

# Time

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## What Is The Time

We can define time as a process of comparison of flows of two processes.

We compare the flow of one process with the progress of another one. We may ask:"How often one process repeats while another one is still not ends.

To do the comparison we can use one process as standard(usually this is repeatable process) and compare with it the measured one.

As an analogy we can use the procedure of finding the length of the object.

We count how many times smaller object(measuring stick) "fits" in the measured one.

Then we "measure the time" we count how many times faster(shorter) process will "fits" in the bigger(longer) one.

Obviously, the shorter the standard process in accordance to the measured one - the more accurate result will be obtained.

Let's create hypothetical world.

World where only Drop Clock in use.

What is the construction of this clock? Here it is.

In reservoir, filled with water, in the bottom, there is a small hole of such size,that water don't flows threw this hole but drops.

Under reservoir, at some distance, there is thin metal sheet fixed only by

one side.

Then water drop hits the metal sheet, it is create strong noise.

Let's assume the observer compares the process of water dripping from this clock and the process of candle burning.

He is "measuring time":)

After he finish the counting how many drops of water fall while the candle was burning, he may say, for example:" Candle burned out in 1758 drops".

Or he will measure how fast the sportsmen run a mile.

He may say:"It's took 177 drops to run a mile".

Unusual to hear the word "drop" as measuring unit to judge a speed of the process.

But, since we now where is this from, we will say what such practice has rights to exist in such hypothetical world.

Where is a second, a minute, an hour , a day , a month, a year comes from?

In our real world we also start to compare one process to another in attempt to find the measuring unit which can be understood by any body around us.

In the beginning people live in small groups and did not now any measuring units, but Day.

All their primitive life was connected with light period of the day and dark period of the day.

At night, the danger was all around, so they hide in the caves.

As soon as the Sun arise, they now new day is coming.

So they count the days if they want to say about someones life, how long he has live.

At some point, because they believed that Moon was born and die, after this again and again born and dies, they start use this event as a measuring unit.

They start measure length of the human life not by days but Moons.

They may say:"My father was lived for 457 moons".

At some point they discovered that seasons repeated all the time, and it is connected with the Sun.

Moon always exists, but get in to the Earth shadow periodically.

Connecting together all this events(days,months,years) was not easy

task.

But it was done in the first primitive countries.

Even at the beginning it was believed that it is the Sun rotates around the Earth, this was not the obstacle to find the period by itself.

It was done in many ancient civilizations. It is called a Year.

The period of rotation of Moon around the Earth they called a Month.

They believed that there is 12 month in the year.

That how the lunar calendar was born.

Ancient astronomers make in different countries same experiment.

They count the days between two identical positions of the Sun in the skies during the year.

Was used such events as Fall or Spring Equinox.

In different places they got the same result which satisfies the needs of the people of that time.

The length of the Year was 365.25 days.

That's how the Sun calendar was born.

Since the life of the people connected more to the Sun than the Moon, this kind of calendar prevail and used in most countries to this days.

But where is a second, a minute, an hour came from?

The Sun Dial is the mother who give us this small fellas.

An ancient Egyptians, probably, was the first people who use such device.

They divide the dial from the dawn mark to the dusk mark by 12, and call each this part an Hour.

At summer time an Hour was long, at winter - short.

And only at the fall or spring Equinox such device was shown "real" Hours.

Some people divide the Hour by 60 and called each of this part a Minute.

After this they divided each minute by 60 and called it a Second.

Sun dial was good to see a minutes, but seconds was impossible to observe.

I believe someone, somewhere was must to invent the sun dial that use a mirror.

Mirror was placed on the high tower, for example.

The sunbeam from this mirror will move across the dial, and this dial located far from the mirror, so person can easily observe how the

sunbeam moves from one second mark to another.

Probably it was never invented at that time, people was satisfied with minutes.

Today it can be interesting attraction.

Sand dial was invented, water clock was invented.

But seconds was hard to count with such a tools.

And people just counted by own self!

Someone, someday find out that if you will repeat some phrase constantly while one minute sand clock runs, it may fit in this period very precise.

In different countries it will be different phrase.

In the USA it will be:"One thousand" plus the number counted.

For example the person start count:" One thousand one", "One thousand two", "One thousand three"....."One thousand twelve", and at this moment the process has ended.

This means that this process was flows for 12 seconds.

In medieval time was invented the mechanical clock.

Finally the chronometer and stopwatch was invented.

