

**Towards a TD Hermeneutics: BtSM for Learning in the Perspective of  
Complex and Long-term Change**

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# Building the Scientific Mind

Context

Fragmentation

World

- poverty
- global warming
- energy
- water
- waste
- biodiversity
- violence

Knowledge Systems

Natural Sciences

physics

chemistry

biology

Social Sciences

economics

psychology

sociology

- Proliferation - disciplinary “big bang”
- “Two Cultures”

# TD Hermeneutics

poverty

global warming

energy

water

waste

biodiversity

violence



**Complex world with complex problems**

➤ **interconnected global-local problems**

➤ **irreversible long term consequences**

➤ **facing consequences of our *own* fragmentary thinking and actions**

## TD Hermeneutics

**What if, we don't 'see' the planetary consequences of our fragmentary actions and thinking, well then .....**



# TD Hermeneutics

..... OR



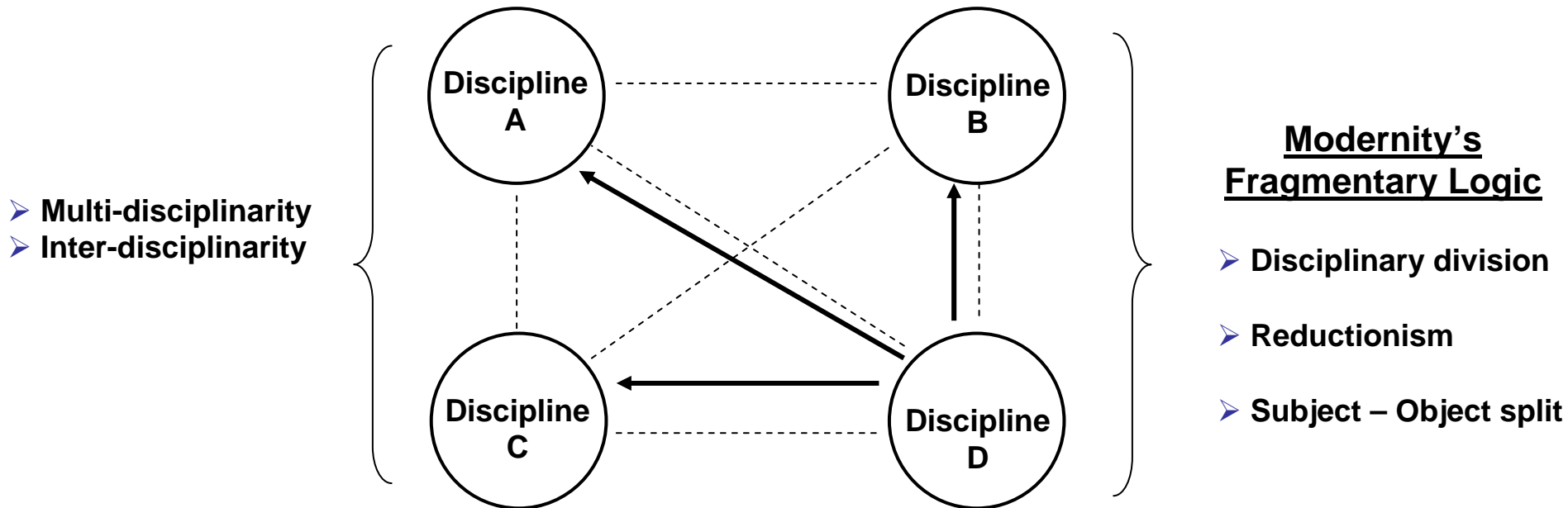
# TD Hermeneutics

## Points of Departure

1. Complex problems cannot be solved from a mono-disciplinary perspective [Nicolescu]
2. Cannot solve problems within the mindset that created them in the first place [Einstein]
3. Complex problems warrant complex thinking [Morin]
4. Complex problems / problematiques clearly constitutes a TD challenge [Max-Neef]

