons and neutrons (the story of neutrino and its non existence is a future topic!). Free neutrons decay within a very small interval of time, so it is a must that they have to be involved in nuclear reactions immediately; otherwise the entire construction of heavier atomic nuclei is very complicated to be imagined and the Universe would remain filled with ^{1}H....

It is assumed that Big Bang Nucleosynthesis (BBN), i.e. the creation of light elements from the protons and neutrons in the early universe, took place mainly at the beginning of this plasma era – fig. 34. In more specific details, BBN had to take place between 3 MeV and 10 keV temperatures and a scale of cosmic time window between 1 to 10^4 s.

It is further assumed that elements were formed by first creating the simplest possible nucleus. i.e. deuterium and then adding particles to create more complicated nuclei.

Because deuterium has a nucleus that is very weakly bound compared with most other nuclei, it is very sensitive to the conditions in which it is formed. In order to form deuterium there are two very important conditions to be fulfilled: it can only be formed when there are still free neutrons to combine with protons and only if the temperature is suitable for this nuclide formation. If the temperature is to high, deuterium breaks apart and if temperature is too low, the reaction cannot start.

So, from the initial hot Big Bang state, the Universe had to cool enough to allow the formation of deuterium and after that this nuclide could be used for building other superior mass nuclides. This is called the deuterium bottleneck, because the entire chain of ulterior nuclear processes had to wait until deuterium is formed.

At a first look, one would expects deuterium synthesis to begin when the kT term is approximately equal with deuterium bonding energy. However, it is assumed that excess of photons of high energies can still dissociate deuterium even when kT is significantly below deuterium bonding energy. Only this assumption need an entire new section, but it is not the case to insist now.

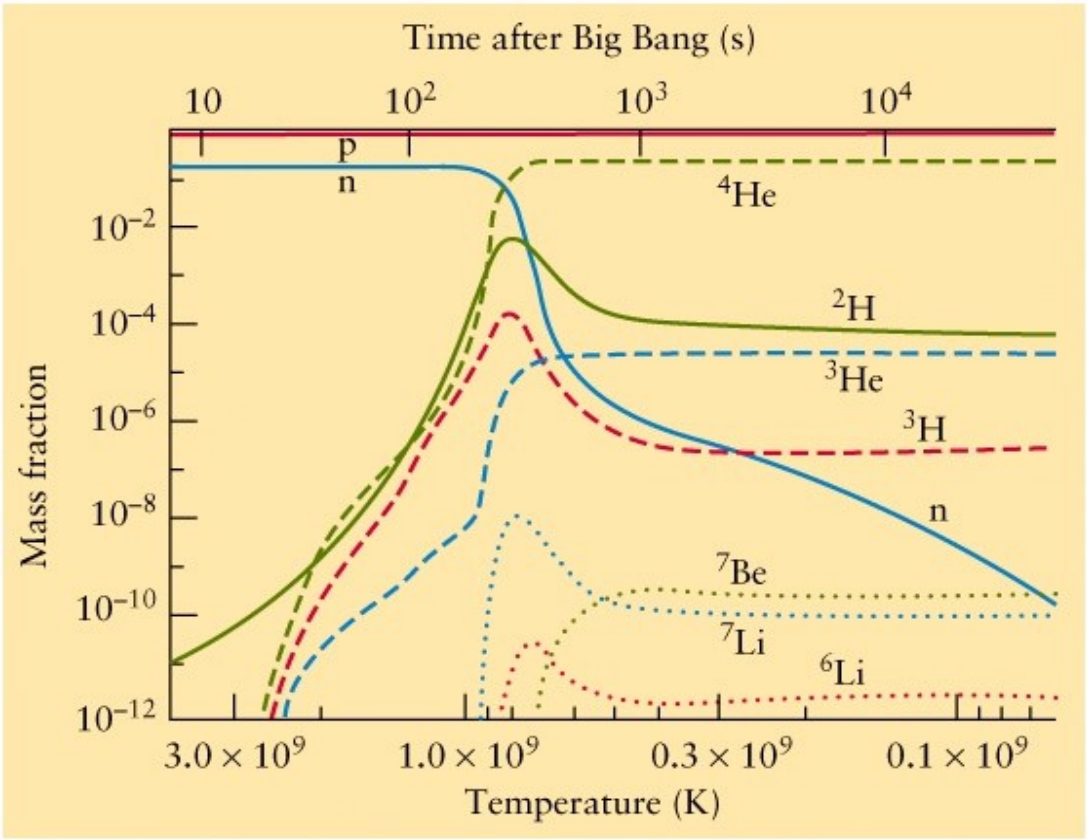


Figure 34 (internet reproduction)

So to resume, the key fusion reaction according to BB fanatics is:

$$n + p \rightarrow D + \gamma \qquad Q = 2{,}2 \text{ MeV}$$

Neutrons are in this case kept stable inside deuterium nuclei and at this stage the ratio N_D/Np is considered to be approximately 1/6; this ration is further used to explain the composition of the Universe and its further evolution.

Immediately, and based on the existing deuterium, an entire chain of reaction takes place and ^{3}He, T, ^{4}He and a bit of lithium are formed based on the reactions 3 up to 12 in the schematic presented in fig. 35.

This is the nice and idyllic image offered by Big Bang fanatics, but it is high time to see how flawed and absurd this image is! Let us compare the conditions from the beginning of plasma era after Big Bang with what is supposed to happen inside a common star.

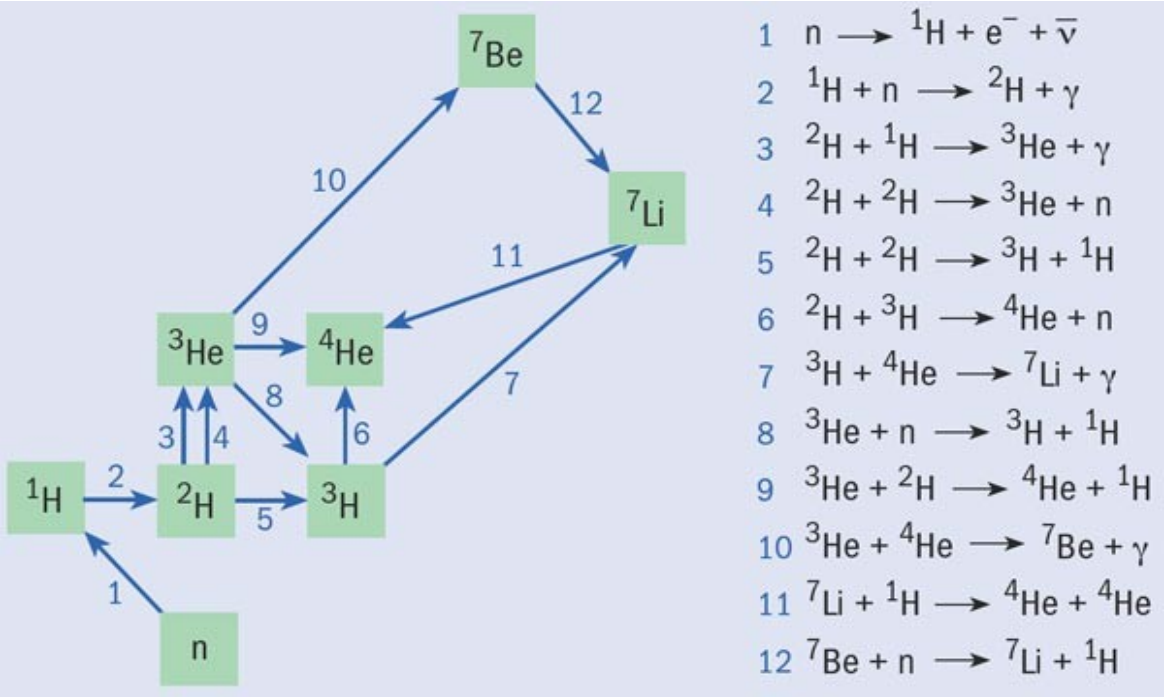


Figure 35

The density of plasma in the core of our Sun is supposed to be about 160 g/cm3 and the temperature is about 15 millions K. Under these conditions protons (^{1}H) react with other protons to make deuterium nuclei and positrons – fig. 36 ; the chain of reactions is supposed to continue up to the ^{4}He production.