Atomic clock shake the human ability to imagine how accurate this machine can be.

But does not matter how accurate this tool can be, the idea is the same.

How many standard processes will fit in the measured one.

Now, after we are studied the history of expression "Time", we can say that time is a procedure, or description of procedure, or logical, numerical expression which can be use in logical operation to define the stages of some process.

You can't manipulate with time, can't create it or destroy it.

You can execute it or not(if time is a procedure), you can use this information in logical procedure or not(if time is a logical or numerical expression).

But even it is sound paradoxical, expressions like "time disappeared" or "time stopped", can reflect very real state of the matter in this world.

"Time don't exists" - if there is no material objects, no events, no processes, no time as a result of the absolute absence of the matter.

"Time disappeared" - if cool down all in this world to the absolute zero, when all events, but the fly of the frozen objects will stop.

And even the objects will still fly through the Universe, nothing material will be able to execute the Time, compares one events with another.

## **What is a second exactly?**

1. A Second is a logical definition, a description of a process or an event. An event (or process) has a beginning and an end.

We are living in the world of objects, and with these objects, there are events happening.

Events (processes) may also happen in virtual space, there is a rule that the material world appears as a logical model.

For example, a digital sum can be a virtual object.

Digital sums do not exist in the material world.

But some can be changed into a virtual process, some can become bigger or smaller, which means that we can observe this process and compare it with other processes.

This can happen in the real world or virtual world.

This is why I made this absolutely necessary intermission.

2. Let's make an example of such a process that is easy to create and observe.

We will use a process of the free-fall effect, in which the object is under the influence of the earth's gravity.

This is accompanied with normal air pressure, normal humidity and is at sea level.

Then: a Second - is a process which starts at the moment when an object begins to free fall from the height of 4905 millimeters.

This process ends when the object hits the ground .

We must take into account , however, that the material from which this object was made must be so dense that air resistance practically doesn't

affect the movements of free-falling.

If you drop a paper ball, it will fall far longer than a ball made from platinum or gold.

Seconds will have different lengths.

Depending on geographical location, seconds will also be different lengths, since the gravitational pull will vary in different locations.

3. Let's try a process so stable that it will not matter where we will make our calculations.

Let's use one period of rotation around the Sun.

A Second is  $1/31556926$  part of the full process of rotation of the Earth around the Sun.

We walk in the footsteps of our predecessors, who divided the year in 365.2422222 days, divided days into 24 hours, an hour into 60 minutes, and minutes into 60 seconds.

This is why there is 31556926 seconds in the year.

I must confess, actually, that I am trying to show the connection between the period of the Earth around the Sun and the process of changing the orientation of a clock's handle around the dial.

For hundreds of years people have checked how good the clocks would work by using a very simple method.

A certain moment has to come in which the Earth and the Sun are in a certain position (for example, the spring Equinox), so that the clock can start.

After a period of one year, the Earth stood in the same position (just like one year ago) the clock was checked to see what it showed.

By comparing which clocks showed one year ago and clocks that are showing the current time, people were able to find out how good their clocks worked.

4. Imagine, we made a clock with only one handle, and this handle makes 31556926 rotations while the Earth completes one rotation around the Sun.

According to this clock: a Second - is one rotation of the handle.

Let's create a clock with a handle which makes 60 times less revolutions than the previous clock's handle.

It will be 525949 handle revolutions while the Earth completes one revolution around the Sun.

Let's make a dial for this clock with 60 marks on it.

According to this clock: a Second - is a process of handle movements which begins when the tip of the handle on the one mark of the dial, and ends when the tip of the handle is on the next mark of the dial.

We just described what a Second is, by using a stopwatch :)

Also, according to this watch: a Minute - is a process of one revolution of this handle.

Well, you already understand what we invented again, clocks with seconds, minutes and hour handles. I will not to describe the whole process. You understand the idea.

When we create such mechanism, we are able to generate stable standard processes (handles change orientation according to dial), thus we do not need to use such inconvenient standard processes like the movement of objects in the skies.

The beginning, or ending of the day, burning candles, rooster crowing at night or at the morning, water or sand flowing from one bucket to another, and so on.

I think now you can figure out what is a minute, hour, week, or month

.....

I will give you a hint: there is 60 seconds in a minute :)

## **What Is The Past,Present,Future?**

By using the conception "event" we will define what is the Past,Present,Future.

I will use sometimes abbreviation PPF( Past,Present,Future ) in here.

Event is a process or array of the processes.

