

# The Quantization of Time

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## Abstract

In the present work it will be shown, that time is not an additional dimension of space, as the specific theory of relativity demands, but an indeterminate unity of future, present and past that takes effect within the dimensions of space.

**Introduction** That space and time represent the basic forms of existence in nature is clearly undisputed. On the other hand, not undisputed is, if we take the standpoint of philosophy and describe space and time as a form of existence of the human brain. Here, time then disintegrates into the modi of past, present and future, or, as Augustine said, into “the present of the past, the present of the given-now and the present of the future” (1).

Indeed, with such a description, we could expect a certain agreement from the neurophysiology, which in fact supports a time-modus of past, present and future in order that we can consciously perceive the point in time of the given-Now (33). Surely, the hope of agreement with the exact science would be in vain. At least if we were to ask Einstein. Because, according to him, the division of time "between past, present and future has only the meaning of an illusion, even if this is a persistent illusion" (50). But indeed, this is only to be expected from the author of the specific and general theory of relativity.

However, also within the realm of exact science, this is not undisputed. Because if we follow the theories of Einstein, we are compelled to cast the laws of physics in a form of physics, that contains a four-dimensional symmetry. However, if we now use these laws to arrive the results of observations, we are then forced to again introduce the three-dimensional cross-section of reality, because only

this cross-section can describe our perception of the world as a particular point in time (15). Thus, so to say, through the back door of observations, the three modi of time re-enter.

From this we may conclude that two ways of viewing time exist, that clearly irreconcilable with each other: that one of philosophy and that one of exact science, which again decays into two ways of viewing: the causality of the theory of relativity (17, 18) and the acausality of quantum mechanics (29). This certainly makes the matter not any simpler.

But here, it is not our purpose to discredit the viewpoint of exact science or of philosophy or to pit the two against each other. At any rate, both viewpoints are without exception sidereal hours of human perception. Far more, we are concerned with the unification of both. Therein, the unifying of quantum mechanics and the theory of relativity is integrated.

However, before we consider such unification in detail, for a moment we would like to depart from time and view space separately. Here, we wish to remark: Our task is not with exact science or philosophy, as one would assume for such a work, but architecture, which serves here as our qualification in the subject of space.

At this point, the objection could be raised that space is not unknown in either philosophy or exact science. This we do not wish to dispute at all.

Nevertheless, here space is described either as an “extension” (4) or must be “boundless” (19), while architects must always distinguish between inner and outer space and observe the boundary between both in order to bestow existence and form. And that this boundary is not only of architectural importance, but also a fundamental principle of nature, is firmly shown by natural phenomena. For, every natural phenomenon takes its form in terms of the boundary, that separating its inner from its outer, whether the human brain or cells or elementary matter.

With respect to space, then, we are speaking neither of an extension nor a boundless space, but of a boundary within space. To which time must be added. Of course not separately from “extension” (4), or as dimension in addition to a three dimensional space, so that one "must view space and time objectively and inseparable as a four-dimensional continuum" (19). Thus, time is to be seen as an indeterminate unity of future, present and past, which takes effect within the dimensions of space.

This corresponds to the Augustinian description of time (1). But of course not limited to human consciousness as Kant’s “thing as such” (35<sup>1</sup>) demands because, not only the human brain but every natural phenomenon in its boundaries is structured by the three dimensions of space, and also by the three modi of time. In short: In nature, we are not concerned with an “extension” and, separately, with a “duration” (4), or with an “inseparable unity of space and time” (19), but with a bounded space of time within in an unbounded space of timelessness.

A remark remains here concerning the method. This, we reference to as our acquired capability to combine different professions to a three-dimensional form. This is mentioned here, because we wish to proceed in the same manner with the spatial classification of time. However, this is not because we wish to propose a new assumption about the modi of time. Rather, we will make known and proven phenomena recognisable in its temporality structure, whether deriving from philosophy or from exact science, and transpose these to space, which nature undoubtedly demands. Thereby the bounded space is structured as the natural inner space of time, while the unbounded space is revealed as the natural outer space of

timelessness. A graphic representation is given in Figure 1

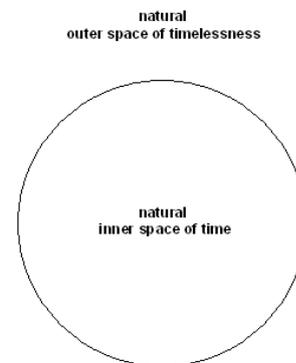


Fig. 1

**Future Thought** Time is an aspect of natural inner space. Looking more closely, the following emerges: time appears in the behaviour of elementary matter and in the behaviour of cell, finding its cognitive form in the human mind. Thus: in the human mind, cognition and time form an intrinsic unity, so that cognition is time, and time cognition. So, if we want to spatially classify time, why not start here, where each of us is most familiar with it. So, let's begin with our mind's cognitive capabilities, and turn to thought, which is equated with cognition. Because, since René Descartes established: “I think, therefore I am” (11), and raised this phrase to the first principle of his philosophy, thought has been considered the cognitive distinction of reason.

To understand this we will first briefly address the basics of Cartesian philosophy, more precisely. Of course, Descartes did not invent thought. People thought, and called it so, before. What is meant is rather the “thinking I”, which he took as the pivot of reason. Here, thought is removed from the unity of sensory perception by separating it from the body and attributing it to the mind and spirit. Consequently, only thought can penetrate to objective truth, whereas “visual and emotional comprehension” must fall away as subjective forms of cognition. Their cognition is to be met with suspicion (12<sup>1</sup>). In short: Cartesian distinction of reason is founded only in the self-confidence of the “thinking I”, detached from “visual and

emotional” comprehension and able to progress to provable cognition.