**Mono-disciplinarity = Modernity**

**Renaissance - general knowledge-areas**

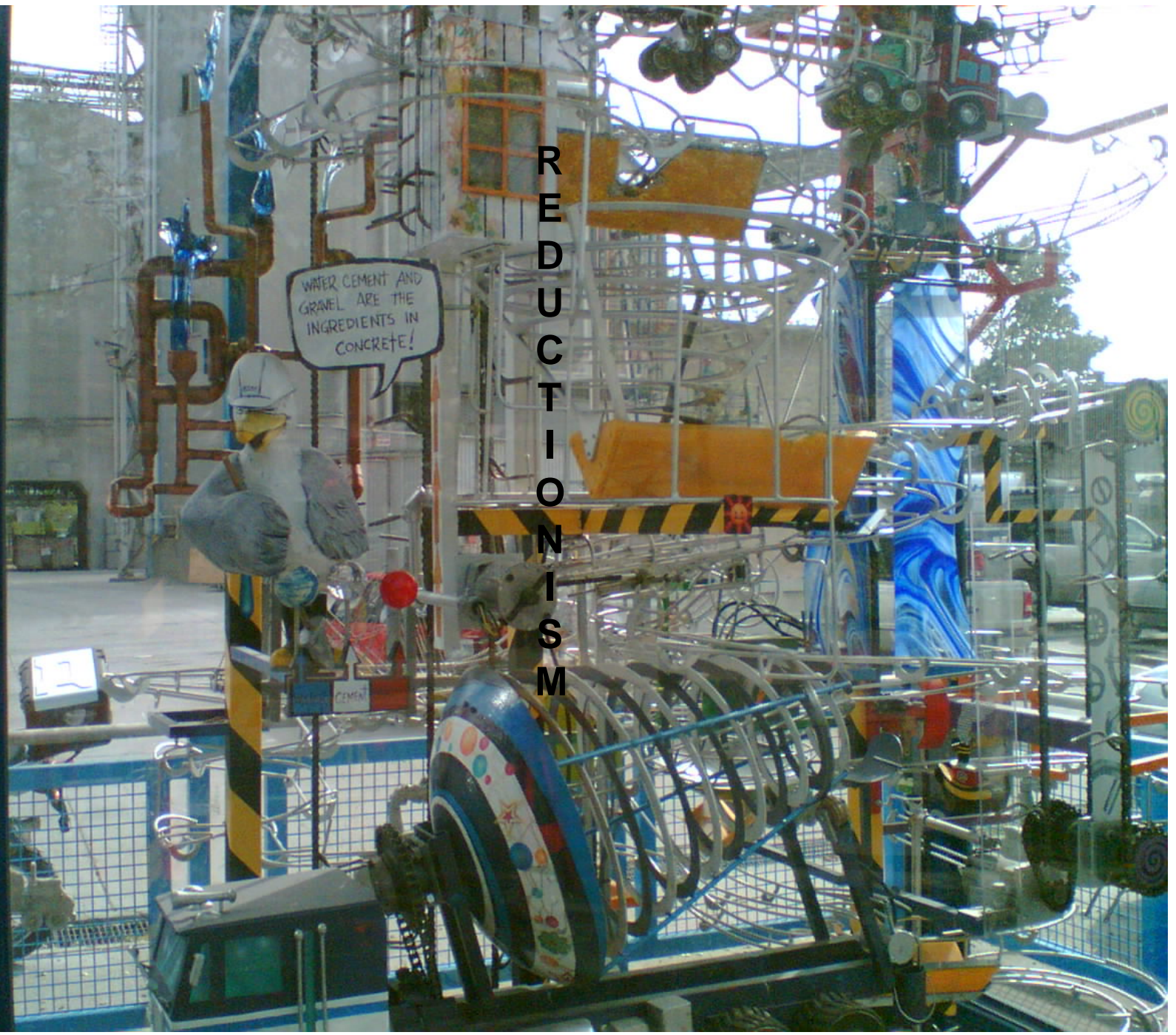


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WATER CEMENT AND GRAVEL ARE THE INGREDIENTS IN CONCRETE!



