

# “S.T.E.C.” Space-Time\_Energy-Consciousness

## THE PARADOX IN MODEL MAKING

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### Abstract

Models exist in many forms; many of these go beyond the level of words, or communicable systems. The recognition of models goes even beyond what we consciously know. The basis of modelling can be sought in Languageing, as many authors have done (Grinder & Bandler, 1975). They can even be identified in the dynamic organisation of our neurones, as more recent work has shown (Maturana & Varela, 1980). That being the case, the inherent cross-interaction of the models we make, and the system in which we make them, is an issue to be considered. It calls for an understanding of our body (and neurones) not as a computing machine, but as information processor in a more 'rarefied' (and extended) sense than science can yet show, within the limitations that Cultural Consensus imposes. As long as these human limits to human-made models are ignored, we can't get beyond to perceive reality as it is: our models, conditioning our mind, will be (culturally conditioned) unconsciously in our way. This paper proposes reconsideration from first principles, by showing a relationship between Space, Time, Energy and Consciousness which help to get to the basis of the models we make, beyond the forms they can take.

**Keywords:** Systems, Integration, Languageing, Psychologics, Topologics, Biologics, Embryologics, Structures.

### 1. Introduction

Man Made Models always reflect our human limitations (O#o, 1982). But how can we account for them, if we do not take them into account?

This paper makes the point that we need to include the role of our Consciousness in everything that we do. That means: whatever we experience, express, expect, even *how* we exist must be accounted for, by the forms of consciousness we use. It is common knowledge now, that we are *not* aware of our consciousness as such: we have Consciousness, Subconsciousness and Unconsciousness; there is even reason to include domains outside of our consciousness as being part of consciousness too (O#o, 1993). The lack of precision in the available descriptions already makes clear *how unconscious* our conscious is, even to us. But how can we understand the Reality we live, if we have

no awareness of the 'instrument' by which it is made; the Consciousness we use? How can we discern the 'Signal' from the 'Noise', or the Fact from the Artefact, if Consciousness is never described or regarded at all, as factor of our Realisation in the models we make and use?

It is evident that any tool we use leaves its traces on all we use it for: the same holds for our mind (deKerckhove, 1992). It is necessary then to *first* understand our mind, and determine a form of communication by which we can understand its role in our findings. Including how it affects us. *Then* we can communicate with others about what we find. "Communicate", is something we do all the times, with our environment, and with ourselves. There is a whole 'food chain' of interactions, in different kinds of code, by which we relate to our environment, and ourselves. Whole series, chains and cascade of cycles of dynamic processes, of the kind that i.a. Systems Theory described. In fact, *anything* humanity has described bears the traces of the instrument by which it came to be made: Mind. The consciousness we use. And so, instead of having to start all anew, we can understand all **our** realisations, Realities, Sciences, Theories and **Models**, as reflections and **representations** of the tool by which they were made. Like a bedding reflects the flows of a river, our models, and reality, are reflections of **our mind**. This paper boils it down to First Principles, and argues that the foundations of all our beliefs, are reflections of our own mental processes too. In terms of universal principles that are essential to all we know. It therefor relates the basis of consciousness to the deepest level of reality we know: our mathematical philosophical logical interpretation of the 'realities' of **Space and Time**, as they are unified by **Energy** in the realities we know. The point is made that the definition and formulation of these Fundamental Units, are *consequential* to our use of **Consciousness** too. They are united thereby, and need to be always regarded together, as integrated and unified. Here they are regarded as "Space-Time\_Energy-Consciousness", the logical construct of integration of Consciousness Energy, Space and Time.

This paper thus relates the Know to our Knowing. Objectivity and Subjectivity (O#o, 1996e) are understood as simple changes of a state of mind; which can/must be expressed and described in *all* our equations too. Mathematics, Physics, Sociology and Psychology have already created the Languaging tools by which such relational transformations can be described, and understood: as changes in the Reference Systems we use (O#o, 1997c). This explains the title for this paper: we are dealing with a recursion, thus a 'Paradox'. The models we *use*, model *ourselves*. They are representations of the way we function, ourselves. By making this explicit, this 'Paradox' can be made clear, and resolved.

The conclusion then is simple (as will be pointed out): Space, Time, Energy and Consciousness, are simply reflections of the same. We perceive them as seemingly different, only because of a bias in the sampling by which they are (seemingly) perceived. The same is seen in the distinction of Vibrations as 'motion', 'sound', 'radio waves' and 'light', on basis of their *relative* difference in wavelength *with respect to us*. By making our own involvement in reality explicit, the relationship between such 'seemingly Separates' (and their 'discongruence') can be resolved. Not only does that help to understand how Reality is a Realisation (that we culturally share), but also that

Realisations are Creations by our own minds (which we have hardly learned to understand, thus use).