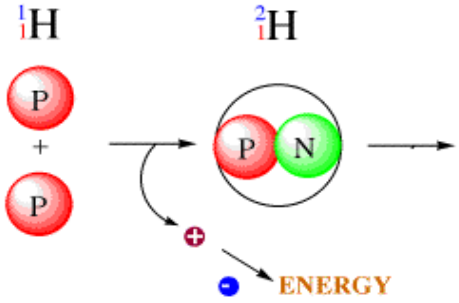


Figure 36

Of course the reaction between protons has a very small pace for a Sun like star, but it is interesting to see what happen in case of more massive stars.

As the mass of the star increases, the temperature inside their core increases so the speed of this reaction increases too; therefore massive stars burn their hydrogen in a couple of millions years, much rapid as our Sun which is supposed to last for at least 10 billions years.

Even a pupil can spot the basic idea that similar processes should have taken place during the BBN too. As far the reaction between protons is favoured by an increased temperature, it is obvious that such reaction had to take place with a considerable pace even before the formation of deuterium from protons and neutrons.

Why an entire army of theoreticians, Mr Peebles included, did not take into consideration this possibility and practically they themselves undermined the idea of a solid theoretical background for the Big Bang imbecility? .

Is there a reason for protons to not react with other protons at temperatures even higher then the equivalent of 2,2 MeV?

There is no such reason and the consequences are a bit disastrous for the n/p or for later N_D/Np ratios.

It is important to be highlighted that knowing the n/p and further N_D/Np ratios accurately is considered crucial for making accurate predictions for the further light element abundances.

Practically, by taking into consideration this reaction between protons, before the reaction of deuterium formation, the number of neutrons is increased and the number of protons is decreased, and thus the expected ratios between n/p or N_D/Np are altered.

Of course, the situation is not so simple after the Big Bang as in case of stars, because the deuterium formed at high temperatures by protons reaction is photo-dissociated back into a proton and a neutron.

Here is what can happen with deuterium and how these transformations affect supplementary the ratio n/p:

$p + p \rightarrow D + e^+ + \gamma$

$D + \gamma \rightarrow n + p$

The generated positrons and neutrons can be further involved in other secondary reactions and the entire situation get even messier.

Yet, the conclusion is simple: ***the ratios between n/p or N_D/N_p cannot be a support for the Big Bang theory and tracking back this ratio to the first nuclides formation is pure imbecility.***

Further on, there is no way to predict that after this hypothetical Big Bang, the universe arrives to about 25% mass helium and about 75 % hydrogen with traces of other elements.

Well, this was only an introductory lesson for Mr Peebles and his gang because as underlined in a previous newsletter, it is impossible to talk about nuclear reactions without taking into consideration the thermal effects. The entire theory of Big Bang neglects the thermal effects of nuclear reactions and this is an unpardonable imbecility.

Let us consider that the succession of reaction during the deuterium bottleneck preached by the Big Bang fanatics is correct and see what happen if thermal effects are taken into consideration.

For the simplicity, a ,,hypothetical reactor" containing a certain amount of reagents (protons, neutrons in a certain ratio) is considered.

The initial temperature of the reagents mixture (T_0) is considered close to the temperature where the concentrations of products (deuterium) is equal with the concentrations of neutrons (the protons are in excess so this simple fact is going to shift the equilibrium to the right).

$$n + p \leftrightarrow D + \gamma$$

I have serious doubts that by cooling this reactor, as it is supposed to happen after the Big Bang, other succession of nuclear reactions are going to take place in this mixture of neutrons, protons and deuterium. This is only my doubt, and not supported for the moment by a clear justification so, let us go further and admit that based on this mixture of n, p and D, other nuclides forms. It is obvious that having some new fusion reactions a supplementary heat of reaction is generated inside the reactor:

Here are the accepted reactions which could take place and the heat of reaction generated:

	product:	binding energy:
$D + D \rightarrow {}^3He^{++} + n$ $p + D \rightarrow {}^3He^{++} + \gamma$	^3He (ppn)	7.72 MeV
$n + D \rightarrow T + \gamma$ $D + D \rightarrow T + p$ $n + {}^3He^{++} \rightarrow T + p$	Tritium (pnn)	8.48 MeV
$n + {}^3He^{++} \rightarrow {}^4He^{++} + \gamma$ $D + {}^3He^{++} \rightarrow {}^4He^{++} + p$ $p + T \rightarrow {}^4He^{++} + \gamma$ $D + T \rightarrow {}^4He^{++} + n$ ${}^3He^{++} + {}^3He^{++} \rightarrow {}^4He^{++} + 2p$	^4He (ppnn)	28.3 MeV

By sure no theoretician has ever heard about the so called ,,oscillating chemical reactions", and I never heard that such type of reactions are possible in nuclear field, up to this moment!

Yet, based on the present frame of nuclear physics, in these conditions, an oscillating series of nuclear reactions have to take place inside the reactor.

So, the deuterium starts to react and form a certain amount of tritium, Helium-3 and Helium-4. The heat of collateral reactions is going to increase the temperature of the reactor and most of the deuterium had to be dissociated back in proton and neutron in these conditions:

$$D + \gamma \rightarrow n + p$$

It is obvious that by significantly decreasing the concentration of deuterium species, the entire chain of reactions stops !

Now, if the reactor does not exchange heat with surroundings, it is going to be difficult for the reactor to cool down and start again the chain of nuclear reaction.

After Big Bang, it is accepted that expansion of the Universe acts as a method of cooling, so considering the entire early universe as a „nuclear reactor", after a certain time, the temperature decreases again and the formation of deuterium is again possible:

$$n + p \rightarrow D + \gamma$$

With deuterium in place, again the production of tritium, ^{3}He and ^{4}He rumps up and again the temperature increases in the reactor. An increasing temperature affects the concentration of deuterium, by decreasing it and the same succession of events repeats again …

How long this succession of events take place ?

Well, one has to take into consideration the heat produced in the reminded nuclear reactions and the amount of heat transferred „outside the reactor" in time.

For me, this is a futile endeavour. If this nuclear oscillating series of reactions are possible, then the entire Big Bang theory has to be reformulated, so anyway Mr. Peebles has received the nobel prize for nothing.

Ok, in order to be more precise, in case of the Universe as an reactor example, there is a series of dumped oscillating nuclear reactions because the system is going to change the composition as time goes on and the universe expands.

For me, the entire problem with deuterium bottleneck is only a „faked" situation which has no connection with the experimental reality, assuming that a Big Bang really took place.

Here is an video with an exemplification for chemical oscillating reaction to serve as example for the keen theoreticians in the nuclear field:

https://www.youtube.com/watch?v=PYxInARIhLY

Oscillating reactions – The chemical clock

I wish to Big Bang fanatics a warmly good luck for adjusting this theory again, because you need a humongous amount of it!

SECTION VII THE ENERGETIC OF NUCLEAR REACTIONS

In a previous newsletter an introduction to nuclear binding energy and its variation with number of nucleons in nuclei was presented - fig. 37.

Some of the nuclides with masses close to 60, have the maximum energy binding per nucleon and these are considered the most stable nuclear species.

The rationale for this peak in binding energy is considered the interplay between the electrical repulsion of the protons in the nucleus and the nuclear force. The nuclear force is supposed to keep protons and neutrons together at short distances, while protons repel each other because they are like charges. As the size of the nucleus increases, the strong nuclear force is only felt between nucleons that are close together, while the electrical repulsion continues to be felt throughout the nucleus; this leads to instability and hence the radioactivity and fissile nature of the heavier elements.