CEMENT



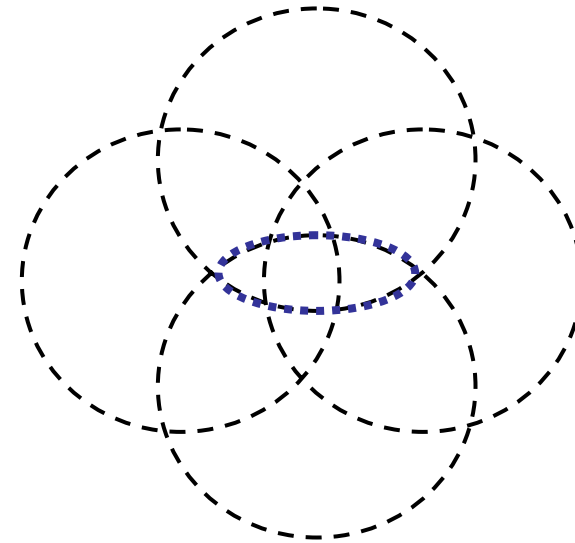
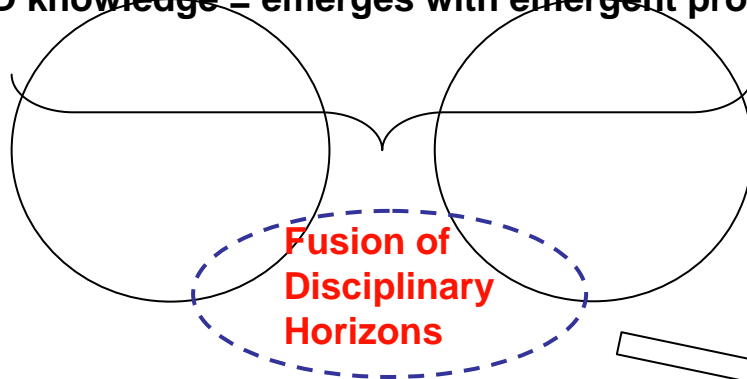
# TD Hermeneutics

As the prefix *trans* indicates, **transdisciplinarity** concerns that which is at once between the disciplines, across the different disciplines, and beyond all discipline. Its goal is the understanding of the present world, of which one of the imperatives is the unity of knowledge. [Nicolescu]

## Disciplinary Divide

### Bridging the Disciplinary Divide

- Disciplinary boundaries = porous [cells]
- What happens? Conditions?
- What is trans-ferred / trans-formed?
- TD knowledge = emerges with emergent properties



### Framework for BtSM

- complexity
- long-term change

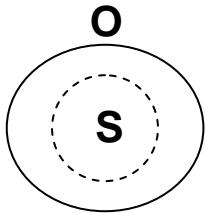


# TD Hermeneutics

- What is the ontological-epistemological basis for this 'fusion of disciplinary horizons'?
- Subject – Object relation?

## Other conceptualizations / representations:

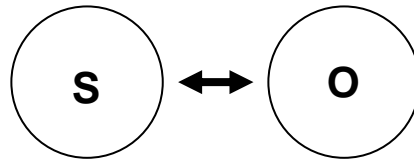
### ➤ Pre-modernity



= Absorption

[animism]

### ➤ Modernity



= Severance

[Idealism /  
rationalism]  
vs.  
[positivism /  
empiricism]

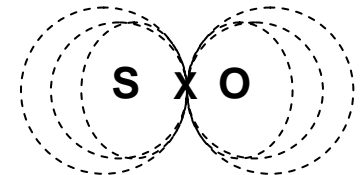
### ➤ Post-modernity



= Abolition

[deconstruction]

### ➤ Transdisciplinarity



= Affirmation

[complex unity]

# TD Hermeneutics

## ➤ Multi-dimensional Ontology

### Ontological / trans-subjective definition:

..... insofar as Nature participates in the being of the world, one must give an ontological dimension to the concept of reality ..... Nature is an immense, inexhaustible source of the unknown which even justifies the existence of science ..... 'reality' is not merely a social construction, the consensus of a collectivity, or some or other inter-subjective agreement ..... [Nicolescu, p.20]

### Pragmatic definition

.... by Reality' (with a capital R) we intend first of all to designate that which resists our experiences, representations, descriptions, images or mathematical formulations ..... [Nicolescu, p.20]

### Levels of Reality

.... by 'levels of reality' we designate an ensemble of systems that are invariant under certain laws .....