By making the relationship between realisation and reality explicit, much is to be gained. The following brings that down to its most essential form: Consciousness is the basis of our perceptions of Energy, which we organise into processes in Time, and forms of coherence in Space. The distinction between them depends only on the identification in our own point of view, and is thus arbitrary. This has deep consequences: it shows that Science and Mysticism are but two *forms of the same*; the differences in their types of Languageing (together with Arts and Commerce/Communication) are but *transformations on the identifications we make* (O#o, 1999a). Our perception thus *always* depends on our standpoint, outlook and perspective: It depends on, and is determined by, the viewpoint we have. **Reality is a consequence of our realisations.**

The role of the observer can *never* be ignored in the observation (O#o, 1997a); if this is done, the realisation is incomplete. For this reason it is not enough to regard reality as a structure of Energy in Time and Space: the role of Consciousness *must* be included in this description too. *Reality is a realisation thus creation* of our mind; if the role of our mind is ignored, it is also not understood, including all (side) effect it may have. We thus need to *include consciousness in every model of reality that we make.*

This does not mean that we have to create models of consciousness as such: everything that humanity has made, is made *by* our consciousness too: individually and collectively; it only needs to be understood in this way. Every model of reality, is a model of our mind. We can thus understand *all* models that humans made, as descriptions of our mind; 'seen inside out'. By making this explicit we can account for any error in the process of realisation itself (which can now not be seen because the role of our (un)Conscious is ignored). Consciousness *must* be explicitly accounted for. Reality is nowadays thought to be an 'objective truth', instead of a Collective-Consensus-Creation, from/by our mind. The 'Scientist' is not only *not* an Outsider to the Reality we see, but also an active agent in *defining* the reality we know. This is the essence of the finding presented here. (It integrates the understanding of the physical sciences with that of information/systems engineering, unified with the medical understanding of our living origins as seen in a mathematical philosophical logical frame.) It Unifies our collective understanding of Energy (linking Space in Time), in terms of our Consciousness, by/in the use of our mind(s). By giving consciousness an explicit place in our equations, its role in our creations can no longer be ignored. (This has important consequences for our experience of the qualities of life.)

It is important to realise that in this interwovenness, of Realising and Reality (like in the interplay between a river and its bedding), the conclusions are never definite and clear. It is an interactive process *always*. (This has been well shown in the development of science over the past century.) It is now 'evident' that Reality is neither Objective, nor Relativistic or Probabilistic, nor only a Unified field: it is all at the same time. What Physics still regards as four seemingly separate (fundamental) Forces, are four (FundaMental) aspects of they way *we* are involved. The four Fundamental Forces are

the same, seen in different ways. They thereby merely reflect the same coherence in different ways. By understanding the intricate relationship between Energy, Time and Space, as aspects of Consciousness, their integration can be seen and understood with/in our own mind(s). It is in the integration of the different states of consciousness, representing the different forms of our involvement in the whole, that that interconnectedness is seen. Because this is implied in the Boundary Transition (and the Phase inversion cycle that it implies) by which the Outsider ('objective' "scientist") and Insider ('subjective' "mystic") are linked. (O#o, 1999a) This paper sets out to make that role of our consciousness clear. Linking Consciousness integrally with our perception of Energy, Time and Space.

## 2. The Principle

The integration of Consciousness into our fundamental units of Energy, Time and Space is simple, in essence. (Cf. Langhaar, 1951, Schönfelt-1970) This integration has its basis in the concepts by which they are defined: **Space** is our definition of recognition of patterns 'that are the same'; it identifies the concepts that are fixed. **Time** is the indicator of the processes of change; this defines variability and relationships. **Energy** describes the transformations involved: the conversion of patterns of coherence from one state to another. This is understood to be preserved in all circumstances. **Consciousness** then adds the concept of coherence in a more explicit form. Which we can regard from our different perspectives of involvement: objective (coherence), relative (co-ordination) interactive (correlation), and control (consciousness). (Cf. Young, 1976.)

We can describe the same in more simplified terms: **Space** is a Structure of organisation with regularity beyond time; the time basis is null for the perceptions involved. This can be described as a Standing Wave. **Time** then is the equivalent of a Translational Wave, in which a process is contained (as in an envelope) while its state is maintained: the energy conversion in this case is null. Likewise we regard **Energy** as a wave changing shape, thus phase. This applies to all cases where structures are deformed in time, yet remain coherent (or preserved). It concerns all such cases where our change of consciousness is null. (Which is not always the case. When we sleep, die, wake up or are born, the equations of physical reality no longer apply: we must take shifts of **Consciousness** into account.) To pursue the metaphor: this is where waves merge or emerge ((de)compress)..