From this we may conclude: thought is extensive cognition and therefore cognition of time in the unity and division of past, present and future. Simultaneous, this uniting and dividing moment cannot be assigned to thought; it can only comprehend the future.

For thought moves ahead in a generalising, appraising and judging manner, leaving the Given-Now to arrive from one target-point via the next to a new target-content. This is called discursive capability, which has change as its content, in order to predict events so and only so. But even if thought only seeks to secure the already existing, it can never stand still in the Given-Now. Rather, it constantly moves towards an apparition, who appears to be within reach and determinable in thought, even though it is not yet really present. Only comprehension of the future can reach this apparition. In short: the power and strength of thought is evidenced in its comprehension of the future. However, cognition of time cannot be derived from this.

If Descartes says that only the “thinking I” can resist the “evil spirit” (12<sup>2</sup>) that pretends to teach truth, yet necessarily deceives, our answer is: thought itself deceives us by saying time when it can mean only future. This places time into a situation of future distortion. A graphic representation is given in Figure 2

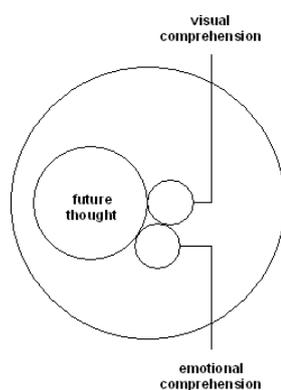


Fig. 2

**Spatial-Temporal Cognition** Let us turn to the human brain as the locus of thought. Of course, not only thought is located here. It shares this location with visual and emotional comprehension that

Descartes described as suspicious cognition. Nevertheless: visual and emotional comprehension constitutes spatial-temporal cognition together with thought. But we began by assuming that future thought had to be complemented by the first dimension. Subsequently, the past can be attributed to visual comprehension in the second dimension, to find the present in emotional comprehension, which unifies the first and second dimensions, raising these to the third. Space and time thus merge here to form cognition.

To understand this we refer to the two cerebral hemispheres and the limbic system, hence to a spatially organised brain structure which proves to be multiplying interlinked (8; 31; 32). So, via the limbic system, the sensory organs are directly linked and, with the exception of the olfactory bulb, cross-linked with both cerebral hemispheres which can communicate independently via the corpus callosum. There is no direct external link between the cerebral hemispheres. This suggests a functional architecture of cognition. The three forms of comprehension of spatial-temporal cognition are assigned to this architecture.

As regards cognition, the motory and sensory speech area is located in the left cerebral hemisphere. Here, the sensory speech area controls our speech comprehension so that we form the correct terms, translate these into words and script, and understand them in logical order (59), while the motory speech area is responsible for our speech capability and for correct sentence structure (7).

Since speech and thought form an inseparable unit we find Descartes' “thinking I” in the left cerebral hemisphere and therefore also the locus of future comprehension. However, the question remains how space is structured here. To answer we recall discursive capability. Because with this alone, thought can isolate itself from visual and emotional comprehension to focus on a target-content, which it must approach step by step. This can be achieved through a detour, without departing generally from the pre-determined direction, as the target-content could otherwise not be reached. This direction is transferred to its spatial capacity, which is assigned to linear comprehension in the first dimension. In short: the left cerebral hemisphere is linked with the one-dimensional-future comprehension, and subject

only to this spatial-temporal capacity - and no other.

As disclosed, we will now address the spatial-temporal contribution of the right hemisphere to cognition. Here, we refer to Roger W. Sperry (54), who first recognised that "split-brain patients" continue to react verbally with regard to the left cerebral hemisphere. Conversely, their reactions in the right hemisphere region were of a non-verbal nature and displayed a considerable superiority in the visual region. The result would be: along with thought, Descartes' visual comprehension is also related herein.

This enables us to allocate comprehension of the past to the right cerebral hemisphere. But what significance does visual comprehension have for the past? To answer this one can say: an image is the likeness of things and events that reproduce that excerpt of a reality, which relates to a previous event and stores the past within itself as a likeness. This is also valid for visual comprehension, whether it is a likeness of the outer or inner world that is recalled from memory.

That such a likeness pertains to the second dimension is shown by a painting. A painting may catch the present moment of an event in perspectival elevation, transporting it into the past, but no matter how skilful and faithful a rendition of reality it is, it can only ever simulate space. It perpetually remains attached to the surface. The contribution of the right cerebral hemisphere illuminates in two-dimensional-past comprehension, which moves two-dimensionally towards the space without filling it. Thus, this hemisphere is characterised by non-verbal speech, which borrows its energy from the likeness of the past and speaks to us two-dimensionally-integrally.

That leaves the limbic system and its contribution to spatial-temporal cognition. Here, we refer to Walter Rudolf Hess (30), who first identified the limbic system as the locus of emotion. The result would be: along with thought and visual comprehension, Descartes' emotional comprehension is locally classified.

This allows us to attribute comprehension of the present to the limbic system. But what relation does emotional comprehension have to the present? The answer: emotion only exists in the Here and Now. And, since emotion is fundamentally linked to the individual, this implies

a mutual interdependence, so that neither the individual nor his/her emotions could be transferable. In short: emotion shows itself plainly in individual expression and expresses itself in the present moment.