.... for example: quantum entities are subordinate to quantum laws, which depart radically from the laws of (macro) physical world .....

.... that is to say, that two 'levels of reality' are different if, while passing from one to the other, there is a break in the laws and a break in the fundamental concepts (such as between 'local causality' and 'global causality, for example) ..... [Nicolescu, p.21]

# TD Hermeneutics

## ➤ Multi-referential Epistemology

### Continuity on same 'level of reality' [horizontal]

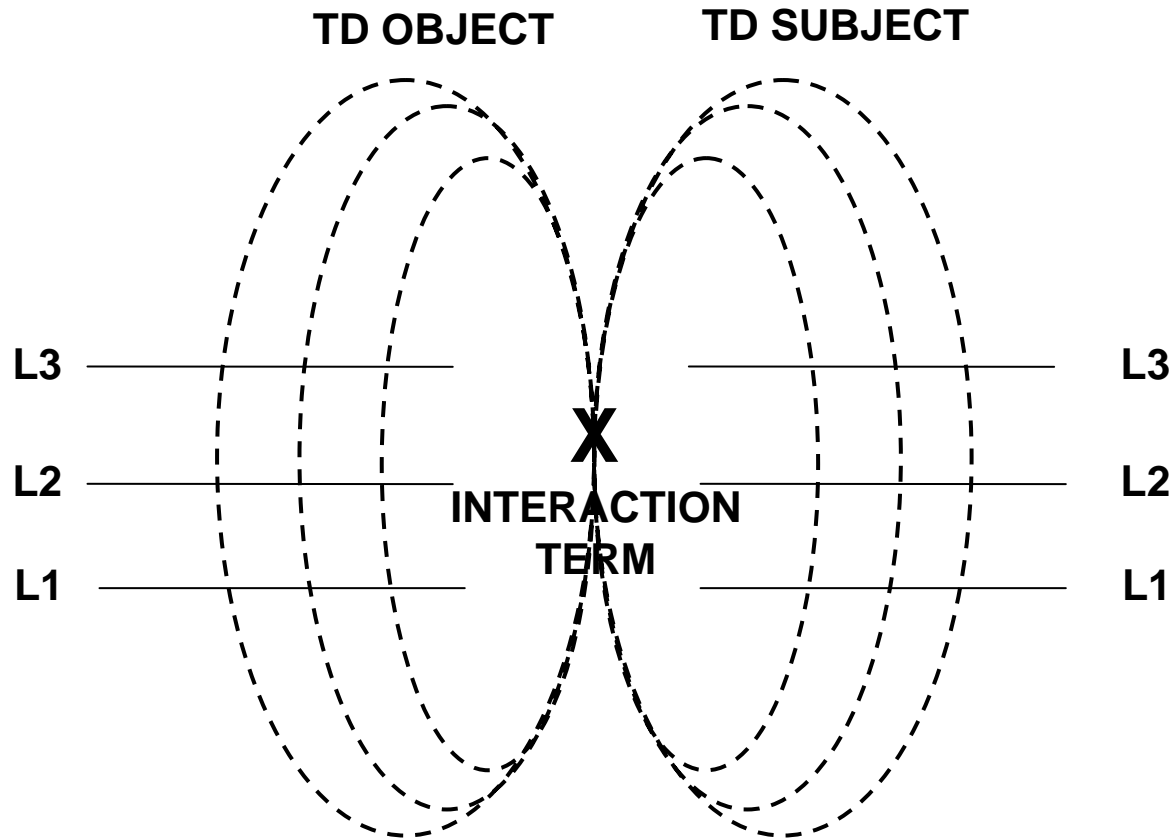
The different 'levels of Reality' are accessible to human knowledge thanks to the existence of different levels of perception, which are found in a one-to-one correspondence with levels of Reality [Nicolescu p. 55]

The harmony of the transdisciplinary Subject and the transdisciplinary Object is linked to the harmony between the levels of perception and levels of Reality. [Nicolescu, p. 71]

### Dis-continuity between 'levels of reality' [vertical]

Similarly, as there are fundamental 'ruptures' or 'breaks' between one 'level of reality' and another level, so we find radical breaks between levels of perception ..... In other words, we cannot use the concepts, images and representations of one level to understand another level.