In short: Space is comparable to a Standing Wave, Time a Translational Wave, Energy a Wave's shift of Phase, and Consciousness the (e)mergence of waves.

In this way, Space, Time, Energy and Consciousness can all be understood in equivalent terms; as (but) different aspects of the same: forms and degrees of co-ordination. There is thus no (real) need to discern between them (at) all, except for purposes of making our Reference more clear. All Objects in Spaces are (stable) *processes in Time* (specific examples of a more general case). Likewise, all Processes in Time are *Transformations of Energy*; again but a more simplified case of a general state. The point made here is

that the same applies to Energy too: transformations of Energy are but a specific case of *shifts in Phase*. The concept involved is always the same.

There is then no need to regard them as 'separate' and 'apart'; it is more logical to describe them in unified terms: as Space-Time-Energy-Consciousness (to connect with the currently customary consensus description based on the 'Classical scientific objective point of view'). Or rather as Consciousness, Energy, Time and Space. (This is how the sequence should rather be, by the abstract point of view of modern science (Kaku, 1987). This conforms with the cosmological understanding that the Big Bang (dimensional creation) led to Cosmic Gas Clouds (energy transformation) then forming Suns (time processes) and only then Planets (spatial structures). The description of the integration of the four dimensions (STEC) goes beyond the scope of this paper here and is described elsewhere.

### **3. The Realisation (See Table 1.)**

The unification of Consciousness with Energy, Time and Space has been suggested before. Young (1976) described the interconnectedness of Position ([Space]), Velocity ([Time]), Acceleration ([Energy]) and "Control" ([Consciousness]).





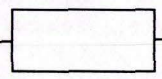
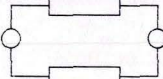
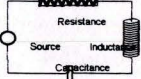





The Dynamic coherence between the four aspects of phase has been implied in the description by Bazsó (1996), in describing the differentials of Boolean Space. It applies the notions of differentiation (= orthogonalisation) in terms of transformations of Logic. Such differentiations are also studied in Systems Theory, then implied in the dynamic relationships between Elements and Branches of Circuits of Control. This approach can be generalised for any system. (Schönfeld, 1970).

By seeing how the differential equations concerned relate to Dimensional States (Langhaar, 1951), the pattern implied becomes clear yet again (Young, 1976). The same is seen in the implied relationship between Coil and Capacitor (dual elements of variation) and Resistor and Source (dual elements of transformation). (It is from this dual-duality that the insight into the direct interwovenness of space, time, energy, consciousness originated.)

It must be borne in mind that differentiation, in a mathematical sense, is an orthogonalisation; as Matrix Theory describes (Schönfeld, 1970). Orthogonalisation is (in physics) known as phase inversion; it is commonly studied as a Boundary Transition, and described as a "Filter", in i.a. Signal and Information Theory. Transfer of Signal across a Filter is but yet again another example of the same principle; it is the coherence of the Phase Inversion as the (phase) orthogonalisation over the boundary takes place, by which the coherence of information can be seen. This integrates what Bazsó, Young, and differential calculus describe.

The differentiations [S] involved denote a boundary transition [T] defining a passage [E] from one domain [C] into another, by which the coherence [C] between an Open and Closed system [E] are [T] defined [S]. They are thus both related and defined by the Inversal they represent.