Individual impression stands in opposition to this expression. Only here do we comprehend the moment that we call present. We are not aware that any emotion could exist within the Not-Yet or the No-More which could have effect without any relation to reality in the future or the past. Love or hate, happiness or sadness are, if they are, only in the given Now, for which the immediate reality is its precondition. Our emotions have no access whatsoever to the has-been or the will-be.

Still: emotion is not completely isolated. It has the past image and future thought at its side. Thus, it once again moves towards either the one-dimensional-future or the two-dimensional-past, depending on which impressions reality has in store or we demand of it. Hence, emotion does not allow any determinable predictions, but is subject to probability. We know from experience: our emotions are much too indeterminable for them to be transferable into the near or distant future, to be felt again just as they feel Here and Now. In short: emotion reveals itself in an indeterminate, present sense of time.

This sense of time leads to three-dimensional cognition. For, because one-dimensional-future thought and two-dimensional-past comprehension collide, the line raises the area in the space in a progressive movement to unite three-dimensionally-present in emotion. In this movement, the definition of time and the associated definition of space emerge, the second dimension following the first, and the union of both producing the third dimension.

Only in the unity and division of the three areas of the human brain can cognition reveal itself. And this cognition is spatial-temporal cognition, without following the law of causality as future thought would have as believe. Quantum mechanics (29) proofs this. But there is a long way to go until then. First of all the spatial-temporal relation between the brain and elementary matter must be uncovered. Here, this is called the natural inner space of time. A graphic representation is given in Figure 3

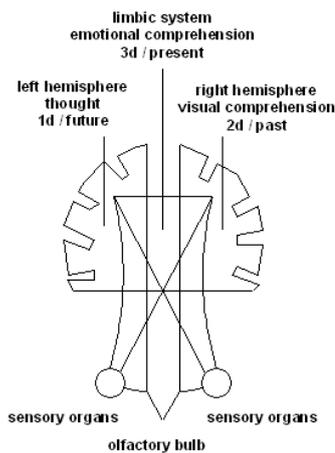


Fig. 3

**Structural Generalization of Time** That space and time are given to us as “pure forms of perception”, this said Immanuel Kant. If we look to Kant for our relation to the outer world we meet the “thing as such” (35<sup>1</sup>). Kant concludes that, due to our intuition, we cannot identify the things of the outer world, as space and time do not belong to them. But here, an objection is required. The Things of the outer world adheres to the same spatial-temporal structure as the human brain. A structural generalization substantiates this.

To understand this, we refer to the structure of the brain. Both the cerebral hemispheres and the limbic system are of relevance here. If we abstract this structure and transpose it into a time structure, the cerebral hemispheres can certainly begin to appear as vaulted segments of the future and the past that enclose the limbic system as the core element of the present. Consequently, future and past would together form an enclosure that, as a spatial structure, demarcates itself from the outside in order to enclose the present within itself. Looking more closely, such a structure cannot apply because it only abstracts the anatomical structure, but does not take spatial-temporal cognition into consideration. For, with regard to this cognition, only the spatial boundary can apply to the limbic system, only three-dimensional-present cognition can occur here. In short: in the process of abstraction the limbic system must be emphasised as the decisive element of space, so that a spatial-temporal structure can only be represented as contrary to brain anatomy.

This is how it looks: in an inversion process, the limbic system appears as if turned inside-out and forms the vaulted inner space of present cognition, whose relation to outer space is definite by the sensory organs. As both cerebral hemispheres are included in this process they contract from outside to inside. Seen like this, anatomical structure is reduced to its spatial-temporal cognition. At any rate, thought and visual comprehension are now completely surrounded by emotion, which definite three-dimensional-present cognition. This describes a time-sphere, which here serves as a structural model. With regard to our announcement to demonstrate temporal structure also independently of the brain, the following image results: Time lays claim to the sphere that confines the space of the present with its directionless volume. The structure elements of time, like the one-dimensional element of future and the two-dimensional element of past are stored in this space. Admittedly, they are not isolated here, but are linked to one another, like the corpus callosum, as well as both directly and indirectly linked and cross-linked to the edge of the sphere, just like the course of the olfactory bulb and the other sensations. Here, this is called energy-lines of time.

Thus: the time-sphere, with its spatial temporal structure elements and energy-lines, envelopes the natural inner space of time. This regulates the spatial relation of time cognition and elementary behaviour, within which one-dimensional-future thought, is confined. A graphic representation is given in Figure 4

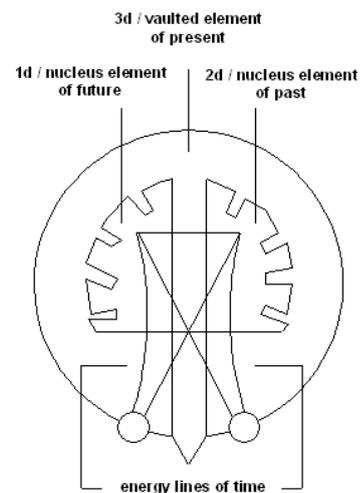


Fig. 4

**Elementary Time** The question about space and time outside the brain must be asked and lead to a conclusion. But this is easier said than done. Admittedly, since time began, the universe has been asserted as space of time, and this idea was enforced by Plato (48) through Newton (41) to Einstein (17).