No event exists without beginning and the end.

Process and event starting up, flows and finally ends.

Even if we considering what event was momentary, this is just very short process.

Say,if nothing was changed, then event(process) never happened.

Let's define now what is PPF( Past,Present,Future).

Past - is the event(s) which already ended.

Present - is the event(s) which still flows( in process).

Future - is the event(s) which don't started yet( don't existed and don't exists).

Applying this definition of PPF and using only one standard process means to me the most rational( even we still have some trouble).

To find a such a process became the main factor in the attempt to build the logical explanation of PPF in every particular situation and this( principal event) must include inside all other events of same category.

What is happening if we will try to apply PPF conception to define all events in the Universe?

I think what is quite possible, because every thing that is happening in the Universe is a process(an event). So, let's try:

Past - is the absence of the Universe.

Present - is the existence(presence) of the Universe.

Future - is what happened after the Universe will disappears.

I am intentionally use only one Universe.

We will not to discuss here the question which no man can answer yet.

Some one think it's only one Universe exists.

Some one think endless quantity of Universes existed, exist at will exists.

But let's talk about our motherland.

Existence of the Earth is event. As up to day, this event still not ends.

We will try to use this event as an principal one in PPF conception.

Past - is absence of the Earth.

Present is existence of the Earth.

Future - is what happened after the Earth will disappears.

I found what question : "What is the Past,Present,Future ?", as a rule, appears usually when people talk, discusses the topic : " What is the Time? were is it from?".

In other words, when philosophical questions are in discussion.

And if you try to use an Universe in the attempt to explain PPF conception,you will get ton of questions.

In the real, every day life, people use PPF for approximation in the process of comparisons of different, very usual processes and events.

People do it easy and naturally, without much thinking, no philosophy :)

"In the past Friday I was at....."

“In the future century we will be able to.....”

“In the present day I don't have to.....”

If you will ask someone:” What is the Past?”, when most will answer something like this:“ This is what was happened day, month, year ago”. No one will say: “ This is what happened millisecond, second or one minute ago”. People look at that goes around from practical point of view , define events in such way what this definition will be easy to understand and use in the life.

From my prospective, the main problem is how to find the wright length of the Present in every particular situation.

For example, let's take a second as the interval.

Events which was happened one second ago or earlier will be the Past.

Events which will happened after the one second or latter will be the Future.

On the Present has left only two seconds.

But what we will do with events which started 3 seconds ago and still flows?

They will be in the Past, in the Present and in the Future at the same time.

What if we will use an interval of 1 millisecond? What if we will use an indefinitely small interval?

In this case we will have the Present in the form of “membrane” and will be able,with very high precision, separates events which started and ended before “membrane” and events which started after “membrane”.

First one will be in the Past, second one will be in the Future.

But “membrane” constantly moves to the Future, and this means that just was the future event,became the past event!

Not all events, because some of them has short period, some has very long period.

Events with short period flows from the Future to the Past faster when events which has longer period.

Events which started long ago and will not ends for long time will be in the Past, in the Present and in the Future at the same time.

Let's try to make a really big interval.

All what happened 100 years or earlier is the Past.

All what will happen 100 later and after this is the Future.

On the Present has left 200 years.

Unfortunately, even in this scenario, we can't, and never will be able to, get rid of the events which still be in the Past, Present and Future at the same time.

What will happen if we start to define PPF by using only one event?

I mean, length of this event, the length of the Present will be oriented only on this one event?

Hardly its help. Not for hole conception of PPF. It will work only for the Past, or only for the Present, or only for the Future and only in some cases.

Because we trying to approximate values to make exact comparison of processes.

Let's try each part of PPF independently.

"In the past it was saber tooth tigers!"

One millisecond ago? 100 hundred years ago? Million years ago?

No information...Clarification needed.

"In the present time I am studying German language."

Right now, while speaking to me? This semester? Today?

Hard to understand.

"In the future we will see flying cars!"

This evening? Next week? Next year?

Please, clarify!

Only when we use PPF with events, we can clearly understand and identify it.

"Last year I was weighting 111 kilograms."

Very nice definition. Because the person don't give us any details, we can make a conclusion, whole year he was weighting 111 kilograms.

"In the past and the present no country has send a man to the Mars."

No time interval shown, but we don't need it in this case. Everything understood.

"Next year we will live much better!"

And again in bullseye! We all understand what soon life will be much better.

Wait when this year will ends and: "Yahoooooo!"

