

**Review: Dr. Werner Gitt, *Time and Eternity*, Christliche Literatur-  
Verbreitung, Bielefeld, Germany, 2001**

Pages: 144

**Unique and Outlook-Changing Read**

As part of the Creation and therefore a gift from God, time is often taken for granted and not valued highly enough. The author draws attention to this by applying a five-level system borrowed from information theory.

Fascinating properties and measurement history are researched, from astronomical observation to the modern Caesium-133 'fountain' clock. Chapter one is heavy-going but well worth it to give an understanding of the subject matter.

Time has basic attributes-no storage, lending, interest-earning, or skipping capability (e.g. time machines, suspended animation, cryogenics,etc.). Like entropy it moves inexorably in one direction (the 'arrow of time').

Five sequential levels are explained for optimising usage:

\*Statistics-each person has the same quantity in a 24-hr day to utilise.

\*Syntax-there is an immutable 7-day week designed for man. This was tested by Napoleon's failed tri-decade, anti-christian Republican calendar (1793-1806).

Even 'secular' rules exist:

- Attempt unpleasant tasks first.
- Focus on a single task at a time.
- Avoid working without a plan, also confirm progress against it nightly.
- Steer conversations and come well prepared with an agenda.
- Give up perfectionism.
- Delegate where possible.
- Avoid simultaneity.
- Don't chase omniscience.

\*Semantics—good, evil or neutral thoughts determine meaning.

\*Pragmatics – time is consumed by good, evil, or neutral actions.

\*Apobetics – successful outcomes are always aligned with God's plan and here time seems to lose meaning. A disastrous outcome is a life lived apart from Him (e.g. vanity of the rich and famous). Longevity and good apobetics are not necessarily related.

Appreciating God's perspective of time is shown by way of an excellent analogy: the ability to instantly transport to a vantage point equal to the number of light years elapsed from a past event (up to the creation of the universe).

This study of time should change how a Christian appreciates their short allotment in this transient life of 'the severest master' .

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### I) Time-a physical quantity (pp. 13-32)

All physical units can be derived from one of seven fundamental quantities, including time. As an aside, interrelatedness can be demonstrated by simple combination of their constituents, e.g.:

Velocity (V) = Distance (D) / Time (s), which is in  $m*s^{-1}$ .

Force (F) =M \* A

Mass (M) is in kg and acceleration (A) in  $m*s^{-1}*s^{-1}$ , therefore the units of F are  $kg*m*s^{-1}*s^{-1}$ , or the Newton (N) (after its discoverer Isaac Newton).

Work (W) = Energy (E) = F\* Distance (D), which is called the Joule (after James Prescott Joule). Energy is also defined as Watt (W)\* $s^{-1}$ . Mechanical and electrical energy are joined by  $J=W*s^{-1}=Nm$ .

Time is measured arbitrarily by the second (s) which in the past was defined as 1/86,400th of a mean solar day. The problem arose that the

average solar day is not a constant duration.

A repeatable and independent measure was needed, which became the period of counting 9,192,631,770 oscillations of radiation of a Cesium-133 atom as it moves between two energy states (due to external forces). Cesium is not radioactive, melts at  $28^{\circ}$  and boils at  $690^{\circ}$ .

A cesium clock was created to make such a calculation. It works by passing a beam of these atoms through a magnetic field which causes them to enter either a high or low energy state. Then exposed to microwaves in a resonator, atom energy states are switched which either absorbs or releases electromagnetic waves (at the natural frequency above). Thus a reliable oscillation measurement has been instrumentalised.

The Relative Uncertainty (RE) is  $1.6 \times 10^{-14}$ s, or 1 second out from an ideal clock every two million years. The new CSF1 (Cesium Fountain Clock 1) has an RE of  $1.6 \times 10^{-14}$ s or 1 second every 10 million years.

It works by using lasers to super-cool the cesium atoms to nearly absolute 0K ( $-273.15^{\circ}\text{C}$ ), at which temperature their velocity is only mm/s. Changing the phase of the light causes atoms to 'leap' up at 4m/s and fall down under gravity (thus the name 'fountain').

During this time they are exposed to microwaves and their pre-programmed energy state is changed, emitting the electromagnetic radiation enabled the second to be measured. The longer radiation exposure time yields the accuracy increase over older generation cesium clocks.

By the distance equation, time measurement is linked to life and death at sea with the 18<sup>th</sup> C drive to measure longitude. Before, the ships would sail close to shore to avoid getting lost. Constant measurement of speed and time were crucial. The 1717 Longitude Act in Britain brought about a solution by offering a large prize which John Harrison eventually claimed.

