

TIME AS A FUNDAMENTAL REALITY

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Preface

This book offers a serious effort to penetrate deeper into the reality of Time and into the relationship between Space and Time. The contradiction between Stefan Klein's book 'Time' on the one hand, and Carlo Rovelli's book 'Mystery of Time' on the other hand prompted me to write 'Time as a fundamental reality'. In 2006 Klein wrote a very interesting book about a phenomenon, about which Rovelli maintained in 2018 that it does not even exist.

We live in a world of Time and Space. The familiar space is composed of the three known measurable dimension: width, length, and height either left-right, bottom-up, and front-back. This is stating the obvious, of course. But as far as Time is concerned, things are quite different and far from obvious. Some even speak of the mystery of Time. Others, like Albert Einstein in his theory of relativity believe that Time is only an illusion and has no reality in itself. Over the centuries, some people have thought deeply about Time or have occupied themselves intensively with it. We will therefore quote a few of them in this book. Time is just as fundamental an issue as Space and therefore equally important.

However, time is not an issue for most people. They are familiar with the clock on the wall, on their wrist or on their mobile phone and never give it a thought. The prevailing idea of Time is a consequence of the impressive developments in physics of the last few centuries. This simplistic idea of Time does not do justice to reality and has been dominant for too long, and therefore needs to be revised. Joke Hermsen¹ writes in 2009: "*we are faced with the task of reinterpreting Time*". My book describes a serious attempt at just such a reinterpretation. Its urgency is growing. For decades now people have been experiencing an ever-increasing pressure of time. Rosanne Herzberger² puts it bluntly in regards to The Netherlands: "*this country longs for time*". But the causes of that increase in time pressure hide in the dark. After living in China for 15 years Christine Cayol³ wrote in her book 2017: "*If we want to find a new way of living, we must stop believing that there is only one kind of time, the one that is instrumental to the race to action. It is about making a distinction between different kinds of time, all according to the nature of various activities.*" And: "*Time and Space are connected, at least to us mortals, and we make the most decisive choices in the heart of this subtle connection. Are we inclined to either Space or Time? Do we give priority to the race against the clock or do we go for deepening our understanding of Time? Impatience or attention? (with reference to Abraham Herschel:)* "*We cannot conquer Time through Space. It is only in Time can we hold sway over Time.*" And: "*We do well to take a critical look at our rhythm, pause occasionally: from a single time to a multiple time.*" We would like to support this thinking and come up with a concrete proposal in this book.

Physics, with the theory of relativity as a highlight, contributed greatly to the current image of Time. But it is precisely that theory which unmistakably shows the tunnel vision of the physicist and uses a distorted view of Time. Time is not relative to Space, but flows always and absolutely forward to the future and works as a rhythmically moving polarity. This at least indicates the

¹ Ref. her book in Dutch 'Stil de tijd' page 61.

² Ref. the article in the Dutch newspaper NRC of 22-9-2018 'Niks koopkracht, dit land snakt vooral naar tijd'

³ See the book 'Waarom de Chinezen de Tijd mee hebben' pages 36 and 248

Time as a fundamental reality

need to limit the theory of relativity. I hope and expect that such a reflection and limitation will contribute to a more harmonious relationship between the bêta sciences and the other scientific fields.

In recent years several interesting books have been published on the subject of Time, which in many cases describe a wide range of aspects and appearances of Time. Often with an exploratory, inventory and / or historical character perspective. This book, however, is somewhat different, namely a description of the fundamental structure of Time and of what that means in relation to Space. Just like Space, Time is also a composite reality with an internal structure. With the proviso that Space is a relative reality and Time is an absolute reality. Time never comes back. Through reinterpretation the role of Time within the theory of relativity turns out to be essentially different. This is elaborated further in this book. The presented vision on Time is new. Likewise the chosen approach to the landscape of Time in which untrodden paths are taken. The effort as described in this book is therefore not finished and cannot be complete, but it provides just a start.

I would like to invite you to look over my shoulders reading this book, and thus enrich your image of Time and - I hope - also renew this image in the interests of yourself and society.