But where in the universe is time to be found? Is time bound to the rotation of the stars, as Plato's *Timaios* claims? This would only mean that temporal structure could be found in the moving order of the planets. Or should we refer to Newton's absolute time? Must we consider the universe as an endlessly void container so that neither space nor time could demonstrate any ascertainable structure? Or are space and time inseparably bound to matter as Einstein asserts? Is temporal structure therefore revealed in the unity of space, light and emitting source? If so, to light there would similarly have to be added a before, as well as an after, whereas the given Now appears in the flux between before and after.

If we look around questioningly, we come to the realisation: time is not as unstructured as Newton *Philosophia* claimed. But also Plato's *Timaios* and Einstein's specific theory of relativity cannot evince the structural features of time. It should merely be demonstrated that none of the previous time theories have taken the spatial classification of time into consideration, and cannot, therefore, achieve that to which they claim to aspire.

Because temporal structure is neither to be found in the universal rotation of the stars, nor in the unity of space, light and emitting source, but within this source itself. What we mean is the natural phenomenon called atom. Only the atom, with its spatial unity of shell (5) and nucleus (51; 9) can reveal the structural features of time. Consequently, time is revealed within the atomic shell as a phenomenon of natural inner space.

To understand this we will forget the atomic hydrogen for one moment and confine ourselves to helium, whose two protons and neutrons we respectively summarise as units, and which we then put into a quiescent state. In this way we can put aside atomic diversity (39) as well as the Pauli principle (43) and the alternation of identity within the nucleus (61) In short: we concentrate on the "atom as such". If we now bring this atom into line with the time-sphere, the correspondence between

present boundary and electron shell becomes evident. This allows us to conclude that electrons are time-particles of the present, while protons and neutrons are assumed to be the nuclear particles of the future and the past.

But in order to understand which modi of time should be attributed to the nuclear particles, we refer to the energy flux between future and present. Therefore, the future influences the present, not vice versa. However unusual this order of influence seems, it becomes even more compelling if we follow the condition of the future towards its end, one which cannot come to an end, because the future can never end itself. This identifies a future-endless energy flux in which the present finds its beginning. It is this energy flux which allows the positive charge of the proton (51) to emerge as the future elementary particle, which has its opposite in the negative charge (36) of the electron as the present elementary particle. That leaves the neutron (9) for the past, which corresponds well to its neutrally charged burden, and which both proton and electron must preserve within themselves, just as future and present are preserved within the likeness of the past.

Outside the brain, time appears within the atomic inner space. Here the neutron preserves the past, or the No-More, within itself while the proton provides the un-ended future, or the Not-Yet, so that, in the union of both, the given Now can completely assert itself within the electron shell. A graphic representation is given in Fig. 5

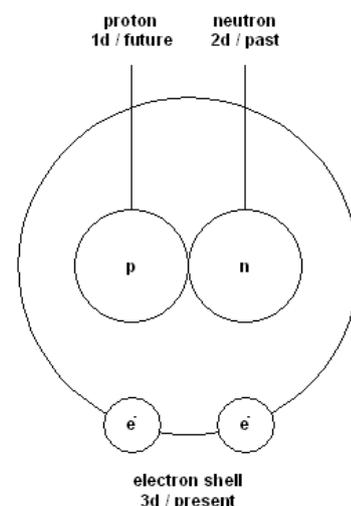


Fig. 5

**0-Point of Time** The discussion has, until now, clearly emphasised natural inner space. Here we confine ourselves to the spatial-temporal features of the were able to brain and the atom, even though temporal behaviour seems more complex and the energy-line has not yet been bound in. This necessitates the inclusion of the universe. Meanwhile, neither the “standard model” nor the “big-bang” (57) here are helpful. We rather refer to the atomic hydrogen which, with its proton, occupies the first place in the periodical system of the elements (39). Since all the subsequent elements possess additional neutrons, a nuclear gradation suggests itself, which leads to the conclusion that this gradation is of a temporal nature. Here, this is called the 0-point of time. With this, the boundary between inner and outer space, and access to the fundamental energy of time, without which such tying-in is impossible, are revealed.

To understand this we would like to suggest a thought experiment and to consider nature in an ideal state, in which only one hydrogen atom exists. If we assume that all other elements are contained in its nuclear gradation, it follows this: as the 0-point of time, this atom cannot exist alone. It is inconceivable without the universe. This suggests a spatial contrast of inner and outer, and emphasises the significance of the boundary.

Admittedly, this boundary never relates to just one space. Although it makes clear the inner and its expansion, it also suggests the expansion of the outer. And, since elementary space reveals itself in its present, a universal definition of time can be derived from it. However not in the sense that the universe must limit itself in the present rather from the common boundary to the present, it follows that the boundless present must be particular to the universe.

Therefore, even if the outer expresses its presentness at the common boundary, as a condition of the inner, no boundary is imposed on it.

Although elementary space presupposes universal space, and both are characterised by their common boundary, this boundary can nevertheless be dissolved. Going one step further to suppose that even the hydrogen atom no longer exists, this by no means necessarily signifies a universal dissolution of space but rather that this space cannot be deprived of its existence. However, if we

do not agree with this, we instead limit our assumption and say: space now acquires a new quality. For not just the hydrogen atom has lost its boundary, so has the universe. From this we conclude: universe and hydrogen atom must go over into a third which can demonstrate its existence below both. This third must remain invisible and exist perpetually, for neither the universe nor the hydrogen atom could otherwise exist. Here, this is called bounded-unbounded expansion, which has to exist in present-perpetuity.