Today GPS consists of 24 satellites which orbit the earth, 4 in unison on 6 orbital paths sending location data to receivers on earth. Difference in transmission times determines position.

## Physical time constants:

\*Shortest time span is the half-life of the  $^5\text{He}$  isotope ( $2 \times 10^{-21}\text{s}$ ).

\*Longest is the age of the universe.

\* $^{235}\text{U}$  half life is 700M years.

\*Oscillation period of pendulums [given by  $2\pi\sqrt{L/g}$ ]. 20M pendulum is  $\sim 9\text{s}$ , 1m  $\sim 2\text{s}$ .

\*Oscillation period of the note A is 440Hz, or  $2\frac{1}{4}\text{ms}$ .

Oscillation period of light with wavelength  $\lambda=540\text{nm}$  (green light) =  $1.8 \times 10^{-15}\text{s}$  ( $540 \times 10^{-9}\text{m} / 299,792,458\text{m} \cdot \text{s}^{-1}$ ). Thus green light is 5,000 times shorter than cesium-133 radiation oscillation [ $1.8 \times 10^{-15}\text{s} / (1/9,919,631,770)$ ].

## Astronomical oscillations:

\*1 'sidereal' day on earth = 23hr 56 min 4.09s.

\*1 Mercury year = 88 Earth days.

\*1 Mercury day = 58.646 Earth days.

\*1 Jupiter year = 11.862 Earth years.

\*1 Jupiter day = 9hr 50 min 30s (fastest axial rotation in the solar system).

## Biological oscillations:

\*Man lives 70 times as long as the shrew, and 1,200 times as long as the fly. The fly's eyes can react in  $1/100^{\text{th}}$  of a second vs  $1/10^{\text{th}}$  for man.

\*The shrew experiences several days within 24 hrs with  $\sim 1,000$  bpm (an elephant has 30, whale only 15). Elephants live  $\sim 30$  times longer than shrews which is  $\sim$  equal to their bpm ratios.

\*Birds can distinguish individual tones by intervals  $< 2\text{ms}$ .

\*Vertebrates average 1 breath per 3.9 heartbeats and all long-lived creatures total  $\sim 800\text{M}$  heartbeats.

\*Heartbeat and metabolism are positively correlated, and both are inversely correlated with body size.

\*During childhood a day passes slowly due to high metabolism and heartbeat (~70bpms) – like the shrew one day is divided into more than one. As the child grows (body size increases), heart rate and metabolism slows which lengthens out the day.

Time's arrow is only one way, from past to future, proven by the Second Law of Thermodynamics (entropy increases to a maximum in a closed system, such as the universe).

Time is related to a clock's speed, as proven by Albert Einstein<sup>1</sup>. As a test, a cesium clock traveling at 1,000km/hr for 15 hrs was  $4.7 \cdot 10^{-8}$ s slower than a stationary one on earth. This *dilatatio* (delay) is insignificant for man, but at light speed is great.

## II) Time-an anthropological quantity (pp. 33-103)

There are two types of time: χρόνος (man's) and καιρός (God's). Time for man is allotted, the severest master and is one-dimensional. It has a number of attributes:

\**Ceteris paribus*, can be shortened or lengthened based on one's actions.

\*Cannot be stored. Unused time is forever lost!

\*Cannot be skipped (e.g. time machine, suspended animation technologies and cryogenics for the deceased (a frozen body [-196°C] has blood replaced with anti-freeze, however a soul cannot be frozen!).

\*All activity requires consumption of time (except Jesus' miracles). E.g. in one second the bone marrow produces 2.4M RBCs, and 4B signals are sent across a brain's hemisphere.

\*Does not accrue any interest.

\*Cannot be lent to another individual.

\*All have the same allotment in an arbitrary period of life (e.g. one day). It is as if all were strapped to a large conveyor belt inexorably moving along.

\*Flows only in one direction.

The present has nil duration, and our life is the sum-total of a linear movement through space.

Theoretically, one could be an eye-witness to past events (even the creation of the universe) from a vantage point equal to the number of light years away as the event occurred in the past (e.g. a planet 6,000 light year's away). This simple thought can be expanded to appreciate God's view point of *kairos*.

From scripture, we see God has made no allowance for translation between his time and ours, e.g. one day (man) = 1,000 years (God), and 1,000 years (God) = one day (man). These are frustratingly impossible to reconcile!

To set the foundation of the author's theory of time, his natural laws of information are introduced:

\*Statistical: bits, including random processes.