H.J. Gels, October 2018

Time as a fundamental reality

Contents:

Preface.....	3
1. Introduction.....	7
2. The Time in a historical perspective	10
2.1 History of the sense of time.....	10
2.2 History of time measurement and time calculation	17
2.3 History of instruments of measuring time.....	21
3. Time and Space.....	25
3.1 Spatial rotation(s) and Time	25
3.2 Other influences on Time	31
3.3 An important note to the third Kepler law	32
4. Time and (quantum) physics	36
5. Some experiments with Time	39
5.1 Experiment-1: Test with two precision clocks	39
5.2 Experiment-2: The cave experiment of Siffre	41
6. Polarity of Time.....	43
6.1 'Now' and 'Moment'.....	43
6.2 Our perception of the 'Now' lies in the past.....	43
6.3 The momentary, periodic and continuous	44
6.4 Zodiac clock as upper pole.....	44
6.5 Earth clock as lower pole	45
6.6 Solar clock as harmonising middle pole.....	46
6.7 Three different clocks simultaneously.....	46
7. The reality of Time.....	48
7.1 Definition of Time	48
7.2 The essence of Time	49
7.3 Capacities of Time.....	52
7.4 The connection between Space and Time.....	53
8. Time, light and colours	62
8.1 Light: waves or particles?	62
8.2 Light itself has no speed!	62
8.3 Colours: continuum or polarity?	63
8.4 The complete spectrum of light.....	65

Time as a fundamental reality

8.5	Effects of light	65
8.6	Materials have also a colour signature	67
8.7	Another view on the theory of relativity	67
9.	Time, rhythm and 'life'	70
9.1	Capacities of 'life' itself	70
9.2	The Chinese and rhythms of life	71
9.3	Chronobiology	72
10.	Time and the Moon	75
10.1	The Moon and clock time	75
10.2	Influence of the Moon on nature	75
10.3	Influence of the Moon on ebb and flow	77
10.4	Influence of the Moon on man	78
10.5	The Moon and pregnancy	79
11.	Example of a multiple clock	81
12.	Significance of Time	83
12.1	Time-polarity and our experience of Time	83
12.2	Time-polarity and value system	89
12.3	Time pressure	92
12.4	Time in society	94
12.5	Time = Money	95
12.6	Daylight saving time or 'summer time'	96
	Closing word	98
	APPENDIX-1: Standard Model of particle physics	100
	APPENDIX-2: The functioning of the atomic clock	106
	Literature overview	110
	Keywords register	114

1. Introduction

It is the prevailing public view that Time has only one dimension, namely the line that runs from the past through the present to the future. According to the mathematician Hermann Minkowski (1864-1909), Time is just a fourth dimension of Space. In fact, Albert Einstein (1879-1955) built on this and according to him Time does not even exist, Time is no more than an illusion. In his famous relativity theory, therefore, there is only so-called 'space-time'. That rather confrontational view of time by Einstein is not based on observation, but on ideas based on observations and thus on interpretation! Although that theory has curious implications, it seems that there is no longer any doubt about the correctness of that theory ... but it can be rejected! The theory of relativity is based on the tunnel vision of the physicist. In this book we indicate why we can rightly speak of a tunnel vision here. We have gratefully made use of the critical comments and views from Rudolf Steiner (1861-1925). Gradually we cannot escape a fundamentally different conception of Time: Time is not relative but absolute. For reassurance, it should be emphasized here that this does not affect the validity of the theory of relativity, but does reduce that theory to the area where it is valid: the dead physical reality of Space. Its validity ends when entering the living analog reality of Time. With the concept of 'space-time' the theory of relativity has confiscated the reality of Time, almost unnoticed. Since then, it has deformed our daily perception of Time and with it our daily existence in society. A society which is dominated by the standardized clock.

A new conception of time obviously has consequences. The rhythmically living nature including our own organism is fundamentally unfit for listening to the inexorable 'tick tick' measure of the usual standardized clock. Yet that clock with its timing has, since 1967, been internationally anchored in law for many applications in daily life including the time of the current world clock! That should be urgently corrected ... Like Henri Bergson, Christine Cayol says: "*...we must stop telling ourselves that there is only one time that is in service of the race to action. It is about 'varying the times' according to the activities.*" And therefore, based on the structure of Time.

On closer inspection it appears that not only Space, but also Time is composed, albeit in a slightly different way than Space. As a first impression we're already giving this distinction a shot. When we talk about the phenomenon of Time, most people think of the time as indicated by the usual clock. The globally standardized clock from which we all read what time it is and how long it takes. This is the chronological or sequential time of 24 hours per day, which moves with the flow of the passing time. That sequence belongs to the area of **causality**, where the consequences arise from the cause.