It is became obvious, what conception of PPF mostly used only to approximate some frame of event(s), and can't be used independently for

precise comparison of events and processes.  
It is required to use with it such procedure as time,  
if we want to have an accurate events(processes) comparison.

## **Unusual role of candle in human history**

It is hard to believe, but for many hundreds, perhaps thousand years, candle was playing the role of the watches in many nations, countries of the world.

This was so simple and convenient clocks, that even kings and noble people use such device.

Poor people also love it, because it was cheap and simple.

In medieval, in Europe, it was impossible to images the city resident which don't have such luminary device in the house.

Sundial don't work at the evening or in the cloudy day, sand clock expansive and mechanical clock impossible to buy unless you are not a merchant or the noble man.

But how this candle watches was working?

Candle was made from such material, which has ability to burn out in stable rate.

The size of the candle was so big that candle can burn for long time.

Was candle able to burn a day two or even a week.

Cheap candle was made to burn out in six to twelve hours.

On the side of the candle there was marks(dial), so people can judge what time has passed from the some moment, what time it is now.

Big inconvenience for such candles was that they must be starts burning in some precise moment of the day.

For example: if candle has 24 marks on the dial, then highest mark on the candle was representing 6 at the morning, it was number 6.

User must wait until city clock starts beat 6 at the morning time, and at this very moment ignite the candle.

If he was late, oversleep for example, when he must cut-off the candle(shorten it) to the nearest available mark.

If he wakes up at 7:07 at the morning, he will cut-off to the mark 7:30 at the morning and when city clock starts to beat 7:30 he must ignite the candle.

All this was very inconvenient and eventually it was invented special candle holder with movable dial on the side. Why? This is why.

It's let to use cheap, short candles which don't have to have a dial or marks on the side of the candle anymore.

Man was just waiting then city clock will start to beat a time, any time.

He already put candle in the holder and ignite it. Candle is burning....

As soon as city clock start to beat , he just adjust the dial position by moving it up or down.

For example if it beats 11:30 and edge of the burning candle on the one level with mark 08:05 on the dial, he just move the dial dawn until mark 11:30 and the edge of the burning candle will be on the same level.

Kings, counts and other elements of noble society was still use candles able to burn for several days.

In the different rooms of the castle there was a special glassed boxes with such a candles inside.

So everyone can check at the moment if it is the time to see his highest, time for dinner, hunting or it is time to go to the church to pray with cardinal.

Candle serve well for long time on the ground, but they lost the battle on the sea.

How and why we will speak latter. For now it's all.

## **Water Clock**

Now it's the time to talk about the main culprit of the most mysterious misunderstanding in human history.

Misunderstanding what time is the object.

Most guilty of this is a water clock.

Sand dial played some role , but not so dramatic in comparison with water clock.

They affect the way of thinking of old philosophers really well, and play main role in the birth of the legend about existence of mysterious, invisible, non sensible substance - Time.

But first let's look at the construction of this conniving, hypnotizing watches:)

You already understand,figure out from the name of this device, what

water is play the main role in such machine.

Particularly, the ability of water to flow from the reservoir threw the hole of certain diameter with certain, relatively stable speed.

So in reservoir it was a water and it flows out, the level of the water in reservoir was going down.

By observing how this level was changing, people was able to judge what time has passed, what time is now, or just make measure how long some process must be executed.

In the Old Rome such device was used as timer to control for how long the man can speak to the public.

Water clock was started and flaming tribune open his mouth and pour out his speech.

As soon as all the water poured out of the reservoir someone tells to orator: "Cicero! Your time is flows out!"

As You can see, the mystical substance was given the characteristics of water.

Time can flow.

Even in reality it was the process of comparison of two processes (flows of the water and orators speech)

expression: "All time is flows out!" leads into delusional state many worthy man of that time.

If they use phrase: "All water is flows out!" then we are never have had such a problem with identification and right definition of Time.

The process of flows of water or sand, for some reason, bewitches the man.

Very often you can see the person who seats on the beach and slowly pours the sand or water from one palm to another.

We don't now why this is happening. But lets live this topic to the psychologists, lets them do their work.

We just agreed what this kind of human enigma do exists.

Another specific characteristic of human nature is the necessity to explain to own self and the others, how this world was made, what is the role of human in this life.

In other words, internal drive to explore own self and surrounding reality.

But, depending on the education level, man get in category of: "realists",

or in category of: “mythmaker”.