This expansion can be seen as the absolute that gains relevance through its contradiction. For what else is such an expansion, other than a contradiction? After all, two mutually opposing characteristics of space come to light which could never possess such simultaneous expansion, but, nevertheless, have to be attributed to it. At any rate, an “either-or” is out of the question because “either” this expansion must be present-bounded so that its expanse can be concretised, “or” it is unbounded. That leaves the perpetual-unbounded, which cannot be recognised as space since, robbed of its boundary, this expansion would have to dissolve and vanish.

The familiarisation with outer space may have become somewhat conceptual. For this reason we would like to insert a parallel from physics. Paul Adrian Maurice Dirac has put forward a convincing theory on this subject. Namely, the “Diracian Sea” (13; 14) which, in the mass of its negative energy, is just as invisible yet it must exist. This embodies a contradiction, just as a present-bounded perpetual-unbounded expansion demands.

Now it becomes clear why we refer to the hydrogen atom but neglect the “standard model” and “big-bang”. While for both a “space as such” must suffice, lacking any kind of boundary, the spatial opposites of universe and hydrogen atom lead to just such a boundary. This puts an end to the unrelated juxtaposition of macro and microcosm, allowing them to merge. But this would not remain without consequences for the universe. For then microwave background radiation (46) could no longer be considered as a radiation from the early universe (45), which should presumably expand out of its singularity and into nothingness. This radiation should rather

be considered a boundary to expansion which takes effect if we want to penetrate through to this edge, but which shows its unboundedness if we try to definite this edge. The redshift behaviour (26) is as with microwave background radiation. In this respect the redshift and microwave background radiation evidences an invisible and self-contradictory expansion that exists beneath the material world. In physics this is called the Dirac Sea, which offers some information regarding the fundamental energy of time. A graphic representation is given in Figure 6

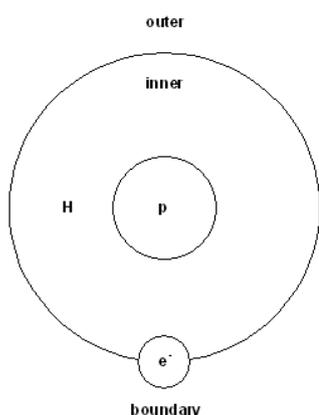


Fig. 6

**Fundamental Energy of Time** That the Dirac Sea behaves in a self-contradictory manner was suggested by the red shift and background radiation. The same will apply to the fundamental energy of time. Thus, the contradiction will emerge as the driving force.

Here at last, some words should be added regarding the contradiction. When we talk about contradiction, we always mean a dialectical never a logical contradiction. On one hand we have to keep the logical contradiction out of the scientific cognition process, while on the other we have to take the dialectical contradiction into consideration. So the question is: to what extent does logic tolerate dialectic? To put it as briefly as possible: logic can be detected in one-dimensional-future thought, dialectic in spatial-temporal cognition. Admittedly, this is an awkward affair. That thought refers to logic and has to endeavour to reach a non-contradictory result is clear. But this must not lead to making logic an absolute that

dictates our understanding of time and allocates dialectic to logical contradiction, meaning we would have to renounce it. For renouncing contradiction would mean renouncing the principle of movement.

In this case we cite Georg Wilhelm Friedrich Hegel, who described the contradiction as “the root of all movement and liveliness” (27<sup>1</sup>). And when Hegel says the contradiction itself “is in general that which includes the one and its other, itself and its opposite” (28), this can be considered a reference to the Dirac Sea, which is simultaneously an electron boundary and a positron hole (13; 14). Here we have identified the contradiction marked out as the very driving force within the extraordinary electron that reveals itself as the proton structure. This is where the fundamental energy is located.

To understand this, it must be stated that this one contradiction is not the end of the matter, as a thought experiment will show. If we focus on any one of the extraordinary electrons and simply remove the electron boundary, the positron hole is by no means eliminated. It is rather the case that this hole goes over into a spatial expansion which may be unbounded, but which contains a boundary nevertheless. In other words: in the unity of the extraordinary electron, the contradiction not only gains relevance in the incompatible opposites of electron boundary and positron hole but also within the positron hole itself. This suggests a vertical compression. Thus, in the internal conflict of being simultaneously bounded and unbounded, the positron hole must exert pressure on the boundary within itself, which can only respond with counter-pressure. This is evidenced in the positron's boundary.

Of course, that doesn't mean that the contradiction is lifted and the positron has entered an inert state. Because even if the bounded is fixed within the positron, its unbounded remains, according to the Pauli principle (43), this reveals itself as the second of the extraordinary electrons, which happens to be assigned to the One as its Other. Thus, within the Dirac Sea a mutually opposing and self-contradictory particle structure, with the positron as the bounded and the electron-positron hole as the bounded within the unbounded, and the unbounded itself, takes effect.

Now we may assert: here we mean the recondite-

ons for the desired fundamental energy. This could, but need not, be rejected.

After all, we are dealing with the vertical compression of dialectical contradiction and, within this contra-diction with the principle of the negation of negation (27<sup>2</sup>). If we follow this principle and observe the series of conditions (22); the electron-positron hole should turn into a myon/anti-myon pair in the first step of negation and in the second into a neutral pion. On the whole, this corresponds to a positron, u-quark, anti-u-quark structure, which must produce a third. Therefore, in the irreconcilable conflict with itself to be simultaneously bounded and un-bounded, the anti-u-quark must experience a pressure inversion, drawing along the positron. This, the u-quark, u-quark, d-quark structure of a proton produces. In short: we should not understand the proton to be a decaying elementary particle (23), as the "Unity of all elementary-particle forces" demands, but as the constitutive elementary particle of nature.