In addition, there is our own inner experience of time, which is usually seen as something completely independent of chronological time mentioned above. How we experience time ourselves is of course personal and highly dependent on the context, the situation and / or events and how we ourselves (want to) deal with our time. The latter does not only apply individually in the here and now, it also applies to entire cultures over longer periods. But that in itself does not make Time random or accidental. In ancient cultures we see how Time affects the course of history, how the time frame changes step by step and thus reflects the becoming of humanity. Every culture deals with Time in its own way and with its own characteristic set of intentions and aspirations. Christine Cayol⁴ says about China: "*The country seems to be*

Time as a fundamental reality

propelled by an energy that comes from the future." This is the chronotopical or goal-dependent time. That goal dependency belongs to the area of **finality**. Antique dealers and archaeologists are very familiar with the chronotopic 'reading' of artefacts and soil discoveries in determining the origin and the historical context.

At this point we have already identified two 'dimensions' of Time. And there is a third to be pointed out. For thousands of years humanity did not live to the moving hands of the ticking clock, but to the movements of the sun and / or the moon in the sky. That is indeed the basis of our usual clock for the standardized 24 hours, but that is not quite the same! On the contrary. People lived more or less consciously with the cyclical varying in living nature. Since the prehistoric times, the twelve hours of the day and of the night vary in length with the rhythm of the sun and the seasons. After the solstice of 21 December, the period between sunrise and sunset will be slightly longer every day; after the solstice of 21 June, that period will be slightly shorter every day. In fact, during the summer we have long hours during the day and short hours during the winter. The opposite applies to the night hours. Everybody knows that somewhere, but in modern society we barely take any account of this. Consciousness for this variation, of the rhythm of the Solar time including our own biological clock, has virtually disappeared from our daily lives.

In short, for now we have already identified at least three types of time:

- 1) a fixed chronological time (24 hours x 60 minutes),
- 2) an inwardly experienced chronotopical time,
- 3) a varying biological time (with long summer days and long winter night hours).

Everyone uses the three dimensions of Space as a matter of course. We are simply brought up with it and learn to count with it from primary school. That self-evidence is unfortunately lacking when dealing with the aforementioned three types of time. Both space and time are fundamental to our existence! Therefore also our views of Space and Time. They both do the same! At least they would have to do as much.

This book shows that the current conception and application of Time is too simple and must be seriously enriched. The standardized 'normal' clock time dominates our daily lives for too long. Our lives have slowly but surely been subjected to the fixed 'tick tick' measure of the standardized chronological clock. This has a mechanised effect on our lives. And its consequences, albeit creeping along barely unnoticed. For living nature, for all living beings - also for us as humans - rhythm is much more important than measure. That is what nature itself tells us in a convincing way: every organism has 'built in' its own biological clock up to the cellular level, including a mechanism with which it harmonises its own biological clock with the rotation of the Earth and the surrounding world! The biological clock works with great precision, according to research by Nobel laureates Jeffrey Hall, Michael Rosbash and Michael Young. They isolated a gene (Per3) that is necessary for determining the biological rhythm and showed that certain proteins determine the functioning of the biological clock. This mechanism appears to have arisen early in evolution, and is therefore reflected in all other organisms - including humans. Living nature is therefore fundamentally unsuitable for listening to our standardized mechanical clock. The varying rhythm of the sundial was formerly instinctively

⁴ See the book 'Waarom de Chinezen de Tijd mee hebben' page 94

Time as a fundamental reality

called the 'True Time'! In our opinion, this biological Solar clock requires serious rehabilitation. Of course we also have to take into account the chronology of Time and keep to some extent 'measure' - 'everything (also) in moderation'. But then in an adapted way. So far this introduction has shot ahead.

Meanwhile, several clocks came up. Such a clock is of course not the Time itself. The clock is only a tool or mechanism to adjust the time resp. to be able to determine a time.

Just as the three dimensions of Space are necessary to orientate us in Space, so are the three types of time, identified above, necessary to orient ourselves in Time. Where we already note that - in contrast to **quantity** in Space - **quality** also plays an essential indispensable role in the phenomenon of Time.

2. The Time in a historical perspective

We begin with a description of how our awareness of Time has evolved over the centuries and how we, as mankind gave expression to it. This creates a good starting point for our disquisition.