## COMPLEX UNITY OF SUBJECT - OBJECT



### **NB Conclusion**

- In respect of the multi-dimensional structure and perceptions of Reality, the Subject – Object relation is **AFFIRMED** by its **COMPLEXITY** [simultaneous *continuity* and *discontinuity* between different levels of reality]

# TD Hermeneutics

Question: how can something be *continuous* and *discontinuous* at the same time?  
How can something simultaneously be a *wave* and *particle* ? Does this not constitute a logical problem – a contradiction in terms?

Such pairs are considered contradictions in terms of classical Aristotelian logic:

1. The axiom of identity: A is A.
2. The axiom of non contradiction: A is not non-A.
3. The axiom of the excluded middle: There exists no third term T, that is simultaneously A and non-A.

# TD Hermeneutics

## ➤ Logic of the Included Middle 'T'

1. The axiom of identity: A is A.
2. The axiom of non contradiction: A is not non-A.
3. **The axiom of the included middle: there exists a third term T, which is *at the same time* A and non-A.**

“Our understanding of the axiom of the included middle, that there exists a third term T, which is *at the same time* A and non-A – is completely clarified once the notion of ‘levels of reality’ is introduced .....

“ .... It is the projection of the T-state onto the same single level of reality that produces the appearance of mutually, antagonistic pairs (A vs. non-A). A single level of reality can only create antagonistic oppositions ....”

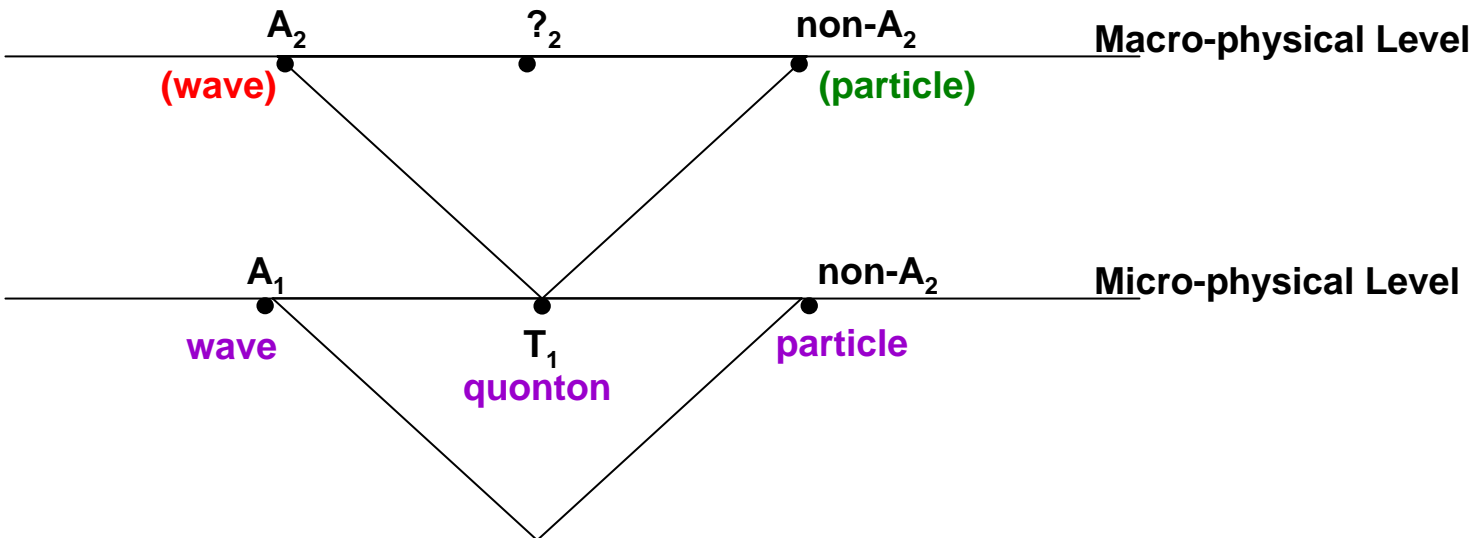
“If one remains at a single level of reality, all manifestations appears as a struggle between two contradictory elements (e.g. wave A vs. corpuscle non-A) .... the third dynamic, that of the T-state, is exercised at another level of Reality, where that which appears to be disunited (wave vs. corpuscle) is in fact united (quoton) .....