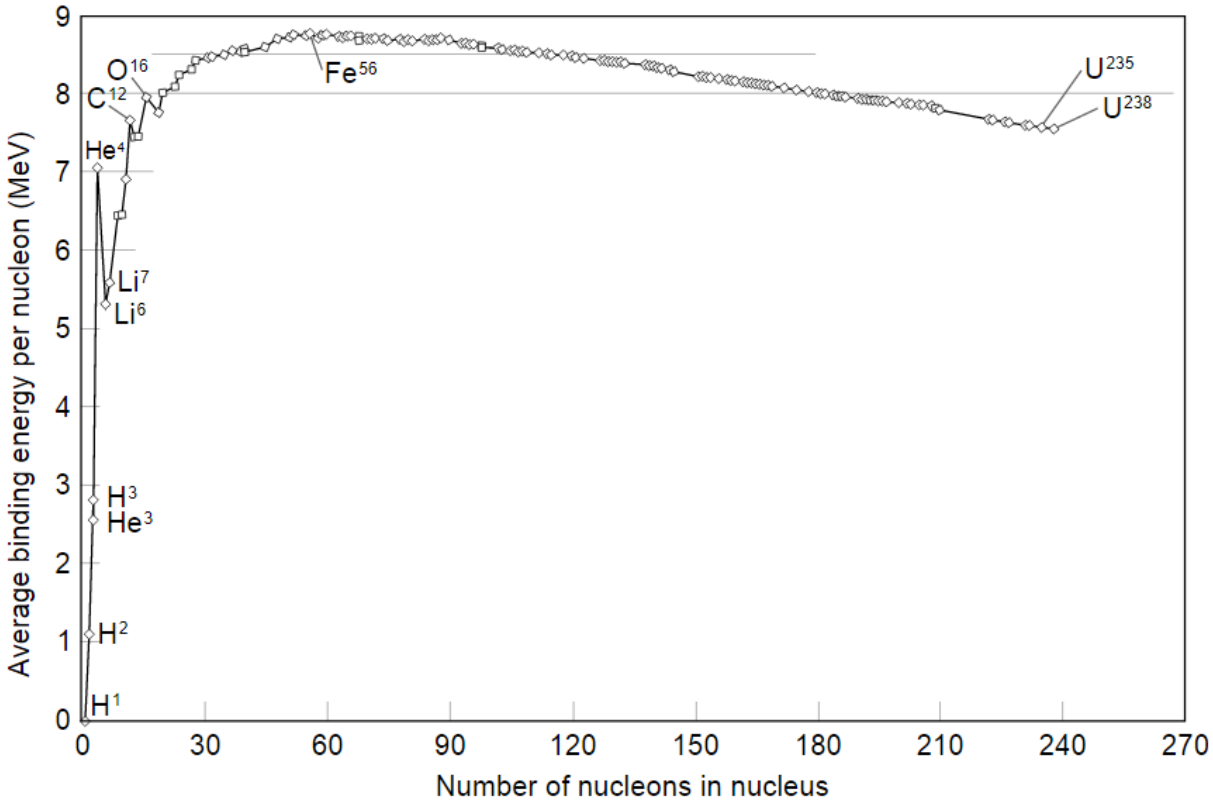


Figure 37 Variation of energy binding energy per nucleon

At the peak of binding energy, nickel-62 is the most tightly bound nucleus, followed by iron-58 and iron-56. This is supposed to be the basic reason why iron and nickel are very common metals in planetary cores, since they are produced in large amount as end products in supernovae and in the final stages of silicon burning in stars.

The curve in fig. 37 shows also that nuclides with low mass numbers can produce energy by fusion, when two light nuclei have fused to produce a heavier nucleus; in contrast heavier nuclides (i.e. mass numbers greater as 62) can produce energy by fission (disintegration) of their nuclei into two lighter nuclei.

In both cases, i.e. fusion or fission, the newly produced nuclei have greater binding energy per nucleon as before.

Well, apparently everything is nice and clear in the „theory" but let us see the situation in the field.

A first example is the case of Nichel-56, a nuclide which is close to the supposed island of stability. Although this nuclide has a binding energy of 8,642639 MeV/nucleon, it decay with a half life time of about six days. The binding energy per nucleon for Nichel-56 is very close to the maximum energy per nucleon for ^{62}Ni, ^{58}Fe, ^{56}Fe, ^{60}Ni. By comparison, Aluminium-27, although has a lower energy per nucleon as Nichel-56, it does not decay and theoretically is indefinitely stable. These binding energy values are presented in table 1 arranged in decreasing order of magnitude. Of course Nichel-56 binding energy can be compared with other nuclides having even lower energies per nucleon and which are stable or at least more stable as it.

Nuclide	MeV/nucleon
^{62}Ni	8,79449
^{58}Fe	8,79223
^{56}Fe	8,79036
^{60}Ni	8,78079
^{56}Ni	8,64263
^{27}Al	8,33155

Table 1

Probably, comparing different nuclides is not so convincing so it is worth to make a short presentation for a single element isotopes. Table 2 presents only some of the Aluminium nuclides, their binding energy per nucleon and their stability expressed as half live.

The expectation would be that more energy per nucleon a nuclide has, more stable this nuclide is.

Only at a visual inspection, it is clear that such theoretical expectations are not respected for Aluminium and the same can be proven for any other element's series of isotopes.

It is assumed by nuclear shell model, that protons are filling shells independent on neutrons, so it is obvious that Al, with 13 protons have to remain with an unpaired proton in all its nuclides. Aluminium-27 and Aluminium-26 although have an intermediate binding energy per nucleon are by far most stable isotopes. Aluminium-26 have also the most unfavorable configuration: one neutron remains uncoupled and one proton remains uncoupled.

One would expect that greater stability of the nucleus is going to be offered by paired number of protons and neutrons, but this assumption is not respected either....

NUCLIDE	Binding energy per nucleon in MeV	Half life	Units for half life
Aluminium-29	8,34873	6,56	minutes
Aluminium-27	8,33155	stable	
Aluminium-28	8,30989	2,2414	minutes
Aluminium-30	8,26138	3,6	seconds
Aluminium-31	8,22563	644	seconds
Aluminium-26	8,14977	717000	years
Aluminium-32	8,09918	0,033	seconds
Aluminium-25	8,02112	7,183	seconds
Aluminium-33	8,02084	0,000001	seconds

Table 2

In the new proposed theory, the binding energy is only a tool for estimating the energy necessary to be delivered or the energy expected to be released by a certain reaction and there is no direct correlation between the binding energy per nucleon and nuclei stability,

Of course, someone has to understand the „reality" of the physical world and not jump to easy conclusions.

Deuterium has an energy per nucleon of only 2,2 MeV and in comparison with other nuclei it should be a very unstable nuclide. In deuterium, according to the shell model neither proton, nor neutron has the possibility to form a pair, and so this nuclide should have a very short life time of maximum a few seconds. Contrary to these expectation, deuterium is indefinitely stable in certain conditions.

Of course, due to its low energy per nucleon this nuclide has a tendency to react in milder conditions in respect to other nuclides, but this is completely different story; the stability of a nuclide, although linked to the availability to be involved in certain reactions, cannot be limited to this assumption.

Last but not least, the situation of Uranium-235 and Uranium-238 has to be discussed.

In fig. 37 these nuclides are presented and it can be observed that they have close binding energy per nucleon, i.e. 7,59093 MeV per nucleon in case of Uranium-235 and 7,57014 MeV per nucleon in case of Uranium-238.

One would expect that these nuclides, being far away from the region of stability (^{56}Fe and its neighbours), would have quite the same tendency to arrive at a more stable configuration by some fission nuclear reactions; nothing would be more absurd than thinking that such assumption is true...

Uranium-235 has a half-life of 703.8 million years. Most, but not all neutron absorptions result in fission according to the reaction:

$$^{1}_{0}n + ^{235}_{92}U \rightarrow ^{141}_{56}Ba + ^{92}_{36}Kr + 3\ ^{1}_{0}n$$

A secondary reaction is possible by the capture of neutron and the formation of uranium-236.

By comparison, the half-life of uranium-238, the most dominant uranium isotope in nature, is very long, about 4,5 billion years.

Even more important uranium-238 is not so keen to be involved in nuclear fission at all; this nuclide prefer to absorb neutrons and transform into Plutonium-239 which in turn can be used for fission reactions.

Of course uranium-238, like quite any other nuclide, can undergo a forced fission with neutrons of high energies (more than 1 MeV), but this is a completely different story.

It is obvious even for a pupil that the assumption of a correlation between binding energy and stability of a nuclear specie has not a simple and linear dependency, if any!

Uranium-235 is interesting to still be discussed in respect to the so called fission cross section variation – fig. 38. As it is easy to be observed, the cross section is very large at low energies. This is where most of the reactions take place in a nuclear reactor.

The cross section for slow thermal neutrons is on the order of 10^2 up to 10^4 barns; for fast neutrons it is on the order of 1 barn.

