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A Few Notes on the "*Field of `Between´*": The "*Field of `Between´*" as a Core Concept of the Interdisciplinary Dialogue

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A Few Notes on the "*Field of `Between´*": The "*Field of `Between´*" as a Core Concept of the Interdisciplinary Dialogue

Hisaki Hashi

Introduction

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1. The original source of the Field of `Between´

This idea has evolved out of the theory of quantum physics: In the basic version of the double-slit experiment (first designed by Niels Bohr) an elementary particle (light quantum or electron) is directed towards a screen. Two plates, one with a slit, the second with two slits, are placed between the source of emission and the screen. This experimental arrangement makes it possible to observe whether the emitted light quantum passes through the slits in the form of a particle or as a wave in the interference phenomenon. Even with the latest state-of-the-art measuring equipment results will differ according to the type of the test assembly. There is no clear definition – not even with the help of experimental calculation – whether the emitted quantum is detected as a light particle (discrete) or as a light wave (continuous). Pietschmann has explained this fact as follows: *The nature of the elementary particle is created or produced by the measuring apparatus.*[2] Whether it appears as discrete or continuous is established only with measuring and recording. I have found the following definition in the light of natural philosophy for this ambiguous phenomenon, which seems to contradict traditional physics - one of the most rigorous natural sciences: Whether the quantum is recorded as a discrete particle or as a continuous wave depends on the **"Field of *Between*"**, on the space between the emitted light quantum and the light-sensitive receptor. In terms of theoretical physics the fact may be described as follows: The "Field of *Between"* is the ***topos of the interaction of matter*** of two physical beings.

2. "The Field of `Betwwen´" as a topos of interaction

Is the "Field of *Between*" simply the same as "physical interaction"? Seen from a purely physical point of view, the term "interaction" should suffice. Any further elaboration would belong to the humanities. However, I think that the "Field of Between" is a central concept of natural philosophy, not simply one of physics. It is an interdisciplinary concept which, based on natural science, stimulates philosophical reflection about the true being *(ontos on)*.

In observing a physical interaction the observer meticulously supervises a given physical event (i.e. the exact isolated localisation of an emitted light quantum), which is recorded by the receptor. In ***natural philosophy*** another horizon of thinking and reflecting is open for the same event: **The physical observer is also embedded into the whole phenomenen of conducting the experiment**. Therefore his viewpoint of physical objectivism is bound to the measuring equipment. The person who measures and observes is a representative of a "rigorous physical objectivism"; he touches the object to be measured in a micro-world, thereby causing a diffusion of the measured object: the Heisenberg uncertainty principle. In his thought experiment about the measured value of the diffused electron, its position value and its impulse value at the so-called Compton scattering effect, Heisenberg established his uncertainty principle within the framework of the mathematically proportional ratio. The individual values of position and impulse cannot be defined with due precision.[3]

From the angle of natural *philosophy*, the basic fact of quantum physics contains the following problem: The "observer interferes with the micro-phenomenon of the measured object". This means the observer, together with his physical, rigorous, objectivist observation, enters the ***"Field of Between"***, i.e. the ***topos of physical interaction***. This appearance of the whole may be reflected in the light of natural philosophy as follows: We, as supervisors, wish to clearly observe and reference the given entirety of the exact measuring

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process, its effects and the diffusion of the measured object. The action of the "supervisor" intervenes with the *"Field of Between", in the field between the physical measuring phenomenon and the philosophical phenomenon of critical reflection".*

3. What is New in this Key Concept of the "Field of Between"?

A leading theoretical physicist of the Tokyo University says that the essential characteristic of this idea is that the thinking person himself/herself is 'enclosed' in the object under consideration or in the phenomenon of the problem under discussion. He thinks that this is an essential nucleus of natural *philosophy*, which cannot be supplied by natural *science*. – I would comment as follows: Let us say, if we have to fall together with the "apple falling from the tree", we cannot derive any mathematical formulas for the law of gravitation. If we fly together with the "flying arrow" in Zeno's arrow paradox, we cannot evolve any concept of thinking which would show a basic model of the development of differential calculus. – This kind of a clear *distance, given by us as thinking subjects facing the object of thought*, would "certainly be typical and useful for the development of modern rationalism and natural science", says another colleague, sociologist at the University of Vienna. The theoretical physicist of the Tokyo University comments as follows:

„Yes, one can say this in general: The *"Field of Between"* means that we, as we reflect, *move* within a given problem area, in critically defining our "human existence" as thinking persons as object of our reflection. This way of looking at things is not unfamiliar to the so-called non-occidental, non-European or East Asian philosophy. We feel a certain proximity with such an orientation in thinking and observing, we feel that in spite of supervisory rationalism and advanced technologies we are nevertheless *part of nature."*

I should like to add: This subject-object-relation, in which the thinking person as a cognitive subject, with his human existence as a whole, lets embed himself into the *problem field and critically moves together with the problem under consideration,* is largely unknown to the basic principles of analytical philosophy. Moritz Schlick, for instance, said in his lecture "Problems of Philosophy" ("Probleme der Philosophie") of the Vienna Circle of the first generation in 1933/34 that a clear-cut split of cognitive subject and cognitive object was a primary basic condition for formulating any cognitive theory.[4] If this prerequisite is lacking any discourse will be lost, it will turn into mere intuition or subjectivist sensation. By contrast, the *"Field of Between"* as a core concept of scientific theory is justified, for the following reason: *A cognitive subject, equipped only with the classical method of analytical thinking, with this orientation "excluding any intuition", turns in on the issue under consideration, where data capable of analysis have priority. Out of this, another* "half-world" will arise, as a result of the excluded, subjective data that do not lend themselves to analytical presentation, a world that may show itself as a kind of subjectivity of analytical centrism.[5]

4. The "Field of Between" as core concept of the cosmological principle

The role of the *"Field of Between"* as core concept of the cosmological principle is discussed in the following:

a) In measuring a micro-object the observer switches himself into the given field of the micro-being, together with his act of observing. He switches himself into the *"Field of Between"*, into the *topos* of *interaction of himself and the micro-object*, thus gaining a measuring result.
b) In the phenomenon of the *meso-world* the idea of the *"Field of Between"* can be visualised as follows: Let us assume a prism (as conceived by Newton). Light passing through the prism causes the phenomenon of seven different colours due to their different wavelengths. Light in nature has from the very beginning – before any measurement (also in the sense of Kant's pure reason *a priori*) - contained the seven colours, but what was hidden has been made visible only by intervention of the prism.[6] In the *"Field of Between"* this would mean that the seven layers of colour are created in the topos of interaction of light and prism, while we, as observers, switch ourselves into this field of interaction together with our visual power. The *"Field of Between"* engulfs us as observers. while we scientifically record in our conscious mind the values of the different wavelengths.
c) In the phenomenon of the macro-world the *"Field of Between"* can be noted as follows:

In tidal dynamics, the seawater level on earth is raised by the co-action of different physical forces:

1) by the gravitational force of the moon,
2) by the centrifugal force of the rotation of the earth and
3) by the proportional co-action of the lunar and terrestrial forces (in the rotation of the moon-earth system).

This happens not only on the side of the terrestrial globe which faces the moon but also on the reverse side, because of the centrifugal force of the rotating earth: In these areas the seawater level rises – it is high tide. There is low tide in the other areas – while the total volume of seawater on earth remains constant.[7]

Hans-Dieter Klein has given a nature-philosophical description of this natural phenomenon in his system theory writings: [8] The moon, together with its gravitational force, affects the lunar-terrestrial system. In analogy to a "measuring apparatus affecting the macro-phenomenon" the moon, together with its macro-

presence, may be said to *measure*, i.e. to regulate the tidal dynamics of the earth.

In the "Field of Between" this action may be described as follows: The tidal dynamics occur in the gravitational field of moon and earth, accompanied by the centrifugal force of the rotating globe. Out of the interaction of the two macro-systems there arises the tidal movement in the *field between the moon and the earth.* We, as thinking persons, *switch ourselves into this "Field of Between", between the moon and the earth*. In this our meso-world human existence is enclosed in the macro-phenomenon, *our body consisting of an aggregate of micro-world particles whereas we can at the same time enclose the macro-cosmic whole into our minds.*

5. The Field of Between as a principle of interdisciplinary interaction

In interdisciplinary discourse, experts of different disciplines may often have widely differing concepts and interpretations of one and the same term. Even within one discipline, such as philosophy, such a phenomenon occurs when representatives of different historical schools or experts from different philosophical sub-disciplines meet for discussion. This may lead to endless misunderstandings, in which different concepts are linked together in an erroneous way.[9] The consequence may be a one-sided public "declaration of victory" or a one-sided "presentation of absolutism or centrism" of one's own discipline.