To get in the category of “realist” is very easy, but only in the present time.

We are using all sum of the knowledges what the people accumulated throughout the history of mankind.

And if someone will say: “The Earth is flat, you can see it with naked eye!”, we just will make an conclusion, what this person never was able to finish the fourth grade class. Or, he is a joker.

Well, this happens....

So we now that Earth not the center of the Universe.

Galileo Galilei and Giordano Bruno paid full price for this.

One get into the jail, in hands of inquisition, another one step into the fire.

All of this knowledges what we can use now was obtain by mankind in hard way, nothing was easy.

Because of our ancestors we can so easy now to get in to the category of realistic people.

So, let’s pay the respect to them, on their shoulders we are are standing.

Let’s try to look at surrounding us world and events what around us, threw their eyes, using the only knowledges what they have at that time.

We don’t have to go in to the caves.

Let’s look how was born and developed old Greek philosophy(mythology).

So, existing in the world of alive and non living objects, observing how the surrounding reality has changing, man was trying to understand the processes of life around him, build the logical explanation of events, interactions of objects, role of the human in this life.

We must talk again about specific constitution of human behave.

If the subject can’t understand, explain something, then he at the end, anyway will find something to satisfy own self.

He will explain everything with all his knowledges, even this will be very complex.

For example, to support the theory that Earth is the center of the Universe, the best mathematicians of that time create very original Cosmo system.

It was showing the trajectory of the Sun, the Earth and the other planets. The formulas support this system perfectly.

Even this formulas was tremendously complex, we must say, the theory was sounded really well.

If something was very hard to understand or explain, very few was able to stand aside and say:

"I know, what I know nothing".

Specific of human nature is to prove to own self and the others :

"I am smart!", "I am strong!", "I am practically never make a mistake!".

This position only helps to survive at dark ages of human history.

And this is why old Greeks judge surrounding reality from the position of vulgar materialism, their primitive knowledges of physical processes.

So, old Greek hears the thunder.

He can't see no one in the skies, but he can say for fact what thunder comes from the above, from the havens.

By using his life experience, he can say what this kind of very loud sound can be created by someone very strong. According to the sound this is not the human or any known animals.

Old Greek saw the lightning. Same story.

He made a conclusion: "In the skies, there is a creature, invisible and mighty, so strong, that it able to throw the fire arrows (lightnings) and make so loud thunder that everything is on Earth is shaking.

Greeks called this creature: "Zeus - god of the thunder, lightnings and heavens", and even this is was invisible god, Greeks made a statute of him, and people worship him.

Asking for mercy, ask not to fry people out in see or on the land with dead full, fiery lightnings.

Greek mythology explain all the events of this world from the position of existing of army of the different ranks of gods.

There was goddess Eos, goddess of dawn.

She opened the gates of the heaven for the Sun to rise.

Here we go, this is how the Sun get freedom every morning!

There was Chronos - god of Time. And at the same moment, he is the Time.

So, time is a person:)

We must say, what in many world religions you can find gods or goddess

operating with Time.

For example, eastern goddess Kali is the eternal Time, she is a Time which operates time, create it, guide it and finally destroy it.

She eats the time....Time eats the time...

So time is the person and the object(food) at the same instance! Clever!

But let's come back to our Greeks.

Their philosophy has great influence on practically all other ancient people.

This is why in the Rome they was use the same point of view on the surrounding reality, just like old Greeks do.

Remember about the gods, observing how the water flows in the water clocks, and how at the same moment then water is gone, the time is gone, old romans create a theory that time flows.

They found in this processes(one is invisible, it is does not matter, Zues also invisible) proof of idea about the time as invisible, flowing substance.

This is so obvious!

Just like the Earth is flat....

The Sun rotates around the Earth...

So, we know the specific of human nature, we know that at that time people don't have the elementary knowledge's about the physics and other disciplines about surrounding reality.

We know that this people use mythology to enplane world order and events which happening in the world.

We understand why long ago they thought what time is invisible object.

Why, at the present time, people who has an access to all world knowledge's, and able to see real order of this world and events, still in the mythology net, very hard to understand...

I hope, that most of the readers of this lines, are realistic, and agree with me.

Time - is a procedure or logical expression, which let to understand, find out or define in which state the object or event was, is or will be.

Time is not the object.

For those who still in the mythology net, I hope, that new information they found here, will help them to became realists.

Help to forget about time traveling, time holes, burrows, strings and

other even very original but proof less theories.  
Life will be easy and bright, trust me, in real world it is fun to live!