By the way, a barn is an artificial unit of measure equals to 10^{-24} cm^2 and it was introduced in physics in a time a lot of farm boys where converted to nuclear physicists.

The complex structure at intermediate energies is assumed to appear from some "resonances". These are characteristic energies where the nucleus is easy to excite, much the same as the characteristic vibration frequencies of a guitar string.

Isn't curious that a neutron with an energy of 10 eV up to 100 eV is able to make resonate a

nucleus where the energy of interaction is 7,59093 MeV per nucleon, at once?

How is possible such a resonance in these conditions?

One would come with a classical situation from mechanics where a troop is marching on a bridge, a resonance phenomena is observed, the entire bridge enters in oscillation and even the bridge can be destroyed. In this case the resonance builds up, from smaller oscillations to larger amplitude oscillations caused by the marching rhythm.

Such conditions are not possible in case of a neutron hitting or being absorbed into a nucleus. In both cases the resonance cannot build up and even more outrageous, this neutron has no energy to generate an oscillation for other neutrons in a nucleus.

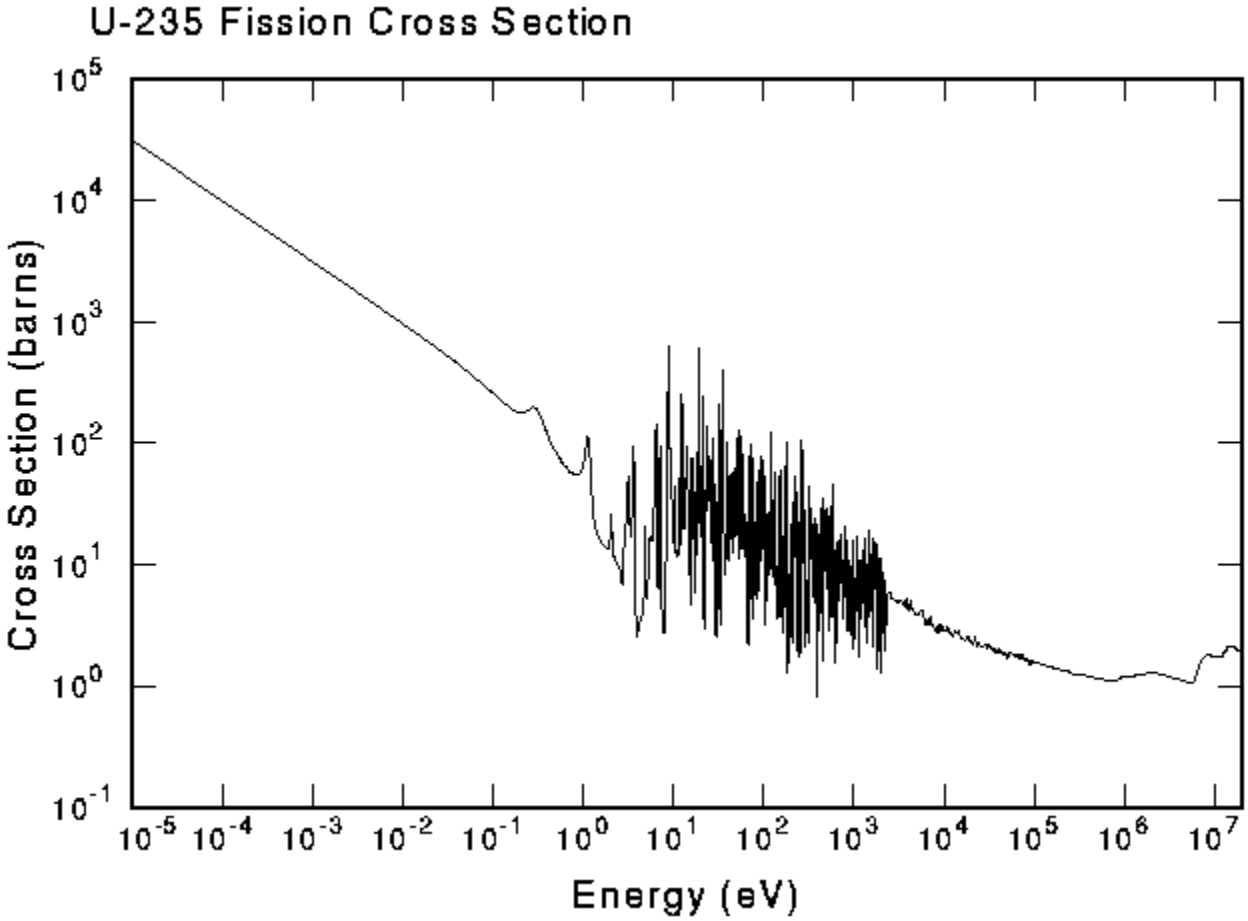


Figure 38 (from internet)

The guitar string vibration example is not appropriate for explaining nuclear resonance either! The fact that some vibration states are observed in case of such guitar string and a sound is emitted in air, it does not mean that chemical bounds in the guitar string are close to be broken by this resonance. The resonance in a string is a completely different type of resonance and has little to do with the destructive character of this phenomena.

Well, as far the farm boys era is still dominating the present nuclear science, I have to explain them in terms they understand what the variation from fig. 38 says.

Imagine you are a famous cowboy running after a heard of mustangs....

I do not know if there are still mustangs there, nor if there are still plains for them, but you have to force a bit your imagination, at least!

Assuming that you are such a skilled cowboy, by running after the heard and using your skills, you have the chance to catch one mustang. In this case you are in the A point - fig. 39, and I suppose it is clear for you what the coordinates of that point really means. Well, I cannot make quite the entire process of cowboys alphabetization here...

Yet, by doing nothing, i.e. being lazy and not running after the heard, another cowboy, gets the entire heard of mustangs and this case is represented by the point B in fig. 39.

What happen between points A and points B is too complicated for a cowboy mind, so, do not bother with such „details"!....

This up presented situation could have happen in reality, because horses in certain condition are quite sociable animals, but for the present nuclear physics, such situation is unacceptable.