This type of debate developed untill the end of the 20th century, and even after the turn of the millenium in some world regions this type of "ego-absolutism or ego-centrism" is still working, accompanied by falsifications, erroneous interpretations and misguided developments.

I think that the basic idea of the *"Field of Between"* is able to provide a meaningful contribution towards correcting this undesirable development, with regard to a preliminary orientation of interaction in the field of interdisciplinary.

A fundamental prerequisite in the traditional interdisciplinary scientific communication is that two experts – the I and the You – represent their own, closed worlds, clearly separated from each other. In this "dialogue" either side represents a closed system "without windows". In a positive sense, this means a confirming of one's own system and offers plausibility for self-reference in the theoretical discussion. On the other hand, this has a negative effect, leading to a rigidity in thinking and a limited visualisation of truth, which might suppress and defeat any potential for the expansion of knowledge. In the name of reason a person can undertake the opposite, sure of himself, whereby his intelligence exclusively and endlessly furthers his own powers in an uncritical justification of his own knowledge. An opening for communication, interaction and for an exchange of interdisciplinarity is thus destined to fail.

The aim of the concept of the "Field of Between" is not at all that the thinking person falls into an intermediate field in an undifferentiated sense. The aim of the "Field of Between" is not simply to group all differences together, to add them and to position oneself, as the case may be, safely "between" different hypotheses. What is important is a totally different aspect, namely that experts with different basic knowledge and ideas may deliberately establish a topos of intra-action and intra-relation between themselves and their partners in discussion. This intermediate zone is suitable for correct intervention, argument and taking up the opposite position. At the same time it is a real "Field of Between", which makes possible a mutual rapprochement, "reconciliation" and mutual amalgamation as "intra-action" and "intra-relation". If this key idea with an integration of two opposites is absent, then any topos of interdisciplinarity is bound to fall into the *"Field of Isolation"* or *"Field of Levelling Relativism"*.

The aim of realizing the "Field of Between" is a ***clarification of differences, a culture of dialogue, an integration of opposites and the emergence of new ideas arising out of this***. In view of the latter aspects the *"Field of Between"* is a model useful, if not indispensable also for educational science.

Notes

1. H. Hashi, *Naturphilosophie und Naturwissenschaft - Tangente und Emergenz im interdisziplinären Spannungsumfeld,* Münster/ Berlin Zürich/ London/ Wen 2010: LIT.
2. H. Pietschmann, Quantenmechanik verstehen, 2003, 5.1. Das Doppelspaltexperiment.
3. Heisenberg, Physikalische Prinzipien der Quantentheorie, Mannheim/Wien/Zürich 1991, Chapt. II.2., p. 16ff. Recent experimental physical research affirms that the "uncertainty" of position and impulse values can be measured more precisely. This results in a renewal of the formula of the Heisenberg uncertainty principle, as it has been known up to now, in the field of theoretical physics. Cf. *Nature Physics, 2194*, 15.01.2012, authors: J. Erhart, S. Sponar, G. Sulyok, G. Badurek, M. Ozawa and Y. Hasegawa. The historial importance of Heisenberg's discovery of the "uncertainty" of measuring micro-objects remains unaffected.
4. M. Schlick, Die Probleme der Philosophie in ihrem Zusammenhang, Frankfurt a.M. 1986, chapters 8, 21, 22.
5. Cf.. Hashi, „A n den Grenzen der Cognitive Science und Philosophie. Zur Bedeutung der Willensfreiheit", in the present collective volume.
6. Nishida, Collected Works, Vol. 11, Tokyo 1965, p. pp. 62-63.

7. Hashi, „Das ‚*Feld des Zwischen'* als Leitidee der Naturerkenntnis –Mit besonderer Berücksichtigung der Philosophie der ‚*Leere'*, Chapt. 3, in: Hashi, *Naturphilosophie und Naturwissenschaft. Tangente und Emergenz im interdisziplinären Spannungs-umfeld,* Münster/Berlin 2010, p. 192-193.
8. H.-D. Klein, „Systemtheorie und Monadologie", in: Klein, *System der Philosophie* Vol. IV. *Ergänzungen zur Kritik der Vernunft,* Frankfurt a.M. 2003; in: Systemtheorie, K. Gloy and H.-D. Klein, Bonn 1998.
9. „Davoser Disputation zwischen Ernst Cassirer und Martin Heidegger", in: Heidegger, *Kant und das Problem der Metaphysik*, Anhang, Chapt. IV, Frankfurt a. M. 1991.