**Table 1 : 4-fold Reference sets.**

| SPACE  | TIME  | ENERGY  | CONSCIOUSNESS   | 4D ANALYSIS                                       |
|--|---|---|---|---|
| <br>Capacitor | <br>coil | <br>resistor | <br>source | System node/branch<br>type<br>Ξ                   |
| $I=C \cdot dV/dt$  | $V=L \cdot dI/dt$   | $R=V/I$   | $V=I \cdot R(\text{in}+\text{out})$   | System node equation                              |
| Structure  | Process   | Transformation  | Creation  | Manifestation level                               |
| Solid  | Liquid  | Gas   | Plasma  | Phase state                                       |
| 1  | N   | $\infty$  | 0   | Unit reference                                    |
| Objective  | Reflective  | Collective  | Subjective  | Perception  |
| Passive  | Reactive  | Interactive   | Creative<br>(Proactive)   | involvement                                       |
| Conscious  | Subconscious  | unconscious   | Conscious-less  | Awareness level                                   |
| Science  | art   | commerce  | mysticism   | Social Expression                                 |
| Output   | Perput  | TransPut  | Input   | System Function                                   |
|               |          |              |            | System Element                                    |
|               |          |              |            | Boundary transition<br>state<br>(cf. Mach conic ) |
| [1D]   | [2D]  | [3D]  | [4D]  | Degrees of freedom                                |
| Algebraic/<br>Geometric<br>Calculus  | Function Analysis   | Singularity<br>Transform Theory   | Dimensional<br>Analysis   | Mathematical<br>Reference                         |
| 1  | N   | $\infty$  | 0   | Mathematical Unit                                 |
| Integer  | Rational  | irRational  | Complex   | Mathematical<br>Functions                         |
| Classical  | Relativistic  | Probabilistic   | Field   | Physical Reference                                |
| Closed system  | Bounded system  | transforming<br>system  | open system   | System Type                                       |
| Physical   | Physiological   | NeuroCrine—<br>Immune   | Psycho-Cybernetic   | Physiological Response                            |
| Mechanical   | Pharmaceutical  | Electronic  | Nuclear   | Body Energy scale                                 |
| Descartes  | Einstein  | Planck  | Gabor   | Model   |
| Physics  | Chemistry   | Electro-<br>Magnetism   | Photon/Gravity  | Discipline  |
| Motion   | Sound   | Radio   | Light   | Vibration   |
| Matter   | Molecules   | Atoms   | Superstrings  | Reference   |
| Strong force   | weak force  | v d Waals Force   | Gravity   | Fundamental force                                 |
| yes  | yes-&-no  | not-Yes-&-not-No  | no  | 4D logic  |
| scalar   | vector  | tensor  | Spinor  | Unit  |
| position   | velocity  | acceleration  | control   | Arthur M. Young                                   |
| Closed system  | interface   | interaction   | open system   | System aspect                                     |

Ξ: This work was inspired by seeing the relationship between dual system, and their dual sets, in the work of C. J. Schönfelt (1970). Forthcoming work will elaborate on the equations involved.

In a psychological sense, the operations are equivalent to a 'zooming in on a Boundary'. By this it is 'seen' as a Field. (Zooming out produces the inverse). The concept of information passing *through* a filter/boundary is thereby not just a psychological, physical, mathematical concept, but of medical relevance too. Our existence is *based* on the phase rephasing implied. (For which "consciousness" is the best expression we (as yet) have.)

Implied in this is the notion of coherence/preservation of Consciousness. From a perspective of Metathematics (O#o, 1995), the integral equivalence between Space, Time, Energy and Consciousness can thereby be seen. (This is simply a repetition of principle as used in Dimensional Analysis (Langhaar, 1980), now applied to the Dimensional Set itself.) It is the pattern 4-fold dimensional differentiation (orthogonalisation) in which the consecutive orthogonalisations define a cyclic coherence within itself. The principle of 4D Dynamic Logic (O#o, 1982) is a more explicit formulation of this. STEC makes explicit that that this recursion in the 4-fold dimensional orthogonalisation integrates all aspects of the realities we know.

As each differentiation is an *orthogonalisation* (or 'boundary transition', relating a Closed to an Open system) then the Closure of the conversion is the essence of the transition event. This is just what Systems Theory describes (if understood in a 4D logical sense O#o, 1998a).

The transition 'through the boundary' represents a change of *involvement*, thus of *attachment*: the component of Consciousness is thereby defined. This is what STEC describes. In this approach the Objective, Reactive, Interactive and Subjective aspects are one and the same. (With interesting implications: the 'unification of the Four Fundamental Forces' is established therein; it is a straightforward consequence of using STEC.)

This also means that the Classical (Objective), Relativistic, Probabilistic and Unified (Field) perspectives are aspects of the same. (And that all findings of these different views of Science are interchangeable always.)

In passing through the boundary, the (locus of control) Subjective experience shifts: from Outsider ↔ Reactor ↔ Interactor ↔ Actor (creator).

The transition of the boundary thus represents a progressive (mutual) orthogonal Transformation of the Frames of Reference. It defines the transition of the boundary of Perception. This is how i.a. the transition is made from observing Matter, respectively Molecules, Atoms and Subatomic Fields. (This represents the historic transition from Physics to Chemistry to Electromagnetism to Photon/Gravity systems. In a Science Philosophical perspective it is shown as the transition from Classical to Relativistic to Quantum to ('Superstring') Field Theory.) Again, all are (in this approach) but one and the same.

STEC is simply the description of the recursion involved in any boundary transition (or System Inversion), of any kind. Which, as an operation, is *always* coherent (in 4D terms; O#o, 1989). This is how our psychic and psychologic functions are defined: in the coherence and interplay of the Subjective, Interactive, Reactive, and 'Objective' processes 'involved' (= perceive = realised). (O#o, 1999a).