The contradiction is located within the proton, to be irreconcilably effective as the vertical driving force. If we now consider Einstein's velocity vector as a fundamental property of this force the contradiction then emerges as electric energy. This is characterised as split light, just as demanded by quantum chromo-dynamics (QCD). Here we refer to the "ultraviolet behaviour of non-Abelian gauge theories" (25), as well as to the particle theory of light (16). In other words: in the state of "asymptotic freedom", light here approaches particle character, while its wave nature becomes apparent under the opposite conditions. This is called the fundamental energy of time. As this energy constantly aims at its boundary, without ever being able to limit itself, the proton must rise up as a time-particle of future, thereby pulling the electron with it, whose boundary we had dissolved and which we must now reinsert. Only in this way the hydrogen atom can show itself as the 0-point of time.

We are aware that this derivation lacks any mathematical or experimental validation. Of course, this is not our task. We are primarily concerned with the quantization of time and with the principle of the boundary so that such validation can take place at all. This demands a self-contradictory expansion of negative energy. If we agree with this – and we have no other choice –

not only the fundamental energy of time can be vertically derived from it but also, horizontally, gravitation.

Of course, a re-evaluation of the proof of the existence of ether (40) is also required as a re-evaluation of the general theory of relativity (18). Therein a rethinking of the string theory (49) is integrated. In other words: with the Diracian Sea, the ether once again enters the discussion. However, now no longer as an essence within space but, as the essence of space, which experiences a curvature in the presence of heavy mass. This is how it looks: one cannot talk of a rising hydrogen atom if this would impose the image of a sea on which this atom could float. Rather, this meant a mass condition of positive energy within a Mass condition of negative energy. So consider that the hydrogen atom exerts a displacing energy against which this condition must react with equal force, indeed compressing this atom generally and compressing and stretching between its particles – i.e. gravitational field. Consequently, this cannot be a power of attraction. Rather, gravitation must be regarded as the spherical effective energy of a displaced and self-contradictory sea of extraordinary electrons whose broken vertical compression appears as a volume constant of electromagnetic processes. Thus: in relation to the electron, Einstein's velocity vector must penetrate the proton, one-dimensionally and in-future unites with gravitation here. In this respect: as velocity vector this compression is contained within the spatial coordinates of gravitation, admittedly without being spatial itself. Here this is called electromagnetic-interaction which takes effect as volume quantum. The Quantization of Space provides information on this (58). Note: This violates neither Newton's definition (42) nor Maxwell's equations (38) nor the Compton Effect (10).

Additionally, while Dirac's Sea exhibits two extraordinary electrons "below", the hydrogen atom must make do with one electron "above". This imposes a horizontal imbalance on the hydrogen atom. In this respect, the vertical fundamental energy must be complemented by a horizontal imbalance which provides the temporal classification of the energy-lines in the space of gravitation. A graphic representation is given in Figure 7

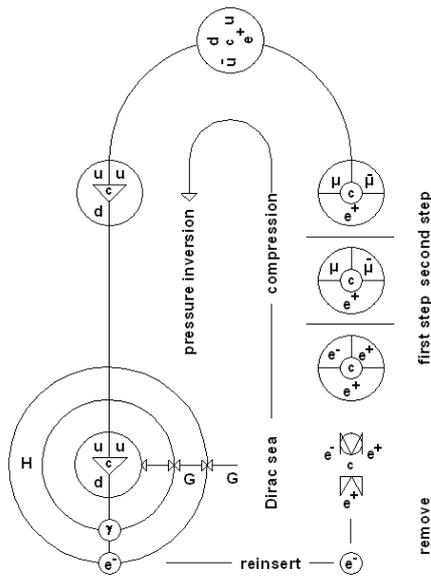


Fig. 7

**Energy Lines of Time** Let's take a look at the energy-lines of time, which must be identical with the elementary interactions so that their spatial classification has a basis. Here, we refer to the electromagnetic (38), strong (61) and weak interactions (56; 24; 53), where the mass defect must also be considered (20), reflecting the situation for the spatial-temporal classification of all elementary interactions.

To understand this we refer to the formation of helium, i.e. the fusion process of two hydrogen atoms into deuterium (3). Here, physics describes the collision of two naked hydrogen nuclei which fuse into deuterium, while we include the electron shell. For: if we assume a horizontal imbalance of hydrogen and firstly concentrate on one of the atoms, this atom must spiral into itself and exert a constantly increasing compression. Through this the electron is compressed into the hydrogen nucleus along the electromagnetic energy line, or into the future-un-bounded of the fundamental energy, to collide at some point with a u-quark. The electron becomes a d-quark that must enclose an anti-u-quark within itself. This corresponds to the quark structure of a neutron, which additionally contains a negative pion (22)) just as the boundary of time demands. For, when the present-bounded of the electron is compressed into the future-unbounded fundamental energy, neither can completely fuse into the other. This prevents the boundary within the unbounded. Rather, the bounded will remain and deposit only the present

in the future, like an electric deposition. This is characterised as the burden of the past, which take effect on the energy line between past and present, in accordance with the mass defect (20). Here this is called (electro-)mass defect.

Of course, the present-bounded cannot remain and persist in stasis. Rather, it will take the electric deposition with it and continue to aim for the future-un-bounded: i.e., the second of the hydrogen atoms that makes its electron available to the present, and its proton to the future, in order to enter into a strong interaction with its fundamental energy of time. This corresponds to the interacting pion (22) that provides a continuous alternation of identity between the elementary future and the past, thus demonstrating the strong interaction to be an (electro-)strong interaction.