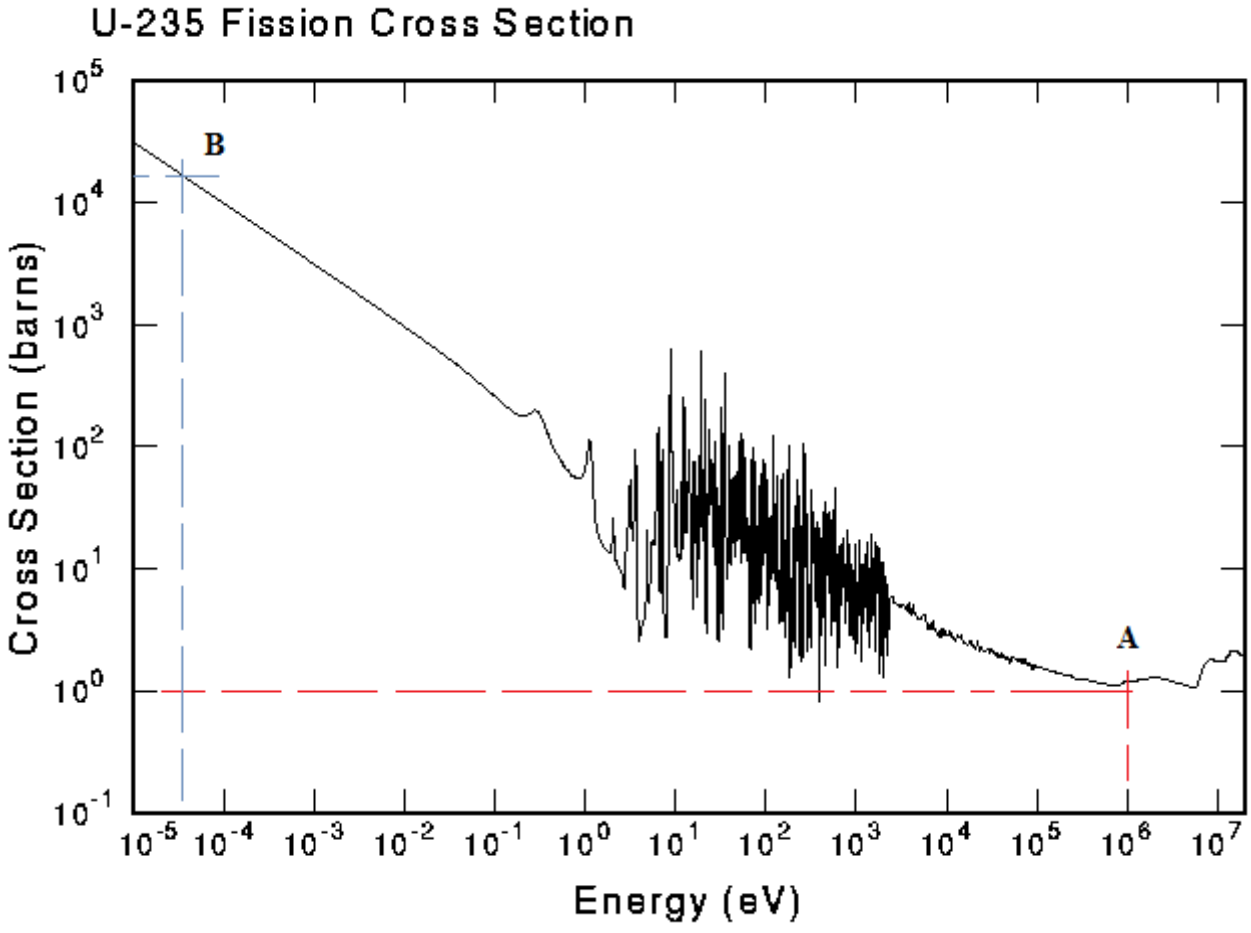


Figure 39 (from internet)

The entire foundation for the nuclear reactions was adopted from chemistry, without any critical analysis. In other previous newsletters. it was discussed that for usual chemical and physical processes, the kinetic molecular theory (KMT) and the accepted concept of temperature make no sense at all!

For nuclear processes, no one ever spotted that other completely new phenomena are taking place …...

The variation presented in fig. 38 and 39 is such a new phenomenon or a succession of new phenomena.

The expectations from the KMT are very simple to be grasped: by increasing the energy of reagents, the reaction between them has to proceed with a faster pace.

As consequence, by directing a higher energy incident particle to a target, there should be a greater probability to react with the target.

Let us make an exemplification for a uranium nucleus which is targeted by a neutron of high energy as in fig. 40. It is obvious that such a projectile could deform the nucleus in a first stage and later induce and rearrangement of so called nucleons shells with a split of the original nucleus in two separate nuclei.

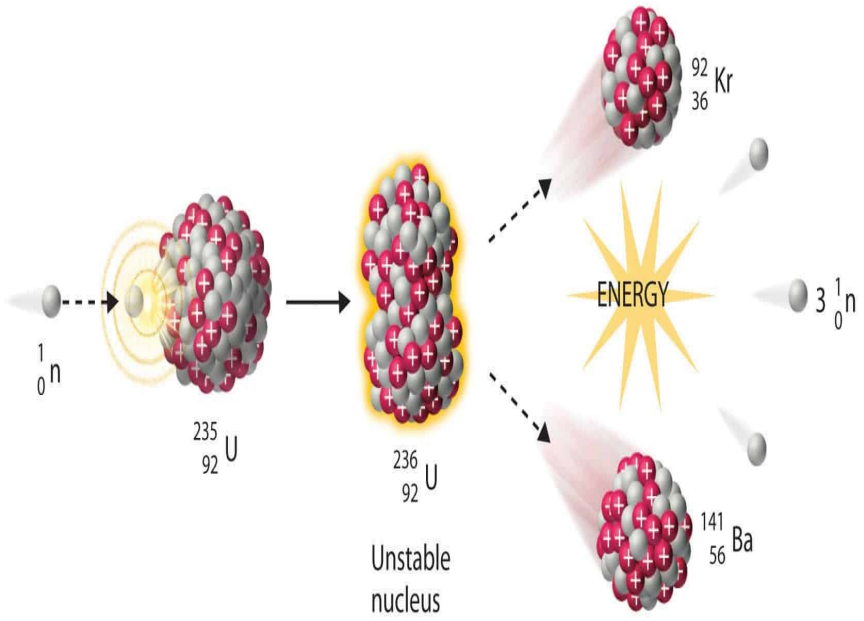


Figure 40

As far the target is fixed and only the neutrons are moving, KMT predictions are quite straightforward.

The nuclear cross section should depends on the type of atom we are dealing with; that is,

the greater the nuclear size, the larger the nuclear cross section. During nuclear reactions a particle collides with the nucleus and the cross section serves as the effective target area for the collision.

For uranium-235 nuclides the cross section for neutrons has to present a unique value, irrespective of the neutron energy. Yet, the experimental reality seems to be far from these predictions....

But this variation of cross section is not the „Gordian knot" of the entire situation.

The Gordian knot is given by another prediction of KMT, i.e. ***under a certain energy value for neutrons (the uranium target is fixed), the reaction cannot be started.***

By using some „stupid tricks" the cross section can be made variable, but this does not solve the main problem of nuclear reactions.

An energy of neutrons lower as such threshold energy would allow only a physical interaction between neutrons and nuclei; I would like to present only the case of elastic and inelastic collision as the representative types of possible physical interactions.

In case of an elastic collision, he neutron and the nuclide collide and share a part of their kinetic energies. They rebound with speeds different from the original speeds, such that the total kinetic energy before and after the collision remains the same. As far the uranium nuclei are stationary before collision, they will gain energy from the neutron, increase their oscillation in the lattice, and the neutrons get slowed down due to loss of kinetic energy.

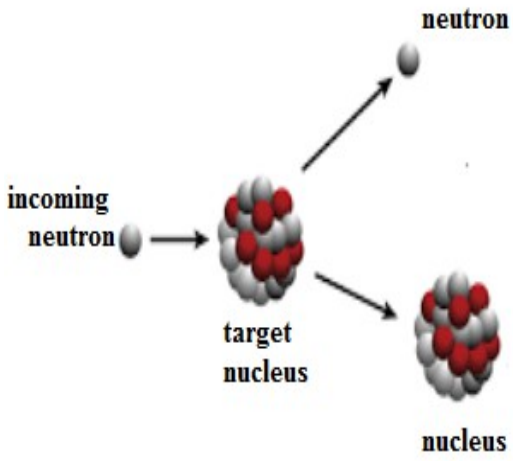


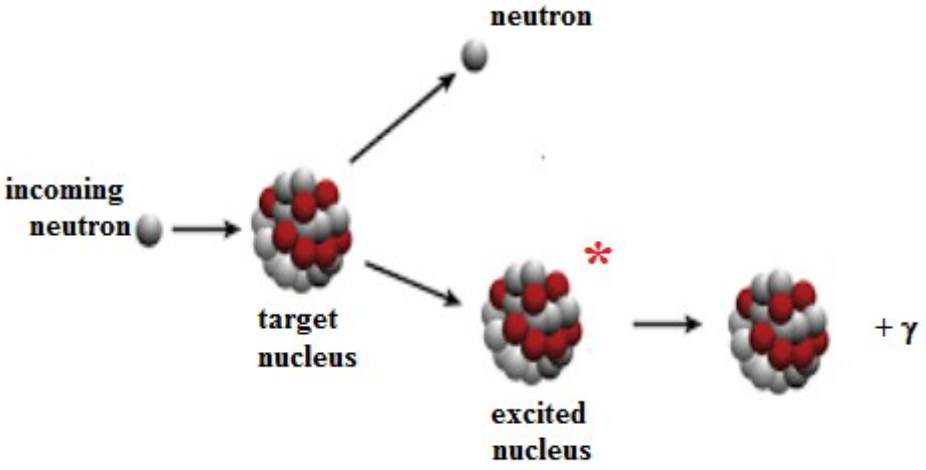
Figure 41 Elastic scattering of neutron from uranium-235 nuclei

In case of inelastic collision, a part of the kinetic energy is acquired by a nucleus as energy of excitation – fig. 42. Hence the total kinetic energy after the collision is less than that before the collision, and this difference accounts for the energy of nucleus excitation.

The probability of inelastic scattering is generally lower than elastic one and it is obvious

that incoming neutrons have to contain enough energy in order to excite the uranium nuclei (or other nuclides if other nuclear processes are considered). Inelastic scattering in heavy nuclides degrades the neutron energies heavily.