*Because every Boundary is also always a Field, a logic is needed in which the two are always combined. In the 4D dynamic logic this goal is attained; the opposites are always known to be one; as aspects of the same.*

By this, the Boundary can not only be seen as a Field, but the Closed System as an Open System also. (By System Inversion, as described above.) Realising this, it only requires a consistent application of the Principle, to see the equivalence and identity of “Space  $\equiv$  Time  $\equiv$  Energy  $\equiv$  Consciousness”.

It does mean that *we* have to learn to Think differently than we were taught! We must realise that **Space** is a subset of **Time**, which is again a subset of **Energy**, which is a subset of **Consciousness**. And that it is *Consciousness* that determines how we realise reality. Consciousness is included in *everything* we do. Therefor: Consciousness needs to be included in *everything* we do. Including every model, theory or science we make.

In practice it requires nothing but a change of perspective: the realisation that the dimensions of Space are the same as those of Time (or Energy), but perceived in a different way. The change in perspective is made explicit in the definition of the reference systems we use; but even those are perceptions, thus creation of our mind. And thus related at a deeper level still. By including Consciousness in all our equations, STEC makes explicit that Reference systems are at the core of all we ‘see’. STEC shows that *all* we perceive is (thereby) connected. This means that even S, T, E and C are in fact the same. The ‘difference’ represents a *shift* of Frame of Reference: **Space** is the perception in an Euler (or Cartesian) frame of reference, **Time** the result of observation by a Lagrange (or dynamic) base reference system. **Energy** likewise is but that reality as seen by Transformational models (in which the reference system itself is conditional, thus at times not defined - the singularities of state -). It is evident that “Frames of Reference” is the essence connecting them all, including the realisation of Validity, need for Adaptation, and Criteria of Collapse of the reference systems themselves. It means our Referencing is expressed in, and by, the models we use. This can be made explicit, and described by the term “**Consciousness**”.

▪ In principle consciousness ‘is’ the Reference System; that can also refer to itself.

This recursion allows it to serve as a meta-reference system. This however only means that it is just another reference system (or perspective), ‘just like the rest’. The way *we* use it ‘puts them apart’ in the function they get. Yet, they are all (different forms of) the same. They are tools of/for our consciousness (and Mind).

There is no real need to distinguish between different approaches or Reference Systems, if the *principle* itself is maintained. (Systems Theory gives a great understanding for this; it provides the insights by which Space, Time, Energy and Consciousness can be seen as mutually defined; and but different ‘views’ on the ‘same’. State, Process, Transform and Emergence are herein but different aspects of the same.)

We can not see how *Consciousness is a model of the models we use*, as long as we *disregard* Consciousness; and with it the role of our thinking and models (thus realisations) in the reality we perceive (and create), All we see and do, reflects the Consciousness by which this is done.



Remark: This has direct practical consequences: we can see that/how Reality is a Realisation. The understanding of our understanding is essential for seeing *how* we see what we see. **Quantum** theory already encroached this, in realising that there is a fundamental uncertainty about what we see and how we see it. This was already an important step beyond the notion that our observations are Relative, determined by the Perspective we take; as implied in the theory of **Relativity**. This again was already a major leap ahead in understanding that there is *no* fixed reality (or truth) as **Classical** science assumed (and imposed).

Now the notion is even more direct: our models of reality, are models of the mind; in the double sense of the word.) *What* we perceive is a function of *how* we perceive it, which is transformed by the conditions we live. There is an important recursivity implied in this, which Classical Science (and its models of Space) could not address, nor understand. The dynamics are more complex than Relativity realises, as the imposed definitions (such as the Border of Light), are arbitrary, and can be inverted. The transitions involved are more integrated that Quantum Theory can perceive; as it too is still limited to a particular singular perspective (even when regarding not "Particles" but "Waves"). At the moment that the simultaneity is seen of the Observation and the Observed, it is clear that Open Systems and Closed Systems are, always, the same. They are discerned only by the discernments *we* make (Spencer-Brown, 1973). The *implication* is that *reality is a sensation* reflecting our senses. The model of a Hologram (interference of waves) is of great use to understand this in depth. Especially when regarded in terms of systems theory, where dynamics and states are but different aspects of the same. Likewise we can understand that the part *is* the whole (Starkermann, 1996). The part is the whole, seen inside-out. (For which the interface is a site of inversion (= Boundary); or 'mirror'(Maya).) That Understanding applies to our Understanding itself; it means that **what we see is how we look**. The models we use condition our mind; and vice versa. This recursion is 'seen' throughout nature: e.g. as a river and its bedding together lead the rain back to the sea, to evaporate into rain clouds again. Recursion is an essence of the consciousness we use. This needs to be made explicit in the models we use and make.