\*Syntax: symbols.

\*Semantics: meaning or interpretation.

\*Pragmatics: drive from understanding to an action.

\*Apobetics: sender's desired outcome from the receiver has taken place.

All five levels assume a sender exists.

Statistically time can be measured very precisely but measurement alone does not convey any meaning. The original measuring devices given were the heavenly bodies by God. The brevity of time stands out.

Syntactically the seven-day week is understood to be the correct program time follows for man. As to the breakup of the day into smaller periods, the Babylonian hexadecimal system of seconds and minutes is entirely arbitrary. The seven-day week is accepted by science given an attempt under Napoleon from 1793-1806 to move to a ten-day week, and twelve 30-day months named after the farming calendar. It was an attempt to

destroy Christianity.

A number of secular time management rules also exist, including:

- \*Attempt unpleasant tasks first.
- \*Focus on a single task at a time.
- \*Avoid working without a plan, also confirm progress against it nightly.
- \*Steer conversations and come well prepared with an agenda.
- \*Give up perfectionism.
- \*Delegate where possible.
- \*Avoid simultaneity.
- \*Don't seek omniscience.

Semantics of time (S) means its thought content or meaning:

$S > 0$  = positive content

$S < 0$  = negative or wasteful content

$S = 0$  = no thought content (e.g. autonomous action).

Pragmatics of time (P) mean its actions:

$P > 0$  = Doing good. Quantity of time loses meaning in this state.

$P < 0$  = Doing evil, which will be burnt up at the judgment.

$P =$  Doing nothing - this time is irretrievably lost. Television costs time!

Surrender to an electronic society has the insidious effect of removing the ability to read and write, as well as blurring the boundary between child and adulthood.

Apobetics of time means the end result of our actions. There is a stark difference between good intention and a concrete goal.

Length of time lived and apobetics are not necessarily positively correlated, "he who sees the eternal is no longer attached to the transitory".

In rare cases, when we find someone who shares our beliefs time seems to fly and it seems as if a good outcome has occurred.

The ultimate goal is entering heaven to receive the prize.

### III) What is eternity (pp. 105-148)

Cessation of the conveyor belt restriction into God's realm. Clearly God Himself could never be subject to time as He would be on the conveyor belt with mankind.

Different cultures had diverse ideas of what awaited in eternity:

\*Egyptian mummification (up to 300AD). Internal organs (except the heart) were placed into a *canopic* for preservation. If the heart inside the empty shell was judged heavier than a feather it would be devoured by carnivorous deities. Tomb descriptions have shown 365 servants as in the afterlife each would only have to work one day per year!

\*"Happy hunting grounds" of the American Indians. Life was dependent upon animal availability so this was projected into that culture's afterlife.

\*Buddhist Nirvana of complete oblivion after earthly extinction. It is conjectured one soul escapes the cycle of life every thousand years.

\*Islamic Jannah which is male-centric and unfettered indulgence of the senses.

\*Atheist/agnostics also have a sense of eternity as found in various forms of art.

For the Christian eternity is being in God's presence:

\*It is a place of beauty. In the physical women especially desire this-an undying industry exists to provide beauty-preserving products, also it is said every beautiful woman dies twice and female TV personalities careers' die at forty. The Empress of Austria refused to have her portrait painted after age thirty<sup>2</sup>!

\*Scarcity will not exist, improvements are impossible and boredom is unknown.

\*An experience of simultaneity where each will have an assigned task but without political machinations!



\*There is no sin.

\*A new name is received, on a white stone. In antiquity such stones were used as personalised invitations, sporting achievements, and for signifying acquittal after a trial (a black stone denoted guilty). Worldly rulers have sought out names for themselves due to pride, e.g. Octavian took a title 'Augustus' after becoming Caesar, which means 'majestic one', Carolus Magnus (Charlemagne), Frederick the Great, etc.

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<sup>1</sup>This is known as his theory of *special* relativity, as opposed to his theory of *general* relativity, which explains how time varies with gravity. There are two additional hypothesised theories that affect time: John Hartnett's Carmellian physics involving a 5<sup>th</sup> dimension (i.e., the velocity of space's expansion), and Russell Humphrey's 'timeless zone' where inside a gravity well space-time becomes space-space and time ceases to exist – this is thought to be the case (from earth's vantage point) before day four of the universe ended to give enough time (by non-earth clocks) for light from all other objects to have traveled to earth.

<sup>2</sup>Such vanity is noticeable on social media sites, ID cards, etc. which people do not update on purpose to maintain a facade of youth.