## **Sand Dial**

The role of the sand dial in the history of mankind is hard to overestimate.

The especially important role sand dials played was in the discoveries of new lands and continents.

Yes, yes... Most of these discoveries were made by sailors.

But sailors cannot orient in the ocean without watches.

They cannot determine their ships location or calculate the right course. Even after mechanical watches were invented, sand dials (also called by sailors “glasses”) were still in use.

It was a very simple and dependable tool, and storms or the ships movements did not affect them as much, contrary to mechanical clocks.

This is the reason which led them to win the battle on the ocean.

But why did sailors call these sand dials “glasses”?

To answer this question we must look closely at the sand dial's construction.

This kind of clock contains two cone shaped glass containers connected with each other by their tops.

Between containers was made a small connecting round hole.

Before the two containers were connected together, one of the containers was filled with very clean sand.

Very fine, filtered by granule size sand.

This kind of sand had the ability to flow through the small connecting hole with relatively stable speed.

This ability was used to define the rate of time.

Let say we have a sand dial for measuring a period of time of 12 hours.

The glass containers had marks(dials) on the sides.

By observing these marks and comparing the sand level with these marks a sailor could understand that time it was, how much time has pass from

the start of another event ,and could also predict how much time was left for an event, or how soon an event would happen.

In the beginning all the sand was in the lower container. The sand dials were not working.

The navigator, by observing the Sun, declares that it was 12 noon.

He gave the command to the sailor :” Turn the glasses!”.

The container filled with sand was now on the top and the sand started to flow to the bottom container.

Every 30 minutes the sailor tall the bell.

This is where the expression:”beat the glasses”came from.

Sailors had their own code system to recognize the combination of sounds produced by the bell.

They were able to understand what the melodies meant in relationship to time.

Very often small glasses were used to find what the speed of the ship was in a given moment.

This kind of clock was able to measure one minute, with very good accuracy.

We cannot say the same, however, when we speak about the big sand dials.

This is why, even if it was inconvenient, sailors would run a combination of many small sand dials instead of one big clock.

Finally, the chronometer, a very fine mechanical clock, was invented.

Even a big storm had no effect on this incredible mechanism.

This kind of tool cost almost a fortune, and a navigator keep it in special “treasure” box.

Once a day, the navigator take this diamond in his hands and give commands to start the sand dials on the ship.

The sailors life was steel under the rules of “glasses”.

Just like you have already figured out, sand dials were called “glasses” because they were made from glass.

On the land sand dials were also very popular.

Sun dials depended on the weather and the time of the day.

In the evenings and at night they simply didn’t work. Inside the home sun dials were inconvenient to use.

Fog, snow, or rain stopped these clocks immediately.

This is why so many people preferred to use sand dials.

Sand clocks were especially convenient to measure relatively short intervals.

If someone was in a library, he would pay the toll and could read a book while the sand flowed down.

In the libraries a sand dial was in use! In the kitchens it was in use!

Gross masters used these glasses!

In the boxing tournaments small sand watches (1 minute, 2 minutes, 3 minutes) were used for centuries, and still are in use in many places!

All the sand has dropped down? Hit the gong: "Relax boys! Breathe deep!"

One minute has passed? Break other, hit the gong again: "Jump up! The public is waiting!" :)

As you can see, the sand dial played a tremendous role in human history.

Even nowadays many people still love this kind of clock.

Some magic exists in this shiny tool, some gravity.

Many people like to watch how slowly, but surely, time "flows".

## **Town Clock**

We know that in medieval times many people used a sand dial clock or a candle clock.

Both of these watches required to be started at a certain moment, or had to be corrected at a certain time.

For a very long time it was a moment when the Sun appeared on the horizon, or when the Sun reached its highest position of the day in the sky (noon).

For thousands of years this was the method.

Different people started their watches in different instances, made mistakes, and as a result had different times on different watches.

Therefore, it was very difficult to plan a meeting and be on time.

People were always too early or too late : (

Due to this inconvenience the town clock came to the scene.

This clock had four dials oriented to four different directions.

Every town resident was now able to see the correct time.

The hands and dials were made a tremendous size.

But what do you do if it is too dark outside to see? What if it is snowing?  
Rain?

What if there is fog, or your home is too far away from the town clock  
and you do not have a spyglass?

All genius solutions are simple. Our predecessors used bells in the town  
clock.

At a certain time of the day the clock played(tall) certain sound  
combination.