As it is obvious even for a laymen, an inelastic collision for the main fission reaction of Uranium-235, can become a secondary gamma ray reaction for the excited U-235 nuclei. The excited nucleus subsequently de-excites by emitting gamma radiation.



. Figure 42 Inelastic scattering of neutron from uranium-235 nuclei

Well, these are the main theoretical expectations from KMT and it is really true that such phenomena take place currently in colliding neutrons with a certain energy and uranium nuclei; similar processes take place in other nuclear processes too.

With such theoretical predictions, I think there would be little use of the uranium-235 fission reaction for producing energy or nuclear bombs.

In practice, the fission of Uranium-235 is guided by a completely different technique, which is in flagrant contradiction with the KMT assumption.

By observing the cross section variation, it is simple to deduce that lower the energy of a neutron is, greater is the probability to produce a uranium-235 nucleus decay!

As consequence, the technique for guiding this reactions supposes to lower the energy of the neutrons as much as possible, a few eV or even lower energies.

And the entire magic of the Uranium-235 decay is based on these ,,lazy walking" neutrons which have not enough energy to knock a nucleus at least!

In fact, uranium nuclei act as „traps" for these lazy walking neutrons and once they fall into the trap they are engulfed by nuclei.

In a cowboy understanding, one has to imagine the uranium nucleus as having a lasso and this is used to catch the neutron as soon the neutron enters in the ranging action of the lasso

– fig. 43.

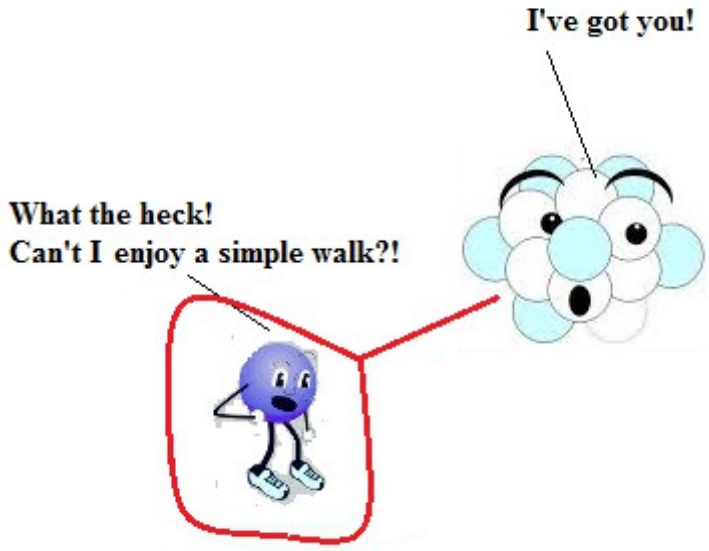


Figure 43

It is obvious that faster a neutron is, smaller is the probability of the nucleus to catch it -fig. 44 !

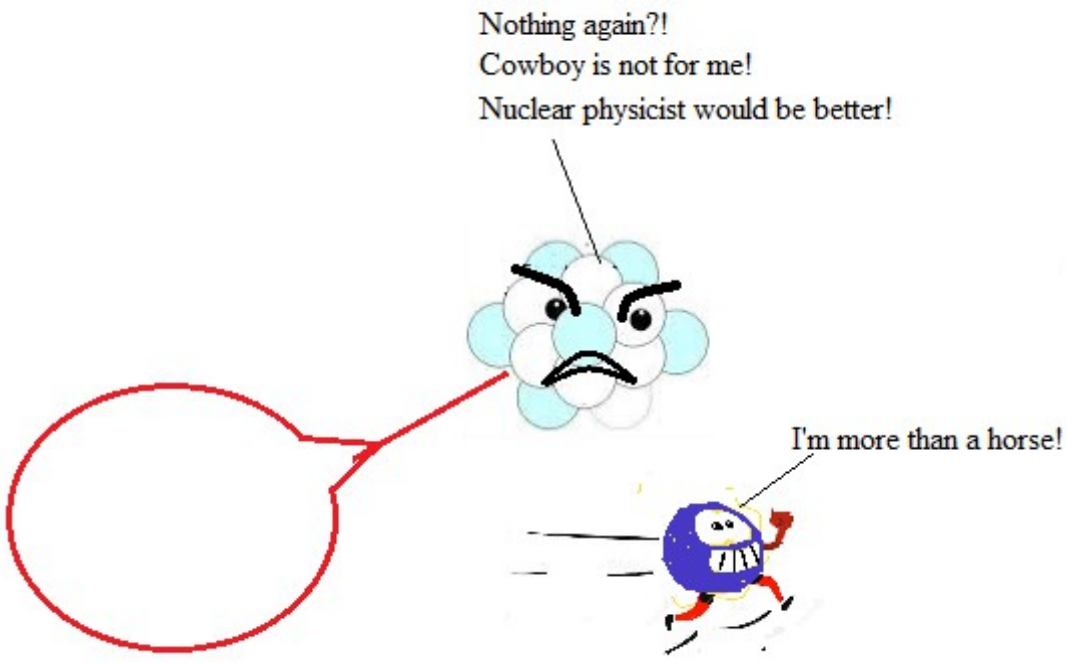


Figure 44

I think that such modeling of a nuclear reaction makes much more sense that the absurdity of KMT. In the same time, I suppose some new „farming units" have to be adopted in the nuclear

field: the lasso unit, the horse shoe unit, etc.

Maybe in the future a steak unit for weight is going to be adopted too...!

Now an international team has to be assembled to decide which steak size is more appropriate: the fat US one, the medium roasted European one or maybe look after other sizes available on the market....

This was only an introductory discussion for nuclear reaction. In the future, a more detailed analysis is going to be made and the comparison between chemical and nuclear reactions debated again. It is important to see how the conservation laws hold in both these processes and if the concept of activation energy can be used in nuclear processes too!

SECTION VIII STATIC AND DINAMIC TIME DELAY IN GR

Static time delay is a topic which in great part is already known to the GR fanatics.

It is assumed that such effect is one of the main tests for GR and the effect was predicted by Irwin Shapiro in 1964.

Curious enough, the father of GR, the big Einstein, missed to predict such effect!

Is it indeed so?

It is curious that no one spotted the imbecility and internal contradiction which is revealed by this ,,famous prediction of GR".

A ,,time delay" is a so ,,common sense fact" that it would not need any further explanation.

Unfortunately, the GR predictions have nothing to do with ,,time delays", but only with time distortions, which are completely different things.

A time delay means that something happen at a later moment as expected. A train is late from some reasons and the time delay is displayed on the station main screen.

A time distortion means that an temporal order of events is disturbed and basic concepts as future and past get messy. A time distortion cannot ever make a train to be late...

GR predicts that a gravitational mass distorts in a certain measure the space and time around it. Greater this gravitational mass is, greater are these distortions! Such distortion of time means that temporal axis get messy and one has to be careful when assuming a temporal order for a succession of events.

As consequence, Shapiro is of course wrong when predicted a time delay and second, if the measurements show such effect, this has to be a journey into the future or into the past....

If this effect were to be true, then time travelling would be as easy as a finger snap...!

There are other flows in this prediction so a more detailed discussion is necessary in order to spot them for a laymen understanding.

Another major flaws in the GR theory was spotted in a previous newsletter, when it was postulated there that time being a scalar type of unit cannot be bend.

If time gets bent, the concept of velocity concept makes no sense in science and the same is valid for light. If light velocity or light speed cannot be defined, it is obvious that someone cannot predict any time distortion!

$$c=\frac{d\vec{r}}{d\vec{t}}$$ -***mathematically not possible because the division of vectors is not defined***

Only these conceptual flows, for any common sense mind, would rule out the GR theory at

once! One has to redefine the entire physics if time can be distorted.

Let us go further and analyse this Shapiro experiment and predictions in details...

As assumed by GR, there is a deflection of light passing near massive objects – fig. 45.

The Shapiro time delay is considered to be a combined effect of the light slowing down when it passes near the sun and the extra length of the bent path.