2.1 History of the sense of time

For the primitives in the ancient eras and the wandering nomad Time is not an issue. They lived naturally with nature in the rhythm of morning, afternoon, evening and night. From one day to the next through the seasons and years. But Time has a prominent place in more developed cultures, especially in rituals and seasonal festivals, religions and mythologies. This is expressed in all dominant cultures and religions. Here are a few examples.

In ancient India we find the highest God Krishna in his trinity of Brahma (the Creator or the Beginning), Vishnu (the Sustainer or the Middle) and Shiva (the Destroyer or the End). In the holy book 'Bhagavad Gita' there are some statements about Time in chapters 10 and 11. In chapter 10 Krishna says: "*Of the creations I am the beginning and the end, and also the middle.*" And: "*... of the lights I am the brilliant Sun ...; of the stars I am the Moon.*" In chapter 11 Krishna says: "*Time is I, etc.*".

With the ancient Persians we meet the highest God Zurvān, the God of Time. Everything started with the primal god Zurvān Akarana ('unborn Time'). Zurvān was the father of the God Ahura Mazdao, the good God of Light and of the God Ahriman, the evil God of Darkness. These were actually two aspects of Time: the infinite time (of Ahura Mazdao) and the time of a long reign (of Ahriman). Sun and Moon - sources of light and the daily and annual rhythms - were considered the eyes of the good God Ahura Mazdao.

In ancient Egypt we find the God Re at the top of creation. From the forehead of Re came Ma-āt, the Light of the world, placed as a world order against the world of chaos. From it the God Re created the gods Shoe (life / water) and Tefnut (truth / air). From them came the gods Geb (Earth) and Noët (Heaven). They gave birth to four children: Osiris, Isis, Seth and Nephthys. That is the moment in creation where Time receives both duration and periodicity. The origin of the cosmic rhythm of the Sun and the Moon, the Day (Neneh) and the Night (Djet). Osiris says of himself: "*I am Yesterday, Today and Tomorrow*". The Time as an eternal cycle was represented as the snake biting itself into the tail, the Ouroboros. The word 'hour' would come through the Latin 'hora' and Greek 'ora' from the Egyptian god Horus, the sun god and child of Isis and Osiris.

According to Greek mythology Ouranos created the universe. His son Chronos is starting Time. In the view of the ancient Greeks Time does not 'tick tick' forward, but Time (Chronos) flows through the divine river Oceanos, which surrounds Earth and Universe as a cosmic serpent with the Zodiac on its back. In the cosmic Night, Chronos creates an egg from the world ether. As soon as that was broken, the hermaphroditic demiurge Phanes emerged, which then creates our world. The time-god Aiōn was represented as an eternal winged serpent (the Ouroboros) that constantly rejuvenates itself. Herakleitos (Heraclitus) of Ephesus said, "*panta rhei*",

Time as a fundamental reality

everything flows. That also applies to Time. In this view, time is not digital / discontinuous, but fundamentally analogous!

We also find Time in the biblical book of Genesis. The writer of Genesis speaks of the Hebrew '*jom*', translated as '*Day*' (Deus in Latin). But that biblical '*Day*' is not our usual day of 24-hours. Every '*Day*' of creation corresponds to the Greek Aiōn (Aiōn = eternity), which encompasses an immense period in which an Aiōn, as a divine Time-god, delivers a guiding contribution to the ongoing creation work. In other words, Time is active from the beginning of creation. In the terminology of Dionysus the Aeropagiet, these Aiōns are the Archaï (Early Beginnings or Time Spirits), each with its own mission in the divine creation work and with its own quality. According to Steiner, they are the servants of the 7 Elohim: "*There, where the Elohim had created Light by their higher ordering forces, there they placed 'jom' in their place, the 'first' beings, the Archaï or Time Spirits...*". This is reflected in our weekdays: Sunday, Monday, Tuesday (Mars-day), Wednesday (Mercury-day), Thursday (Jupiter-day), Friday (Venus-day) and Saturday (Saturn-day). According to Genesis, Light and Darkness are created on the first day of creation: "*God separated Light and Darkness. He called the Light day, the Darkness he called night.*" But Time only gets its rhythm and periodicity on the fourth day of creation: "*Lights must come to the sky to separate the day from the night. They have to indicate the seasons and the days and the years.*" The great Light (the Sun) to rule the day, the little Light (the Moon) to rule the night.

Among the Aztecs the supreme god, Tonacatecutli, was the 'Lord of Time' who maintains all life on Earth⁵.