[Nicolescu, pp. 28 – 30]

# TD Hermeneutics

## ➤ Logic of the Included Middle 'T'

“... the three terms (A, non-A and T) can be represented by a triangle in which one of the vertices is situated at one level of Reality and the other two vertices at *another level of Reality* ... the included middle is really an included third ....



# TD Hermeneutics

## ➤ Logic of the Included Middle 'T'

### SUMMARY

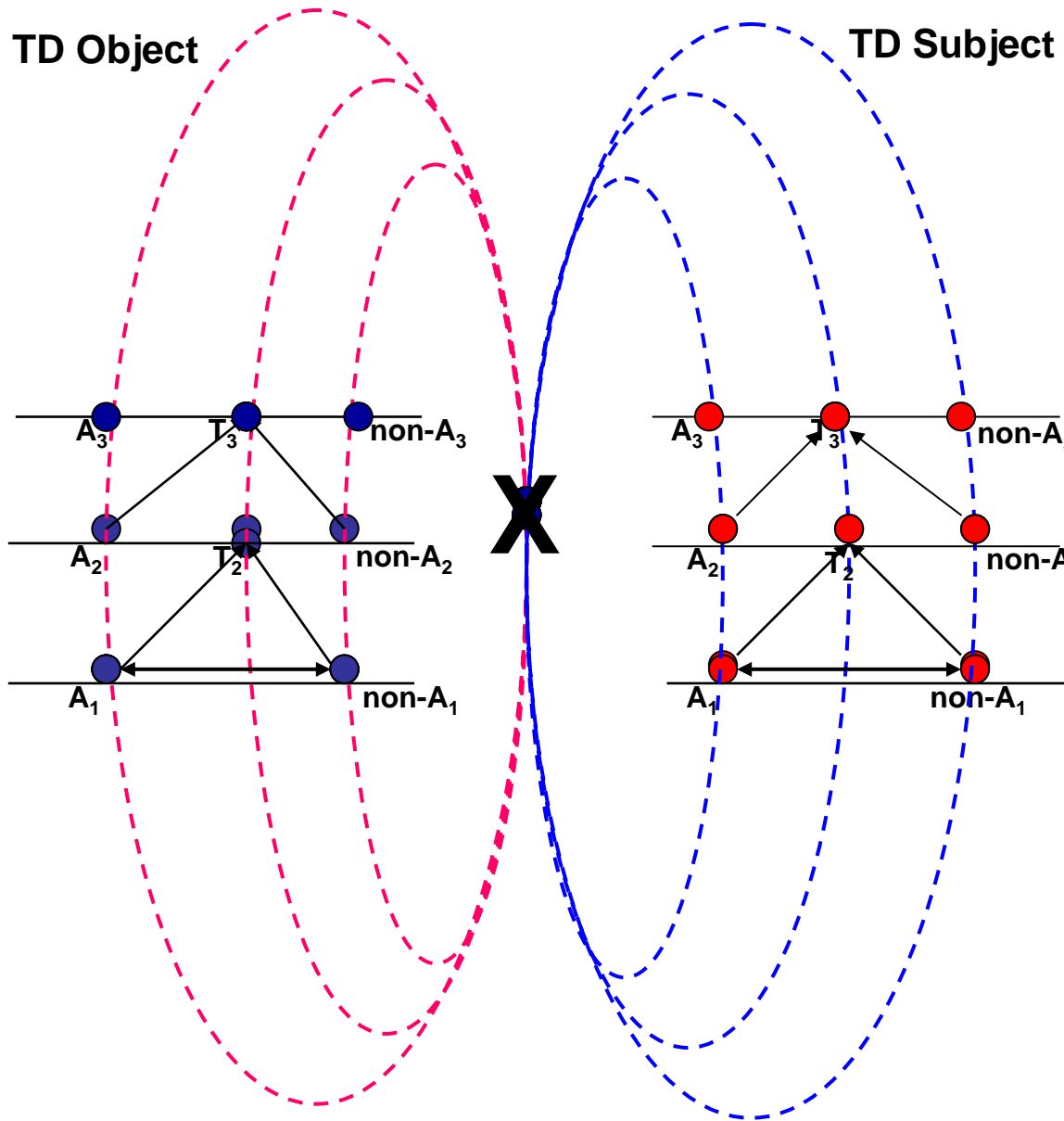
“...the logic of the included middle is not simply a metaphor ..... it is perhaps the privileged logic of complexity; privileged in the sense that it allows us to cross the different areas of knowledge in a coherent way .....