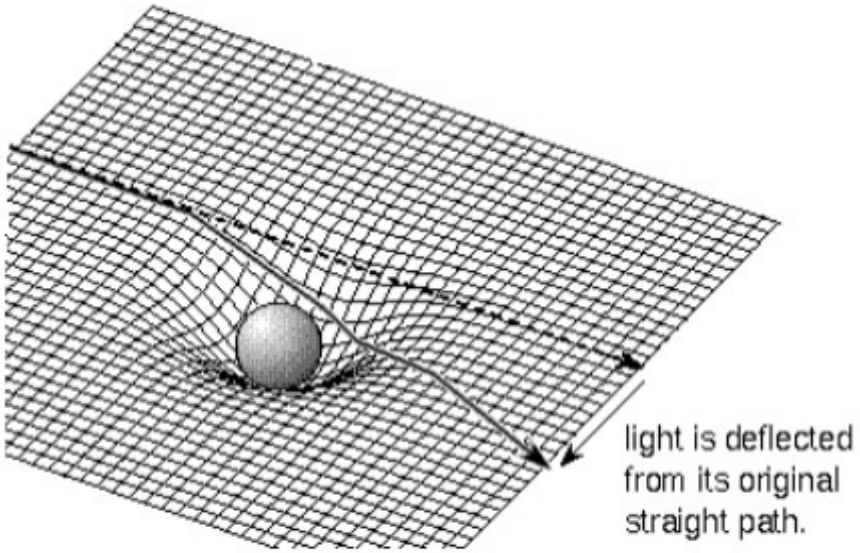


Fig. 45 deflection of light passing near massive objects

The setup for measuring the Shapiro delay problem involves two radio stations A and B, at large distances one from another and a massive object. A radio signal is emitted from A and travels to B. Upon receiving the signal, B transmits a signal back to A. The observer A measures the total proper time elapsed during the entire process in presence and in absence of the massive object.

The Shapiro delay was first measured in the 1960s with passive radar measurements of the inner planets, and subsequently later with active ranging experiments on interplanetary spacecraft.

It is considered that the experiments were successful and the observed delay confirmed the GR theory.

Is it really so?

Let us analyse a bit more the exact conditions these experiments were done, in the frame of modern science, without making any new assumptions.

Although Sun is still considered a ball of ionized gas (plasma), for the purpose of this experiment such a massive object is not at all appropriate. It is well known from antiquity and confirmed later in many different ways that Sun has a corona, which in modern terms means an atmosphere.

The entire GR and its later variations do not take into consideration the existence of this solar atmosphere and practically assumes that photons coming from the far away cosmic objects and passing tangent to the Sun are moving in vacuum for their entire trajectory.

We have to keep alive the „modern astronomy" which, further assumes that celestial bodies moves in a vacuum, so the atmosphere of any celestial body has a certain extent.

From the perspective of modern science, there are two different interactions for a photon or electromagnetic wave passing through the Sun`s atmosphere.

There is a gravitational interaction and a optical one and there is no way to separate one by the other. The optical interaction is simply a refraction phenomena and the effect is well known even for pupils.

As consequence, in the frame of modern science, an observer can detect only the overlapping of these effects acting on the photon.

If one is attributing the entire deflection of photon passing in proximity of a massive celestial body to the gravitational interaction, this would lead to another absurdity: photons have to travel through matter without any interaction, which is impossible.

The conclusion is simple: in the frame of modern science the curvature of a photon in the Sun atmosphere cannot support the GR theory at all!

It was previously presented that GR blows off the entire arrangement and structure of our Solar system too!

If for a photon in the closed proximity of Sun, the deflection is double as expected by the classical theory of gravitation, the same thing should happen even with a normal material body following a similar trajectory. The space-time warping for a material body in the gravitational field of the Sun should give an effect which is double as expected by the classical theory – fig 46.

There have been the so called grazing comets which are coming very close to the Sun and strangely, I haven't seen a single correction for these cosmic objects coming from GR part.

Even for planets, similar corrections have to be observed for each and any of them.

Only a GR fanatic can think that space time distortion can produce a „double size effect" for a photon and „normal size effect" for any other material body. For a simple laymen this is faking the data.

As consequence, the Shapiro predictions and all of the tests performed up to this moment related to GR have to be revised from scratch.

The situation is even more complex in the frame of new proposed theory, but this is a topic for a future article.

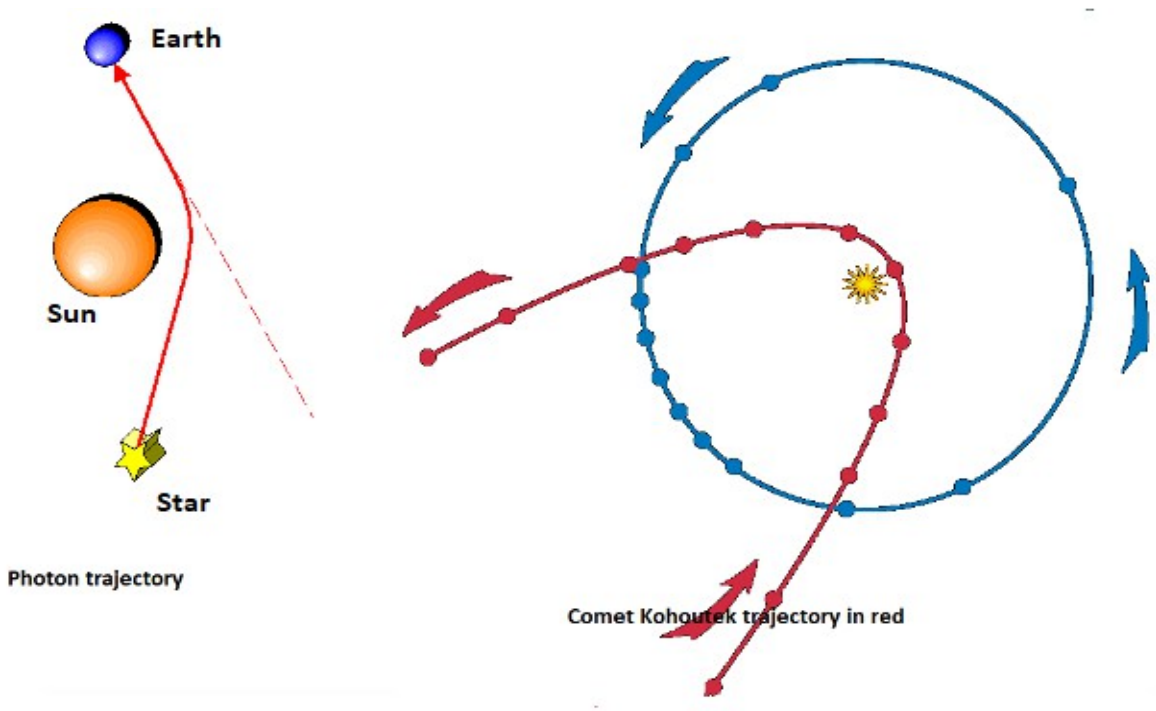


Figure 46 Photon trajectory compared with comet trajectory in Sun gravitational field

Assuming that up presented objections are going to be solved, GR fanatics have not observed that the simple existence of so called „gravitational waves" brings other naughty problems to GR.

Beside the „static time delay", one has to take into consideration that a „dynamic time delay" has to be still predicted for GR fanatics; I give them a helping hand, but I do not think this is in their favour....

Any wave travelling a medium affects some of the properties of the medium.

As already presented, GR assumes that any accelerated mass generates a gravitational wave and this wave is related to the mass which is accelerated.

If this supposedly existing gravitational waves affects the metric of space, by sure the motion of a photon in such region of space has to be reformulated.

Let us compare the motion of a photon in a region of space without gravitational waves and a region with gravitational waves – fig. 47.

The comparison is made in a certain framework:

- time is not deformed, because having a distorted time rules out the entire physics
- the unit of distance chosen is very small , i.e. $\Delta\lambda = 10^{-25}$ m.

As far the moderns science assumes that gravitational waves were predicted and these have strains of the order of 10^{-22} m, the unit of distance was chosen to be smaller than these supposed

waves.

In absence of gravitational wave the path of a photon is a straight line and of course the distance travelled is the summation of individual intervals of space; in our case the distance between **a** and **i** points is $8\times\Delta\lambda$.