#### 4. The Relevance

Evidently the exclusion of *consciousness* from the models we make has flawed the *truth* (validity) of what we see. If our models do *not* reflect on themselves, the patterns they *contain* are *not* seen in those they *represent*. They are tools, only, of the mind; and have no bearing on (the 'truth') of the reality that is. Once it is seen that a model is but a Languaging Device, instrumental in creating consensus (like a pseudopod of some microbes), *then* we can determine how our models relate to us, other models, and 'reality'(our realisation). In fact, all models we have (in science, art, commerce and mysticism) are all expressions of the same: each model reflects but an aspect of *our thinking*, and is determined by the ways *our bodies* function. By disregarding the role of the models on our mind (thus realisation), we can not see how **reality is the result of the ways in which we think**. The design of the Model of STEC is created for this: to

make our models, and limitations, explicit, by accounting for them in all we do. This can only be done by connecting our Thinking (process) to our Thoughts (findings); as the model described.

It means that we can not discuss 'Dimensions', and 'the Basis of Reality', without including ourselves in the description. *We*, and our thinking, *must* be made explicit in the models we make. STEC helps by simplifying the way. *If* those fundamental 'Dimensions' ([S], [T], [E], [C]) are the most basic issues (beliefs) of our (collective) mind, *then* our Mind must be expressible/expressed in the same. Our mind (Realisation) can then thus be described 1) in terms of dimensions, and 2) in the form of a model. By using STEC, our models of Realisation can then come to replace our (consequential) models of Reality.) It help see that our models (realisations) are *not* 'True' (reality) but only creations (tools) for our mind (communication).

STEC does precisely that: it studies the relationship between Consciousness and Energy, in Time and Space. It comes to realise that *all* are but *phases* of the same. By recognising the *models* involved, the recursive *patterns* can be seen, regardless of their *forms*. By understanding that **Space** reflects the structured modes of perspective, seemingly coherent and conditionally invariant, then **Time** can be recognised to be the Variable/Variant form of the same. Mathematicians have indicated this (Fourier Calculus), already centuries, without however drawing the conclusions from what they described: if Space is 'Invertable' with Time (as e.g. the Fourier Transforms show), then Time is as 'Solid' as Space. And as 'Spatial' too. The mathematics of Feynman already showed this: we can 'navigate back and forth' in Time, operating in the Future as in the Past. The duality/complementarity between Space and Time was already explicated in the notion of Space-Time. All we need to realise is that that is not a specific case, but a general rule. (Just as Relativity is not 'generally' seen, but only in the 'examples' we know.) What we understand of Space-Time holds for Energy-Consciousness too; and for the relationship between the two, in Space-Time\_Energy-Consciousness (a dual-dual set).

By seeing how the modulations of (material) *Phase* in Space are in fact modifications of (wave) *Phase* in Time, which are again but shifts of (complex vector) *Phase* in Energy, then it is clear that *Phase* is the core concept of Consciousness too. This can be made more explicit by showing how systems theory integrates the four, but for now it suffices to conclude that **Consciousness is Energy in Time in Space**. And that that determines the way we think, act, feel and are, in everything we do. By including (our) consciousness in our equations, we are no longer lost to reality, nor that realisation to us. STEC is simply the simplest 'equation' in which that can be shown.

- ❖ **Consciousness**, determines the change of Field coherence; or Phase correlation. (This concerns Information organisation. Traditionally this was called Metaphysics; now, thanks to mathematics and physics, it is studied 'on its own' in Computing and as Information Science). Consciousness creates models which mimic/reflect us. Thus: 'Science' (and all models it presents) is the *mirror* of *our* thinking processes. (Thoughts ~ Patterns of Coherence.) These ideas have been expressed separately in the work on 4D Psychologies (O#o, 1999a).

