

## **Times..., scales of time**

Written by Administrator

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I am in progress of writing an article about the storage of spent nuclear fuel. Nuclear fuel needs to be stored for very long time until radioactivity has decayed to natural levels. Just looking at the problem you start to think about time. Quite obviously there are different time frames, and also quite obviously they matter a lot.

## **Geologic time**

I started thinking about geologic time when reading about the buttes in the Arco desert of Idaho and read that they existed in pretty much the same shape for 600 000 years. Now, these buttes are not very impressive, but withstood the teeth of erosion for a much longer time than our civilisation has existed, even if a few of our ancestors may have been around at that time.

In geologic time 600 000 years is not very long. The snake river valley was formed by a series of gigantic volcanic eruptions with perhaps two million years in between, for perhaps 12 million years.

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## **Glacial periods**

Glacial periods occur with semi-regular intervals. In geological time it's only a short interval. In

Sweden, where I happen to live, essentially all forms of animal life ceased to exist during the latest major glacial period. Little of our civilisation will remind of us being here after the next one.

## Human civilisation

Human civilisation may be defined, by me, with the period of time of which we have records, essentially writings, paintings and so on. The oldest civilisations we are aware of, like the Sumerian civilisation, are perhaps 6000 years old. We know about human life in Europe and Africa before that period but probably not what we would call a civilisation.

The Hellenic (Greek) civilisation was fundamental to what we know as ours. Parts of the Greek tradition were kept in the Roman Empire. The Roman Empire established many of the principles of a modern (western) state. Western civilisation dominates the world right now, but we need to keep in mind that of all civilisations ours is in no way the most long standing Chinese history goes longer back in time and has a great influence of that region.

## The technological revolution changed world as we know it, a real upheaval

Technology changed our world, as we know it, this development was going on for a long time but accelerated rapidly. I cannot say if it went on for 200, 300 or 500 years. It made world another, and probably better, place to live. If we call this the age of technology it has been much shorter than anything we discussed before.

Technological revolution changed the world so:

- **We have cities supporting millions of inhabitants living under good hygienic conditions.**

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- **Planet earth supports 6 billions (6  $10^9$ ) people of whom at least 85% are not starving.**

A side note to these observations is that standard of living in Europe 200 years ago was quite comparable to that of the very poorest parts of the world. Life expectancy in Europe and Japan was about 40 years around 1800 a.d., and average income may have been around 90% of average income in Africa today. Another way to see it is that this was a period of small populations but big families. The only way population could stay small was that the vast majority of young people perished before achieving reproduction. It takes about two children per family to sustain a constant population.

Check on this video: <http://www.gapminder.org/videos/200-years-that-changed-the-world/>

## Human generations

The life expectancy for a human born today in western world may be around 80 years, possibly longer (or shorter depending on habits). Humans normally reproduce at 15-40 years of age. Western civilisation puts emphasis on a longer cycle. It may be natural that humans see time on a life scale (like 80 years) or a generation time (like 20 years).

## Political time scale

The democratic system in the US makes it quite obvious that there is a political time scale. The reasons that the US makes this so obvious are mainly twofold:

- Strong presidential power

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- Presidency limited to two periods

This defines an eight year cycle in US-politics. The focus of the first period of presidency is to be reelected. Focus will be on domestic issues and emphasis will be on issues that will win support.

The second period is the time for presidency to establish a footprint in history. This is the time for defining doctrines and achieving

"peace for galilee".

## **Economic time scale**

Economy, like politics, may not really be appreciated but is a quite formative aspect of our existence. There are different cycles in economy. Conjecture cycles, buying habits and so on.

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