Meeting of the International Society for the History, Philosophy and Social Studies of Biology, 16 – 20 July, Vienna 2003.

Metaphysics in Physics and Biology

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"Everything that can be said can be said clearly". This statement by the Austrian philosopher Ludwig Wittgenstein sums up his agenda very precisely and underlines the fascination he exerted on the logical empiricists: to have found a language that would enable an equally clear description of observations as it would a clear construction of a theory. "Wittgenstein's razor" reflects the good tradition of "Occam's razor", and the intentions were similar in both cases: to distance oneself from untestable, speculative, dogmatic, poetic statements, to be able to clearly delimit oneself from "pseudosciences" such as theology, philosophy, poetry and all their subdisciplines.

This was made possible by the postulate of the identical logical form of mathematicizable formal language and depictable facts, i.e., the definite corre-lation between being and language. This can also be expressed in systems theoretical or constructivist terms: the hierarchy of interlinked brain cells that achieves self-awareness. Thus, according to Wittgenstein, nothing sensible can be said about the logic of this language. It merely represents the tran-scendental precondition for all meaningful statements.

How the story ended is well known: by laying claim to the ultimate explanation, logical empiricism unmasked itself as metaphysics and was, tragically, unable to reflectively assure itself of this because of its self-imposed metaphysics ban.

Wittgenstein himself was the first to recognize this and drew the radical consequence. He disproved the pseudometaphysics he had developed in his early work "Tractatus logico philosophicus" and threw open the doors to a new world – to an understanding of the transcendental preconditions for human language. He showed that everyday language is the ultimate of all possible metalanguages because humans, as social organisms, socialize and coordinate their activities in and with it. Luxury developments such as scientific thought, theory formation, etc. are secondary language applications that borrow their words and terminology from everyday language and burden them with consensually determined, new meanings.

The dismay of the logical empiricists was great. They had placed their bets on Wittgenstein – so convinced were they of the possibilities to set themselves apart, so enthusiastic were they about the opportunity to establish foundations for the exact sciences and about having pushed open the door to a new age of scientific progress.

The burial rituals were correspondingly protracted and difficult. The logical empiricists had become enmeshed in the illusion of all metaphysics, i.e., that one could imagine something in the real world that actually was the real world, independent of human language. The strategy in the natural sciences was to understand language from a behaviouristic or systems theoreti-cal perspective, as a vehicle for information and as an actual depiction of the facts.

In particular, the translation of observational language into theoretical language failed repeatedly due to the variably defined initial and framework conditions and, more specifically, the disposition terms, which do not lend themselves to unambiguous formalization. Moreover, the attempt to understand ourselves as part of the system, allowing us to recognize the system as an overriding ordering factor, merely confused our own language preconditions with an idealized external nature. Simply put: first understanding external nature, followed by mankind's understanding of itself and its language capabilities, i.e., shifting the subject of knowledge from human to non-human nature.

Instead of defending individual goals of logical empiricism, the trend was to increasingly abandon metaphysics entriely; ultimately even the issues themselves were discarded. The formerly highly praised verification criterion – designed to distinguish between reasonable and unreasonable scientific statements – was dropped because not all statements are verifiable. Karl Popper undertook a rescue attempt in the framework of critical rationalism and its central question: "What features do advances in knowledge exhibit and how can such advances be promoted?" This ran into similar difficulties. A good theory is one that contains as many statements as possible, that within itself bears the possibility of disproval, i.e., that is falsifiable. The more opportunities a theory provides to readjust its explanations, the more fruitful that it will be.

When confronted with the question whether this also applied to his own theory, Popper replied 'no', his theory was naturally exempt. Notwithstanding that this clearly represents a performative contradiction, the question is quite simply the acid test for pragmatism. It indirectly asks Popper whether he has settled in the realm of metaphysics, and Popper answers the question with 'yes'.

Delimiting the so-called exact sciences from metaphysics failed for two reasons. First, because the attempts ignored the own, inherent metaphysical roots. This removed the basis for critical reflection about underlying conditions. Second, no comprehensive language concept was available that could encompass all facets of scientific language, observational language and everyday language.

This is also valid for those scientific disciplines that leaned on – or made an effort to lean on – natural sciences to justify their topics and methodologies. Semiotics belongs in this group. It does not consider itself to be derived from the humanities and it excludes processes such as the understanding of statements. Rather, semiotics explains understanding behavioristically or systems theoretically in the sense of a traditional form of signal transmission – a transmitter-receiver code using an existing information channel. Even today, semiotics still deals with this solipsistic information transmission model in which the transmitter transforms his/her thoughts into language, which the receiver then fills with subjective thought content. Here, sign processes are mainly present in the form of syntactic-semantic structures whose pragmatic aspects are largely ignored. Logical empiricism's fateful entanglement in the methodology of the metaphysics is evident here as well.

At this point, a quick shift to the cradle of Western thought, to the days of Democritus, Pythagoras, to the pre-socratic period and the movement to-wards the constellation of Plato and Aristotle, to the very roots of all meta-physics.

The Eleatics mark the first decisive phase in our desire to use language to generate notions about the structure of all what exists. The goal is to determine the basis for being, which does not yet exist, but the basis from which all what exists is derived. The explanatory attempt involving the four elements: fire, earth, air and water, is commendable, considering that we must not project our modern knowledge about the physical elements. Rather, we must envision terms heavily laden with significance: that which is hot, the fuel and its processes, the solid components of matter, the gaseous component, and water as the primordial material

of life. Back then, however, the divide in the world's philosophies lays elsewhere. At issue were the structure and composition of the predetermining primeval causes (or their negation).