- ❖ **Energy** defines the domains of coherence of phase (~ isovector fields): their correlations make the invisible (sub-atomic) visible. The Interference Patterns of Phase (in the dimension of Consciousness) create the arrays of (local) Phase Inversion, thus Boundaries. Such 'boundaries' determine the Possibility for discernment/distinction. By this the different forms of Energy (cf. Signal in noise, or gulf streams in oceans) are defined, which are perceived as patterns of coherence of change/transformations.
- ❖ **Time** is defined by the resulting (second order) Interference Pattern of Energy Dynamics. (~ fields of coherence/iso-phase of motion => patterns of reverberation as seen in 'processes'. Cf. The grouping phenomenon, due to phase shift <acceleration/deceleration> discerning Waves versus Wave Groups, versus Solitons.) "Time" is in this sense a kind of 'consciousness/phase wave envelope'; an iso-gradient 'topologic' line on an Energy contour map. It discerns Processes by the relationship of interaction/exchange (describable by the phase relationship in a Mathematical/physics sense).
- ❖ **Space** is but the consequential result of the orthogonalisation sequence/cascade; it represents a 3<sup>rd</sup> Order interference pattern. *Iff* there is dimensional coherence, & *iff* there is energy coherence & *iff* there is  $t_4$  coherence, *only then* is there structural coherence. (Often represented as  $\nabla^2\Phi = 0$ ; the "Laplace Equation" of "differentiation to stability".) 'Space' is thus the consequence of 3 consecutive (coupled) orthogonalisations (differentials/equations), described by physics as the relationship between Sub-atomic field, atoms, molecules and matter; and by Cosmology as the transitions from Big Bang (primordial Fire) => Gas Fire (Galactic Clouds) => Liquid fire (Suns) => Solid fire (planets).

Here the last (conclusion) is taken to be the first (starting point): *first* there is the (undefined) possibility for coherence [Consciousness], *then* the patterns of co-ordination [Energy], *then* patterns of synergy [Time], and *only then* "states" [Space]. Not the other way around.

Remark: Modern Science, in shifting her perspective from matter to molecules to atoms to sub-atomic fields, changed her perception from Physics to Chemistry to Electromagnetism and to Gravity; as a result of which the classical concept of 'Physical science' is now rather obsolete. What we know as physics is based on principles and interactions that are not physical themselves. As present-day Cosmology and the development of modern Physics show: reality is now seen to be based on the organisation in subatomic fields (Davidson, 1989). This (subatomic) **information Field** is the basis of the reality we know. Our models must account for this. We can no longer maintain that reality (our worldview) can be 'based on a physical/manifest/repeatable/quantifiable 'State' perspective. This "backward thinking", as science has shown.

It is the information, which *must* be understood, to be able to understand patterns of change of transmutations of reality. That is always intangible, non-repeatable/non-manifest/quality based. Thus Consciousness is decisive for the reality we know, not the

other way around.  $C \Rightarrow E \Rightarrow T \Rightarrow S$ . This realisation needs to be included into (our understanding of) the models we make.

## 5. The Application

Once the integration of Space-Time-Energy and Consciousness is seen (thus going beyond the integration of the unification of Space-Time in Relativity, or the interchangeability of Time-Space and Energy in Probability domains) much greater coherence can be obtained. It becomes possible to see limitations of the Second Law of Thermodynamics (which does not account for energy redistribution into and below the atomic domain, thus can not account for the rebound of the organisational boundaries involved) and the deeper implication of Information Science (and the reorganisation of organisational structures in the material domains). This makes it possible to regard matter as information, and inverse: information *matters* in creating the reality we know. This does however require a different way of thinking, in which recursion (the relationship between the part and the whole) is, explicitly, part of the model. It means that the model and the model maker are to be seen to be (aspects of) the same: reality and realisation are dynamically intertwined; the models of complex systems of e.g. rivers and their beddings can be applied to make this clear. At a deeper level it is seen in the interwovenness of Consciousness, Energy, Time and Space. Never is the one seen without the other.

## 6. Conclusion

Consciousness is the *essence* at the basis of the reality we know (O#o, 1993). It is from our Consciousness (Coherencing) [C], that Transformations [E], Variations [T] and Stability [S] are seen. This is how a person learns to experience reality: the undefined Unconscious creates awareness [C] of singularities [E], recursiveness in processes [T] (the subconscious) leading to a 'structured' [S] (conscious) realisation. While developing from respectively Baby to Child to Adolescent to Adult.

Structured ("Space"-based) 'Reality' is an artefact: it runs behind the facts (Latin: *facere* = to create). always. Literally: by studying "Time" *as if* based on "Space", it thereby inverts (thus denies) the findings of Cosmology, and ignores the principles by which 'Reality'/we came to be. 'Physical Science' extends that underlying confusion even more by then also defining "Energy" as 'a pattern in Time'. As a consequence it has no basis on which consciousness can be defined. (It 'erased' that basis by 'painting itself in the back-corner of the room'... Yet its models are valid still, if *only* understood in inverse.)

It is by *Consciousness* that our understanding of Energy is formed. It is **Energy** which then again defines our perception of Processes, thus **Time**. Which yet again conditions of 'structured knowledge' of **Space**. Cosmology showed that the undefined ('Big Bang') preceded the amorphous ('gas clouds'), from which came the fluid forms ('suns') and thence structures ('planets'). This is what Modern Physics concluded, having come from Classical {Space-based} science, to Relativity {Time processes},

Probability theory {Energy Transforms} and to Field theory (patterns of co-ordination); correcting its views every step on the way. If this is the basis of the reality we know, then we must learn to think in different ways (as shown by Gabor (refuting Euclid's Axiom 1), Labachev/Riemann (refuting Euclid's Axiom 5) and others)).