.... the logic of the included middle does not abolish the logic of the excluded middle: it only contains its sphere of validity – to that of the macrophysical ‘level of Reality’ ”

[Nicolescu, p.34]



# Complex Unity



# TD Hermeneutics

## NB Hermeneutical Concepts and Approaches

- Introduction: earlier referred to bridging the disciplinary divide as 'fusion of disciplinary horizons'
- this notion of a 'fusion of horizons' taken over from the dialogic hermeneutics of Hans-George Gadamer
- now, need to demonstrate that what can be imagined at the ontological-epistemological level of our thinking, can be extended into the arena of a trans-disciplinary dialogue and disciplinary boundary crossing
- in other words, what is needed is the integration of the key hermeneutical concepts associated with the notion of 'fusion of horizons' and the three axioms of TD [levels of reality, complexity and included middle]

# TD Hermeneutics

## NB Concepts and Approaches

### NB of Contextuality

- contextuality does not only refer to the Object and the complex nexus / system of relationships of which it is part and parcel
- contextuality also refers to the temporality or historicality of the Subject's position when interpreting and understanding the Object
- 'understanding' is never a-temporal – we do not have access to a transcendental vantage point from which to interpret reality – when in the present, the past and future are always present
- therefore, 'understanding' is never value-free / presupposition-less

# TD Hermeneutics

## NB Concepts and Approaches

### NB of Contextuality

- however, this impossibility of value-free interpretation does not render the possibility of ‘understanding’ *per se* impossible
- ‘understanding’ happens because of the presence of our assumptions and presuppositions – not because of their absence
- ‘understanding’ occurs when there has been a meeting or ‘fusion’ of the assumptions and presuppositions underpinning our ideas
- ‘fusion of horizons’ – implies ‘new’ understanding – fundamentally different understanding emerges between those in dialogue with each other – seeing the matter (Sache) under discussion in a completely different light to how it was understood before entering into dialogue

# TD Hermeneutics

## NB Concepts and Approaches

### Fusion of Horizons – Disclosure and Dialogue

- For a fusion of horizons to take place it is necessary that there is both ‘disclosure’ and ‘dialogue’ between the Subject and Object
- ‘Disclosure’ means ‘laying open’ – the Subject can only ‘hear’ / ‘see’ what the Object wants to say if it is open / willing for such dis-closing
- when entering into dialogue with the Object, the Subject acknowledges the limitations / finitude of its own disciplinary knowledge – no access to absolutely certain transcendental / *a priori* knowledge categories or principles which can only to be confirmed by the Object [Descartes / Kant]

# TD Hermeneutics

## NB Concepts and Approaches

### Fusion of Horizons – Disclosure and Dialogue

- Subject focuses not only on what has been said *by* and *about* the Object, but focuses also on what is NOT been ‘said’ / ‘heard’ – in so doing, the Subject allows itself to become conscious of the assumptions underlying its disciplinary knowledge, ideas, concepts and representations of reality
- Reality (object) is always more complex than our ideas and will always resist our concepts, notions and representations – awareness of the assumptions and limitations of disciplinary knowledge is critical in this process of resistance – we will only be able to ‘feel’ or experience this resistance if we know that we do *not* know – if we become aware of the assumptions and limitations of our extant disciplinary knowledge
- ‘disclosure’ happens at a critical point in dialogic process when the ‘zone of non-resistance’ has been reached – when, at a particular level, Reality offers no more resistance to our ideas and representations – when there is a meeting point [X] between our ideas and what Reality has dis-closed *to* us