The weak interaction is integrated into this. For, if the electron is compressed into the hydrogen nucleus, a photon must also be involved. Of course, not in the sense that the photon and electron could deposit themselves in the past without a trace, rather each will leave its impression, which reveals itself as positron and neutrino (22; 41). In this sense, we should find the opposite of the present in the emitted positron, and the opposite of the photon in the neutrino, which is now assigned to light as darkness. Darkness, then, which we perceive at night or in shadow, would not just exist "as such", but derived from the impression of the fundamental energy. This impression displays the very energy line of time with which the weak interaction coincides. Here this is called (electro-)weak interaction.

If we transpose the aforementioned onto the "atom as such", the following image emerges: within gravitation the (electro-)strong interaction is caught between the proton of future and the neutron of past, like the corpus callosum, while the (electro-)mass defect takes effect between the neutron of past and the electron of present, and "last but not least" the (electro-)magnetic interaction between the proton of future and the electron of present. Consequently, via the energy lines, two electrons in the shell are each connected with protons and neutrons in the nucleus, as with the direct and crosslinked course of the sensory impressions. Thus, in favour of the darkness, a direct energy line between past and present remains for the (electro-)weak interaction. This

corresponds to a uniform description of all elementary interactions.

We have no doubt that this image refers to the time-sphere with its time-particles. For if we break off the atomic stasis and convert the "atom as such" into a "decaying atom as such", not only does the continual alternation of nuclear identity stop, so that protons and neutrons can emerge independently as elementary particles of future and past. Rather, with the beta decay, the (electro-)weak interaction again takes effect. Here, of course, the return of a photon is lacking, which now proves the irreversibility of time in the anti-neutrino. Thus, in the irreversibility of time, future is directly linked with present. This corresponds to the course of the olfactory bulb and is to be added as decay line.

But that is not the end of the matter. Beyond this, the (electro-)weak interaction could be considered a bridge linking elementary and vital nature, i.e., the cell with its DNA and RNA (52). If we consider both, the proton and RNA as energy sources of future, then we find this interaction also within the cell, on which the DNA (55) appears as carrier of the past, which makes the identity stored within itself available to natural phenomena. This gives an answer of the analogy of parity violation (37; 60) and laevorotatory protein molecule (34). In this respect we should see an (electro-)weak process in vital nature, for which nature varies its never changing theme. This theme is called time which does not only appear as elementary matter, but similarly also as cell and human brain. A graphic representation is given in Figure. 8

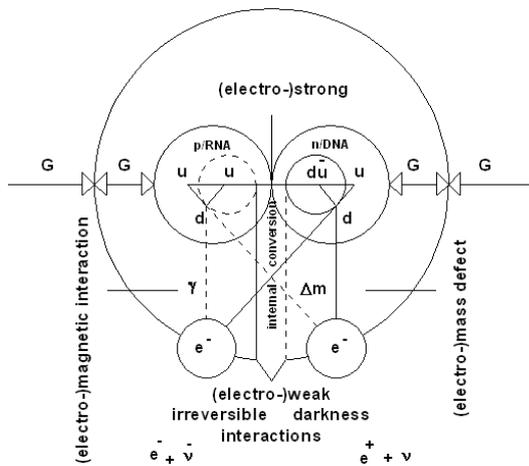


Fig. 8

**Behaviour of Time** To conclude, let us speak about the behaviour of time, which reappears in elementary behaviour, and reveals itself in radiation energy.

Here, we will refer to the quantum-mechanics (29) and say with Werner Heisenberg that "the orbit (of an electron) only originates because we observe it". This observation must apply to the behaviour of time. Naturally, this must not be interpreted to the effect that time does not have any real existence. Rather, time measurement now becomes a priority. This leads to the indeterminateness established by the measuring result. For, if the variables of the electron can never be determinable simultaneously and with discretionary accuracy, i.e., its location and impulse, this must also apply to time's variables.

Or: just as the linearly determinable end-point of future energy cannot be spatial present, nor the presently spatial beginning future-linear, their fusion into one another can also not be continual. Hence, the presently spatial continuity can only behave in a discontinuous manner, therefore making the desired time measurement seem indeterminate. Here this is called a volume quantum (58), which comes to light as action quantum (47), the only real moment of time.

However, this statement does not deal with the elementary behaviour of time sufficiently, because it neglects the past. Here, we cannot limit our discussion to one electron. Rather, we must concentrate on two, as the "atom as such" demands. Let us remember the past, which not only stores the present within itself, but also the future. This asserts that the variables of the electron, but also the uninterrupted flux of future energy is stored in the elementary likeness of the past. This had already suggested itself in the formation of deutron.

Thus, both present location and future impulse appear multiplied as facticities in the neutron. Consequently, countless facts and events must be stored within the neutron, which takes effect into the natural inner space as a burdened likeness of the past. Presumably, this is responsible for the spin-reversal of an electron. However, this reversal changes neither the presently spatial continuity of the electron, nor its discontinuity. What changes is its local composition which, burdened by itself, opposes its beginning as the end of the present. In

short: we concentrate on two electrons, because the present beginning cannot exist without its ending. This puts the imbalanced movement of the hydrogen atom into a state of relative stasis.