Consciousness is the basis of every description, theory, model or science we make. This must be made explicit. Every & any model is but a 'footprint in the sand' of the consciousness by which it was made. Alchemy and magic already understood this: what we think is what we experience. If we create bombs, we will live and die with them. If we study consciousness and health, then we will live with that.

All models we have are expressions of the consciousness by which they were made. By realising that they formulate, crystallise, condense our Realisation, not Reality, the basis of conflicts can be resolved. They can be understood as different states [S], processes [T] and perspectives [E] in consciousness [C]. Consciousness itself can then (again) be understood. (Showing that Objective Reality is a Subjective Realisation (a consensus in Languageing). Integrating Science with Religion, the Objective in the Subjective, as was the case already in the past, as described in the Veda of India.) By *seeing how we think and realising how we realise reality*, the process of 'understanding Reality' is brought back to 'understanding our understanding'. By this the effectivity, efficiency, aesthetics and ethics of our thinking can re-emerge. There is much more to say about this (which will be done in future work). The essence of the idea presented here is that Space  $\equiv$  Time  $\equiv$  Energy  $\equiv$  Consciousness. They are essentially (aspects of) the same, seen by different perspectives. With the understanding that  $S \leftarrow T \leftarrow E \leftarrow C$ , and that it is consciousness that we need to understand. In *all* the models we make.

All our models are false, as long as we don't know where they stop being 'true'; or why. If our models are unbounded, then so is our ignorance. What we need is a perspective on the integration of the Part in the Whole, *us* in the universe, *our* realisation in reality. Without the understanding of the relationship between the two, they are both unrelated; and the gaps (ignorance) between them will lead to conflicts (con-fusions) to. The wars and diseases are reflections of this. The remedy is found by restoring the integrity between the two; and by understanding **the role of the part in the whole**. Evidently it is not a Static 'thing'; and the models of Classical Science won't hold. Also, it is not a steady process, and thus goes beyond the scope of the model of Relativity (beyond the speed of light). Likewise it is not a conditioned Catalysis, and Quantum Theoretical concerns don't apply. It is embedded in the relationship between those three, how the Part reflects and complements the whole. At this point, science and mysticism are quite the same. They describe the same essence, in different ways. We can see that by realising that *all* our models of Reality, are fruits of Realisation (including all those findings that are forgotten, denied and ignored). It is then also evident that *all* disciplines of science, mysticism, commerce and the arts, are expressions of the same. They are all models of/for the expressions we have of/for the experiences we make. This is an interactive (and recursive) transformation process state always. "**Consciousness**" can be defined by this..

Consciousness is thus quite the 'same' as the reality we see, and our models of Energy displays the principles by which it works. The processes in Time represent the fluctuations to which it responds. The structures in Space, the coherence it can create.

This makes it possible to understand the 'models of Reality' as 'models of our own Mind'. E.g.: What has been studied in the form of the rivers and their bedding, can be understood likewise for our Minding and/of our Mind. By making this explicit, the flaws in the Process processing itself can be detected and resolved. (This is definitely a boon for a model like this in times like these where 'Science' gets close to destroying more than it creates.) By recognising the role of the part to the whole (Starkermann, 1996), a reconnection is made between cause and effect; linear and circular, and the scientific objectivity seen to be a subjective state, in which the collective and the individual need to recognise their mutual roles.

STEC, by offering a cognitive basis for a precise mathematical physical formulation of our logical processes of mind, provides a connection between our reality and our realisation, by which our flaws in Realisation can be understood. (And Systems Theory is one of the rare forms of science where learning can be done from mistakes.) In this view even 'Metric' Space, 'Second' Time and Energy 'Force' are no different, but by the frames of reference by which they are seen. And can be used for the expression and gauging of Consciousness too. (Future work on Referon Analysis will make this more clear. The patterns of recursion in Reference, by which Consciousness can thus be defined, will be elaborated therein.)

Evidently the inclusion of consciousness, in the equations we make and use, has fundamental consequences. It will show how *quantitative* 'facts' are based on the perspective taken, and thus on the *qualitative* approach (and involvement) in the mode of perception itself. This has implications also on the communicability of 'facts' (O#o, 1999a): it will help to reconcile seemingly different 'facts' by making clear how the results were obtained. That is what science, already, aims to do. STEC simply helps to bring this out, by making it explicit and defined.

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