People could hear what time it was now!

All the events in this town were oriented and executed with the help of  
this magical machine.

Residents were able to start or correct their watches with help of the  
town clock.

From this moment it was not very important anymore if the town clock  
would run a little bit slow or a little bit fast.

Most importantly, the town clocks became standard watches for all other  
watches in this town.

It was a revolution.

In medieval times the idea to synchronize many different processes with  
one standard process was born.

The town clock played the main role in this masterpiece.

## **Comparison of events and processes (TIME)**

Time is a procedure of comparison of processes (events). One process is  
standard.

Another process is playing the role of measurement.

The absolute necessity for a standard process is to have at least one  
parameter which changes or to have periodic events, or cycles.

A measured process, it may sound strange, may even be, the absence of a  
process itself.

No changes, or no events we can call it an "anti-process".

But since we are living in a material world, we will not discuss this, and we will call it a process.

There are more than enough of these processes (absence of process formally) in this world.

What was a process - movement, became a process of stillness.

We can compare both with a standard process.

For example, we can see a result of the comparison of processes of

1) the rotation of the Earth around its own axis (standard process) with the process of

2) an existing object (a stone that lays on the ground).

So, while the Earth rotates 3 times around its own axis, the object (stone) does not change it's coordinates.

The object's orientation still exists (stone still lays on the ground at the same position).

Let's use another example: A moving object.

While the Earth makes 12 rotations around its own axis, a ship sails to New-York from Saint Petersburg.

While the Earth makes 6 rotations around the Sun, Afanasy Nikitin (the first European to write a book about his travels to India) made his journey beyond three seas.

I intentionally did not use the words Day and Year.

A day means the Earth has completed one full rotation around its axis.

A year means that the Earth has completed one full rotation around the Sun.

From ancient times, man has used these two expressions (Day, Year), and at some point started to treat these expressions as a measure of a mysterious object called time.

But you already know that not to be true.

This was a label of two processes,

1) the rotation of the Earth around its own axis, and

2) the rotation of the Earth around the Sun.

Time is the procedure, like we discussed earlier.

Not the object, not the field, not the mythological sub material substance.

Just a procedure or a logical expression (information).

We can use a standard process for something very routine (dawn for

example), and it is easy to transfer the comparison result to numerical value.

You have seen dawn 3 times - this means 3 days has passed.

Very convenient, no complicated calculations, no conversions.

What about an atomic clock for example?

With this type of clock the standard process is billion cycles per second. So we are forced to convert the result of the calculation of these cycles and use this very new result in another process which now becomes a new standard process for an observer.

This is the process of changing images on the screen (a virtual process).

For example: there is an image of the number 1 on the screen, then it changes to an image of the number 2 on the screen.

I am intentionally describing this procedure from this point of view so we can see how the mechanical process is connected with the virtual process.

We can't find any mystical substance (time) then we observe this process.

We get all that we need and we don't need anything behind it.

The observer now compares the process of changing images with a measured process.

The idea is the same - comparing processes with each other. This is a procedure...

If we use a mechanical clock, the observer compares the process of the handle changing position with a measured process.

How did it happen?

We just didn't count the cycles of the pendulum!

We started observing the more convenient standard process - the process of the movement of the handle.

The dial helps to connect the handle position with the numerical value.

Many types of clocks exist in the world. The Chinese, from ancient times, used a candle as a clock.

How can we use this incredible invention?

For example, you want to read a book before going to sleep and you are far away from everybody, deep in the forest. You do not want to use a flashlight because it is for emergencies only.

Use the candle!

The process of the changing of the candle length while it is burning out will be used as a standard process in this case. We will mark the candle. When the fire gets to these marks we will know that 15 minutes has passed (for example).

In fact a standard process that has ended, can by itself, be a way of information.

For example, a candle of certain length will burn completely within 20 minutes.

It burns out = enough of reading, it's time to sleep.

So, as you can see, if we want to have an idea of how a process is going, we must compare this process with another process (a standard one).

This is the only way to understand and analyze processes and events around and within.

By observing them and comparing them.

We do not have to find and catch that mythological substance - Time.

We just use a procedure, that someone, a long time ago named - Time.

## **Time And Numbers**

Let's, in the beginning, give a definition of - what is time .

Time - is the numerical or logical expression which is a result of comparison of processes, or numerical (logical) expression which is used in logical operation to find out how (then) process has started or will start, how(then) it flows or was flown, how(then) it will start or how(when) it will end or has ended.