For thousands of years, until modern times, Time was conceived as of high divine origin, where divine entities themselves were directly involved in the becoming of creation, mankind and history. And - importantly - there is always the creation of Light and Darkness, followed by the creation of Time with its rhythm and periodicity. Every time, the Light God or Sun God is directly involved!

Thoughts about Time in ancient history

Great thinkers have racked their brains about the subject of Time. Gerard Bodifée described the different views about Time in a very accessible way in his very readable book '*Nu is de Tijd*' (Now is the Time). The following is mainly derived from his book.

The question of the nature of Being lies at the basis of the question about the reality of Time: something that was in the past, is in the present, and will be or will be in the future, or is not at all. From this comes the question about the nature of the (eternal) everlasting and, on the other hand, the changing, and about truth and delusion. Gerard Bodifée devotes extensive attention to these issues in his book. But let us leave it for what it is and focus on Time, that is the: past-present-future, and the momentary, cyclical and everlasting.

Plato starts from a philosophy, with views about Creation and a Creator. In the regularity of the movements of celestial bodies he recognises the moving image of eternity, thus the image of Time. Those movements are perceptible to us. **Through the perception of these movements**

⁵ See the book '*Tijd – ritme en rust*' (Time – rhythm and rest) of Marie-Louise von Franz page 71

Time as a fundamental reality

we become aware of Time in our soul. Sun, Moon and planets are the hands of a cosmic clock, instruments of Time, not Time itself. This also applies to the division of time with its numbers as indicators. Counting the numbers or the 'measuring' of Time can only take place in the soul. So, a sense of Time and with that the meaning of Time can only arise in the soul, not in the body.

In his 'Physica', **Aristotle** builds up his approach to Time by using definitions of concepts, such as definitions of movement or change and continuity. His definition of time is: *time is the number of the movement according to 'before and after'. Time is not the movement itself, but the thing through which the movement has a number.* (The following must be noted here: a number is an etheric⁶ phenomenon and therefore has a Janus head: a 'counting' quantitative side and a 'telling' qualitative side.) Over the centuries, the qualitative side of the number from the ordinary consciousness disappeared, while in numerical symbolism - which traces back to Pythagoras' theory of music - its core has been preserved. When a movement is assigned a number, then the quantitative side focuses on the sensory perceptible reality of the physical Space and the qualitative side to the non-sensory perceptible reality of the living Time. Aristotle distinguishes three kinds of movement or change: a qualitative, a quantitative and a displacement. Time and movement or change are inextricably linked to each other according to Aristotle. Displacement occurs through movement over a distance. Distance is a continuous line, so displacement is continuous and Time is continuous. That is why there are endless 'Now' moments and there is no end to Time. Through the functioning of Time resp. through movement everything ages and falls into decline. Aristotle is consistent: if there is no longer a soul to attach a number to movement and therefore no longer to count those numbers, there is no existence of Time anymore. Then there is still the existence of displacement, but no more existence of Time. He also recognises (spiritual) beings that exist outside of Time and Space, so outside of the world that enables our sensory perception. Those beings are perfect, eternal, unchangeable, unperturbed and independent.

In his 'Enneads', **Plotinus** builds on the thinking of Plato and Aristotle. He describes Time as follows. "*Time is the life of the Soul in its movement from one state of being to the other.*" Time exists in and with the Soul, but the Soul does not exist in Time, the Soul is eternal and awakens Time. Time and world are 'products' of the Soul. Our individual soul is one with the World Soul.

Augustine (354-430) describes his thoughts about Time in the eleventh book of his Confessions. He writes that there was never a Time without Time. What is eternal does not exist in Time. "*There are three times: a present tense of the past, a present tense of the present, and a present tense of the future.*" The first he calls the remembrance, the second the contemplation, and the third the expectation. He has struggled intensively with the question of what Time is and the paradoxes he encountered. Augustine was really inspired when he decided to study Time in the world of sounds and examining the Gestalt (time body) of a sound. Before a sound sounded, it was still the future and could not be measured. If a sound has sounded it is over and cannot be measured. Sound can only be measured while it sounds. That is how it is with Time. He concludes that time measuring is only possible on the basis of the traces that events in the soul, in memory, leave behind. In his view the 'Now' brings or transforms the future into the past. "In the observation I transform the expectation into remembrance. I do that all my life. Time only

⁶ Ref. GA-101 the third lecture about Numerology and GA-204 the eighth lecture about 'Size, Number and Weight' by Rudolf Steiner.