# TD Hermeneutics

## NB Concepts and Approaches

### Fusion of Horizons – Suspension of Assumptions

- David Bohm [On Dialogue] concurs with notion that ‘understanding’ takes place because of the presence of our assumptions – not because of their absence
- Bohm’s notion of ‘suspension’ of assumptions is very NB part of a trans-disciplinary dialogue
- once we have become aware of our assumptions, we can ‘suspend’ them – we do *not have to* ‘act on’ them – either confirming or denying them – can be held in abeyance – holding them in front of us whilst busy exploring other ideas – a holding space for the tension between resistance and non-resistance
- are we dealing with a new ‘level of reality’? Are we on the brink of a break-through, a new understanding? Or, are we just looking at the complex problem(s) from another disciplinary perspective? Are we about to transcend our disciplinary boundaries, or are we somewhere between the multi – and inter-disciplinary modes?
- ‘suspension’ creates very NB intellectual space in a trans-disciplinary dialogue

# TD Hermeneutics

## NB Concepts and Approaches

### Fusion of Horizons - Paradigms

- assumptions play NB part in the formation of our paradigms – the way we look at and understand the world – they are strongly embedded in our worldviews – tacit dimension – exercising a ‘moulding’ effect on how we see things
- the scientific mind and scientific communities are not ‘free’ from this paradigmatic effect – paradigms are not only associated with everyday life and non-scientific communities
- although paradigms exercise a strong influence on our understanding of the world, it does not mean that they cannot be changed – paradigmatic change does not always occur linearly, but more than often abruptly / disruptively



# TD Hermeneutics

## NB Concepts and Approaches

### Fusion of Horizons - Paradigms

- such 'revolutionary' paradigmatic changes (T. Khun) are associated with fundamental breaks in how the world has been perceived previously – when there has been a complete change and displacement of previously strongly held views and assumptions [quantum physics]
  
- Question: what type of assumptions constitute our worldviews and paradigms?
  
- At least 8 categories: -
  - ❖ cosmological .....
  - ❖ ontological .....
  - ❖ epistemological ....
  - ❖ logical ...
  - ❖ theoretical ....
  - ❖ methodological .....
  - ❖ anthropological .....
  - ❖ axiological .....

# TD Hermeneutics

## NB Concepts and Approaches

### Fusion of Horizons – Knowledge–Power Relation / Production of New Language

- Should we see the process of TD dialogue as ‘free’ from contestation? Is this a ‘smooth’ process ‘free’ from the reality of power struggles?
- If we associate ‘power’ with ‘repression’ and a ‘will-to-dominate’ only, difficult to associate ‘listening’, ‘hearing’ and ‘openness’ to the dis-closure by the Object with the notion of ‘power’ [Bacon]
- However, if we understand by ‘power’ a productive will-to-know – power producing knowledge – it is perhaps not too difficult to associate the ‘resistance’ and ‘counter-resistance’ of our ideas with that of a RIGOROUS dialogue
- Where the discovery of new ‘levels of Reality’ and paradigmatic change is at stake, it becomes necessary for ‘old’ ideas and concepts to be ‘re-placed’ with a new language, new ideas, concepts, representations – signifying a fundamentally new understanding
- However, such ‘re-placement’ is not ‘repression’ and ‘annihilation’ – it is ‘restricting’ the old ideas, concepts and language to its ‘level of reality’ and sphere of influence – nevertheless making way for the birth of a such new thinking, with new ideas, concepts and language

# TD Hermeneutics

## Conclusion

**We are living in complex and unsustainable world with far reaching consequences for our continued existence on Earth. To meet the challenges facing us all, irrespective of our race, class, gender, status, religion, location, we need a 'scientific mind' capable of 'thinking the complex', which can both respect *and* transcend the disciplinary boundaries. Remaining in our disciplinary silos is not an option. An ongoing trans-disciplinary dialogue is essential if we hope to find durable, long-term and holistic solutions for the future.**



**Our Only Home .....**