Usually, one process plays the role of the standard and the other process plays the role of the measured one.

For example, the rotation of a clock's handle around its dial will be the standard process.

The object's movements from one point to another one will be the measured process.

The result of comparison of these two processes will be numerical expression.

The observer will make logical operation, subtract one number from

another and have the numerical result.

Here is another situation:

We have a logic plan (graph) which connects the position of the clock handles with the phases of the process.

For example, the table will show, for the specific date and time, when the Sun will “rise” above the horizon, and when it will “fall down”.

A person will use this clock and this table to find out all this information about this process and won't have to care if it will be night or day, snow or rain.

And will not have to go outside to see where the Sun is. :)

So, by comparing numbers with numbers, we can find out which process in the progress right now, how it flows, when it will start and when it will end.

Let's make another definition of Time.

**Time - is the logical or numerical expression, the result or comparison of a standard process with a defined one, used in the logical procedure to find out when defining how a process starts, in which state it is right now and when it will end.**

**Or, Time - is a numerical or logical expression used in a logical operation to find out when a defining process starts or has started, in which state it is now or will be, when it ended or when it will end.**

## **Is Time Travel Possible?**

Is it possible to travel in time? To answer this question, you must first determine what time is.

Time - this is the procedure comparison of the two processes.

One process is the reference, and the other is measured.

If the standard process was adopted by cyclical process, then it can be an analog to length measurement procedure.

This counts how many times a reference object fits in the measured.

The result is a numeric expression.

When the time ( time - the procedure ) counts how many times reference process will cycle, while the process is being measured.

The result will be the figure.

But this is only one way to compare, when, as a standard cyclic process.

You can use and sustained process (moving in a straight line or a complex trajectory), and the chemical (oxidation reaction (burning candles)) and other processes.

But the idea is the same.

The procedure TIME is a comparison of two processes, one in the reference, and the other in the role being measured.

Many believe that time is an object, not a procedure.

This confusion arises because for people it is more comfortable to ask: "How much time?"

Than to ask: "How many times has the pendulum swung since its launch at midnight?"

Therefore, the creators of the clock always went from awkward descriptions and evaluations of events to simple and understandable ones.

The dial was used since the invention of the sundial.

To dial was tied reference event, does not matter, how different this events may be.

Even candles were used as clocks, and they have a marked dial on their sides.

By linking the digital value with the word TIME, people used to think that time is an object.

But no one believes that weighing, for example, is an object.

If you will have such a practice, that will be asked about the results of measuring weight; "Weigh?". And receive the answer: "100 kilos," then there is the same resulting confusion as with time.

Procedure is credited with weight (characteristic of the object).

We live in a world of objects and events in a three-dimensional world.

Time, as an object, does not exist, and exists as a procedure of comparing phenomena, events, and processes.

So, in our world, the event occurred.

We will say that this event occurs with a simple object and this is about

the change of this (object's) position in space.

A certain object changes its position.

Let's say that the object is a teaspoon.

It was in the cup, and now it lies on the table.

You can repeat this event? It is impossible, because there is no spoon in the cup.

To repeat this event it becomes a necessity for the action of returning the spoon into the cup.

If such an event occurred, everything will look like the moment before the first event.

It would be the same position and the same coordinates.

But if you start counting the event, it appears that this is event # 2.

The spoon was in a cup, then was placed onto the table - Event # 1.

If now again we will put the spoon on the table, it will be an event # 3.

Each event has an end. It happened, and it can not return.

Any event, even with exact same physical parameters, will be a new event with respect to what took place before.

Therefore, the following event will follow the previous one, it will not be the previous or parallel (current) event.

To make it easier to understand, we must admit that in our material world the object can not exist simultaneously in different locations.

It is a moving object going from one point to another.

But, let's say that travel back in time is possible.

After analyzing this possibility, we find it impractical and senseless.

Let's say you're back in 2000. Obviously, you will be what you were this year.

You will know and remember only what you knew and remembered in 2000.

If, however, you will know and remember what happened after 2000, it will be not you, because you was a different person in the year 2000.

You can recreate the objects and events that have already disappeared with time and have already been done.

But it will be a different world, a world very similar to the one that came before him and disappeared.

As the last argument we will use the theory of the expanding universe.

In order to accurately recreate a vanished world it is necessary to compress the universe until universe has a size which it had at the time of the existence of this vanished world. :)

Who is able to do this action ?!