In presence of a gravitational wave, the path of a photon is not a straight line at this level of magnification. The gravitational wave distorts the metric of space and the considered points are not aligned as previously, but they are occupying different positions in space. The photon in this distorted metrics follow a zigzag path, i.e. the red line in fig. 47.

A complete and detailed analysis of the total total distance travelled by the photon in this case have to be made by using the calculus methodology invented by Leibniz.

I am going to indulge myself in an approximate estimation using the flushing (fluxion) method assumed to be developed by Newton; well, in fact, it is simple and plain euclidean geometry.

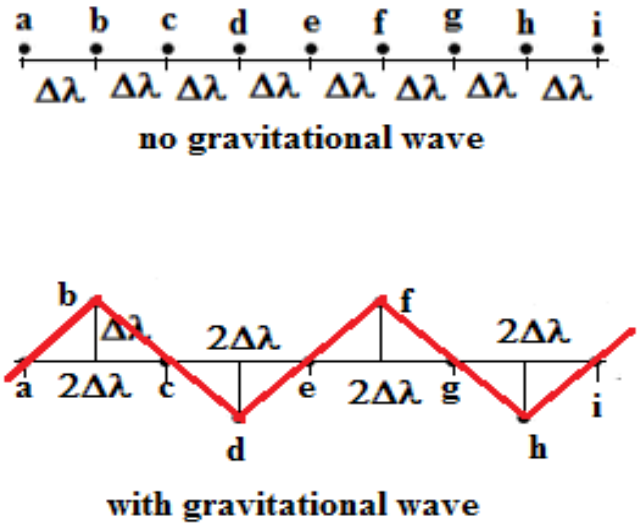


Figure 47 Photon trajectory in presence and absence of gravitational wave

In the presence of a gravitational wave, the path travelled by photon can be estimated as a summation of hypotenuses of isosceles right triangles based on Pythagoras theorem. The length of such hypotenuse can be easily found: $\|a\,b\| = \Delta\lambda \times \sqrt{2}$

The total path of the photon in this case is $8\times\Delta\lambda\times\sqrt{2}$

Even a pupil can observe that a gravitational wave must affect the path travelled by a photon and there is a factor of stretch which for our example is equal with $\sqrt{2}$.

In our case, I supposed that a distortion in space metric generates at a certain level a kind of

succession of right isosceles triangles, but this is only a special case; in reality, this stretch factor has not a fixed value and depends on the metric distortion.

Going further with our example, assuming that light speed is constant, even a pupil can estimate that the time for travelling a certain distance is different in presence or in absence of a gravitational wave.

In absence of a gravitational wave this time is : $8\times\Delta\lambda/c$

In presence of a gravitational wave this time is: $8\times\Delta\lambda\times\sqrt{2}/c$

As expected, an gravitational wave introduces a delay in the signal travelling from any event.

As far in astronomy, far away events are observed, the delay introduced by a gravitational wave is considerable and can be even a multiple of the the normal time observed in absence of a gravitational waves.

Postulate: Any change in the space-time metric affects the measured distances and the temporal order of the events in that region of space.

So, if astronomy wants to play with such things then any imbecility can be tolerated and this is the case of tons of literature in the present day astronomy.

By ruling out the imbecility of GR, the new theory is not going to tolerate any change of space or time metrics; as consequence, order and clarity are going to return again in the theoretical approach of cosmic events.....

SECTION IX THE WORTHINESS OF 2019 NOBEL PRIZE FOR PHYSICS

In another newsletter I already made some considerations about the 2019 nobel prize in physics.

I promised to come back with some new information, but I think it is better to keep this section short and not waste your and my time for nothing.

The fact that nobel committee appreciated the entire life work of Mr. Jim Peebles as worth a nobel prize is, by sure, going to be considered a tragic accident soon.

More tragic is, from the perspective of common laymen, the fact that they did not find some additional money in order to pay a speech writer for him.

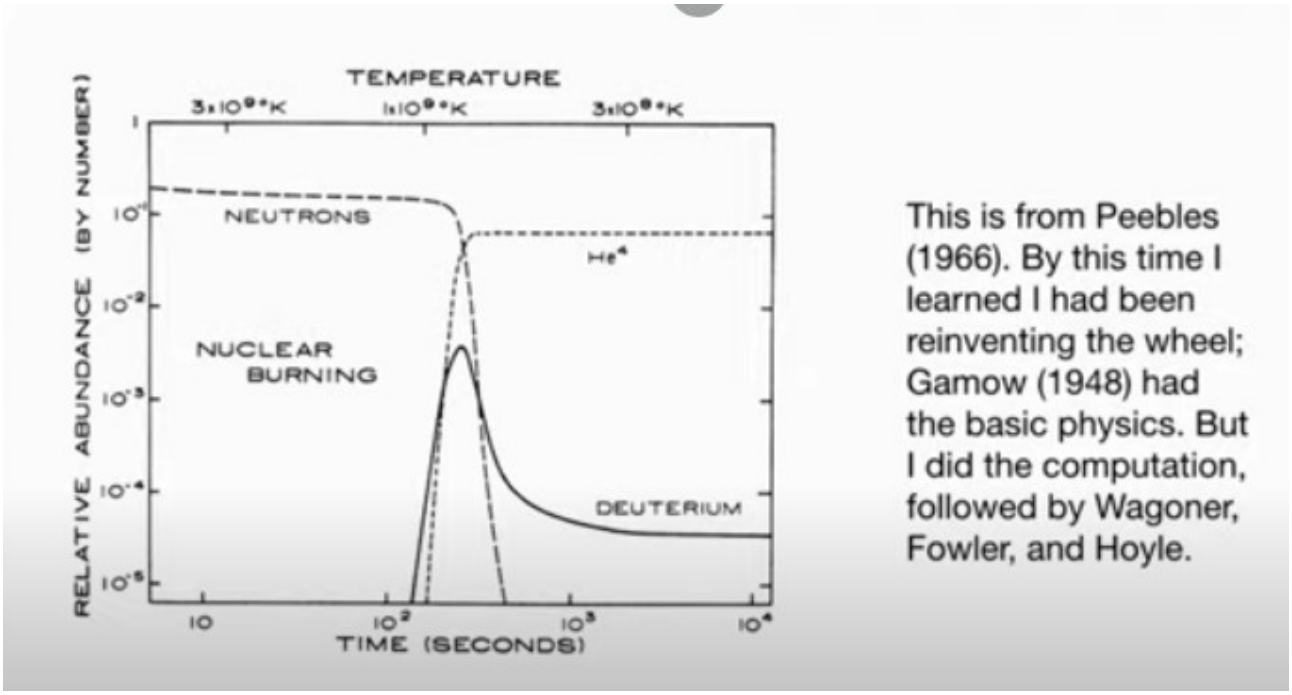
His presentation made with that occasion, was so pathetic, that I had to force myself to watch it up to the end; of course I watched his presentation these days and not in 2019.

For the future, his presentation has only a scarce historical relevance.

There are some nice groups photos which can help the future historians to understand the mafia behind the nobel prize nominations.

There is little science in his presentation but anyway, Mr. Peebles pointed out his most important discovery: he reinvented the wheel.

Here is a copy screen form his presentation:



Do not be so harsh with US academic crowd, because one has to take into consideration the historical context though! When Europeans invaded America, they have forgotten to take a wheel with them.

So, it is obvious that by reinventing the wheel, Mr Peebles stands out as a remarkable scientific personality and after that, with some strings pulling, the nobel prize was fraudulently attributed to him.

For those who have nothing important to do in their lives, here is his presentation:
https://www.nobelprize.org/prizes/physics/2019/peebles/lecture/

https://www.youtube.com/watch?v=cM3Fk4TUV58

For those really interested in this topic, I have to mention that other considerations regarding the 2019 noble prize for physics have been made in a previous newsletter entitled Dark Matter and Dark Imbecility – Section X.

Well, the same academic crowd think that because the precedent was created, it has been high time to transform it into a custom and 2020 nobel prize in physics was attributed for other imbecilities.

Maybe for this year, a crowd funding is going to be organized in order to pay some speech writers to support these later laureates with some more consistent presentations!

SECTION XI 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 lesseon 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 intelectual revolution, i.e. a change of the entire foundation of exact sciences.

This crowd is composed mainly by the present intelectual 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 would be sure they are not 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.

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.