It remains to be said: the elementary present moves between the Not-Yet future energy and the No-More past burden, i.e., between the two modi of time that are mutually interdependent yet incompatible with one another. This steadies the natural inner space, transferring the acausality. Thus remains the action-quantum (47) which in the Given-Now glows colourfully. Hence, within the elementary present, the action of the given Now is:

$$6,626 \times 10^{-34} \text{Js}$$

The specific theory of relativity (17) does not change this. This theory depends on the electromagnetic interaction alone, which takes effect in the natural inner space as the one-dimensional-future-energy-line of time.

As previously announced, we would like to address the interpretations of quantum mechanics. After all, this form of mechanics distinctly contradicts the generally accepted idea of space and time for which, even 80 years after it was established, no convincing solution has been found (2).

Thought is responsible for this, which is evidenced by the “Principles of Succession in Time, in Accordance with the Law of Causality” (35). According to this, causality is not only a necessary category of thought, without which we could neither order our perceptions nor reach empirical findings, but also the form of reasoning that, with its linearity, is particular to the left cerebral hemisphere. In this respect, Cartesian thought, must be added to Kantian causality. In other words in the left hemisphere, a one-dimensional-future energy, committed to causality, takes effect, which characterises cognition and its relation to elementary time. In short: cognition, which is characterised by thought, stands uncomprehendingly in direct opposition to the behaviour of elementary time as its own likeness. Not only does the negative attitude towards quantum-mechanics become understandable here (2), but also the futility of interpretation attempts that, without exception, endeavour to reconstruct the causal chain.

The Bohr idea of complementarity (6) doesn't change anything here either. Admittedly, Bohr was able to express acausal natural behaviour in an adequate theory by putting complementarity into opposition with the law of causality on an elementary level. Nonetheless, he was not able to expose time in its acausality. And if Heisenberg says: “As all experiments are subject to the laws of quantum mechanics, and therefore also to the equation:

$$p_1 q_1 \sim h.$$

quantum-mechanics definitively establishes the invalidity of the law of causality” (29), one is forced to agree, of course, only adding: “since elementary matter is not subject of space and time, but is an expression of time as natural inner space”. Where Einstein's velocity vector is located (58), admittedly without being spatial itself. Thus: within the specific theory of relativity tempus (t) must be exchanged against futurae (f):

$$ds^2 = c^2 df^2 - dx^2 - dy^2 - dz^2$$

That regulates the relationship between quantum mechanics and the theory of relativity and puts the equations of time into a correct spatial order. However, the (electro-)mass defect between the neutron of past and the electron of present must still be added, while clocks and yardsticks are left. They have to be regarded as a cultural convention. Here, this is called: The Quantization of Time. A graphic representation is given in Figure 9

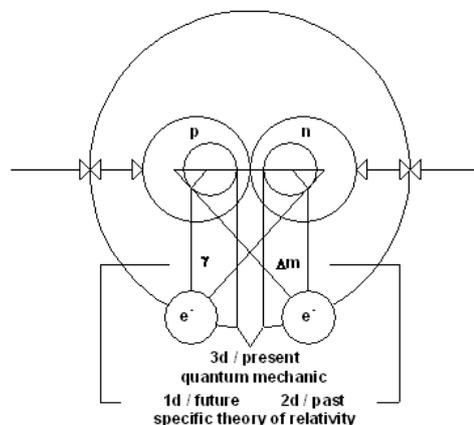


Fig. 9

**Conclusion:** In the present work we talk about The Quantization of Time. However we do not wish to withhold from the reader our real intention, which aims at thought. To be sure, we are less concerned with what thought is capable - which should be a fairly familiar issue - but with its incapability, to which a self-destructive effect is causally inherent.

Yet in order to understand why we do not talk about thought itself, but rather go about it in a roundabout way, as it were, by talking about time, we must refer to the human mind and voice a reservation which has always occupied us. To wit, we should not fail to recognise that in the human mind, thought always remains stuck on the level of that which is being thought. Yet this would not only prevent thought from recognising itself; it also includes the recognition of those natural phenomena which exist outside of thought. In other words, there is reason to worry that thought continuously confirms itself, preventing us from thinking in thoughts about thought.

Nonetheless, we agree with the reader on this point: doubt in the ability of thought to recognise something is by no means appropriate inasmuch as the phenomena are certainly accessible to thought outside of thought itself, for instance in their being distinguished by characteristics of their external appearance or their inherent natural laws. This obviously enables thought to allocate these phenomena to animate and inanimate nature. Still, we must point out that this ability to distinguish always originates in and is subject to thought; hence it cannot serve as convincing proof of its cognitive faculty.

Viewed in this light, we remain at least doubtful about whether thought can actually recognise the natural phenomena and its own position within them.

We talk about time so as to be able to answer decisively the question inherent in this. For by presuming that time belongs both to human mind as a cognitive entity and to the remaining natural phenomena, it turns out to be their joint reference: therefore it may be used as a cognitive means outside of thought. This is to say that it is time alone from which we may expect to gain information about the relationship between human beings and nature, as it alone can show the reflection of nature and mind. Consequently, we do not have to expect to arrive at the confirmation of thought here of which we were afraid, and are therefore able to avoid it. Space needs be added, as time has made space its condition, and space time. This appears as three-dimensional-present behaviour of nature, which is indeterminate in itself or acausal.

So far, so good - or not. For if we take into consideration that the human mind is in its essence integrated in the behaviour of nature and furthermore that within the human mind the energy of thought takes effect and so transforms acausality into causality, then, from the resulting imbalance, we not only must conclude that the behaviour of nature is destroyed by thought, but also that thought is destroyed by itself. Here his is could: Cartesian Thought. This must be considered.

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