Some believed that primordial matter was structureless and bore an elemental force within, from which all that becomes arises, and that a parallel force provides form and shape. That which exists is absolutely transmutable, changeable, and bears within a creative force that can create the cosmos and all matter. Those who followed Democritus, on the other hand, believed the world to be composed of numerous building blocks that were indivisible and intransmutable. According to Democritus, everything is formed of these parts, but this only occurs through jolts and pressure from outside.

The history of physics over the last two thousand years is one of pervasive confrontation between these two world views. On the one hand, the creative nature force: despite all efforts to unmask this force, every new dis-covery by humans merely opens new, darker and deeper chasms. On the other hand, dead, lifeless matter and the fortuitous mixture of building blocks and particles. The spiritually creative natural force (potentially attributable to a Creator) versus pure materialism that has nothing to conceal.

In the mid-20th century, these conflicting world views were also reflected in a conflict between metaphysics and science theory in the natural sciences. Nonetheless, the underlying issue can be answered today: the materialistic viewpoint has failed to be confirmed. Astoundingly, the most exact of all sciences, namely physics, provided the decisive insight.

Today's world view about the cosmos and matter can be summarized as follows. The more knowledge we gain, the more uncanny yet fascinating it becomes.

The black holes that Einstein predicted opened new insights into potential space-time worlds and, therefore, into the composition and dynamics of our universe. They enabled extreme gravity features and temporal as well as spatial "singularities" to be recognized.

Stefan Hawking and other scientists like Edward Witten further unravelled these possibilities and discovered the following cornerstones:

a) Our universe might be accompanied by other, parallel universes that may be in contact with each other at specific points of intersection, where transitions occur. Due to stable space-times, however, no overlaps exist, and such transitions are conceivable only in the singularities.

b) The string theory: The building blocks of matter are not point- or wave-shaped particles, but unimaginably thin filaments. Compared with the size of an atom, one such string has the same relative size as that atom to the entire solar system. These strings can be calculated mathematically.

Strings do not fit into 4-dimensional space-time worlds, but rather into the 11-dimensional ones. Only 4 dimensions have developed since the Big Bang. Seven additional ones remain rolled up and, figuratively speaking, un-developed. These 7 additional dimensions can be found at every point in our universe.

Higher-dimension space-time dimensions are incompletely developed in the lower ones. These are (mem)branes. These branes are conceivable and possible at every point in our universe; they are realized only in extreme space-time situations such as in black holes.

Perhaps, dark matter, which hypothetically should make up most of the matter in our universe, is present in a parallel universe and functions like gravity in our universe, without being able to interact with normal matter.

On the other hand, perhaps gravity is a force that exerts an influence in more than one space-time world, a mere bubble phenomenon of a force that is actually predominant in a parallel universe. Gravity might also be the attraction between matter and dark matter in another dimension separated solely by space-time borders.

Particularly the highly favoured string theory, but also the thesis of multiverses, confirms Aristotle's view of highly transformable matter – a pri-mordial material prior to the

existence of particles and waves, something much like the strings. The cosmos is truly not something that can be explained from a purely materialistic perspective, as already postulated by Heisenberg. What we know as matter dissipates into highly transformable elemental forces that pack unimaginably powerful forces into unimaginably small dimensions. Nuclear fission has more than clearly demonstrated it to us.

Nonetheless, biology continues to act as if its material objects reflect a world view dominated by materialistic physics. The strict causality of a strict material principle predominates, all functioning according to strict natural laws. If something unexpected emerges, then it is attributed to chance or is emergent, inexorably originating from within itself.

While our knowledge of modern physics is becoming increasingly less materialistic, biology's explanation of life continues to proceed as if these changes in the world view of physics never took place. In its materialistic approach, biology follows classical metaphysical rules: it proceeds from assumptions that are ultimately founded on dogmas of belief. Its experiments ask questions in one direction only, a direction that merely serves to confirm the underlying assumptions. It views life as a complexly structured accumulation of material, whose dynamics are without spirit, without creative force, originated by chance. Nonetheless, the metaphysical foundations of modern biology are beginning to shake. The unsolved problems in molecular biology, epigenetics and evolutionary theory are gaining increasing urgency.

It is not my intention, as you might believe, to prompt a rehabilitation of metaphysical thought. Nonetheless, metaphysical thought should be overcome in both its idealistic and materialistic form. It inhibits our search for practicable self-understanding; furthermore, it hinders progress – rooted in this self-understanding – in realigning our relationship to the nature surrounding us. We must truly understand ourselves before we can comprehend that our species-specific hybris was a historical self-misunderstanding. Only then will we be able to assume our place on this planet, not as rulers but as caretakers wielding responsibility.

If we wish to understand ourselves, we must understand the language that we use. I do not intend to repeat the results of the linguistic and pragmatic turn in the second half of the 20th century. Perhaps, only this much: those who wish to satisfactorily explain human language must be able to satisfactorily explain the following accompanying phenomena in the discourse between two or more partners:

If we begin with human self-understanding – and there is no real alternative – then our theory of understanding must be able to concurrently explain and formulate, in everyday language, the following phenomena:

- the simultaneous understanding of identical meanings in two inter-acting partners, as expressed in successful, coordinated activity
- the differentiation between deep and superficial grammar of a statement along with differentiation between locutionary, illocutionary and performative speech acts with which the statements are made
- the differentiation between communication-oriented action and strategic Verdinglichung of the communicating partners.
- the evaluation of the influence being claimed with a certain statement.

A definition would have to achieve this before we – as a communicating (bio-logical) species that seeks to understand its inner and outer nature – can con-sider having attained a foundation for human self-understanding. Impor-tantly, it is on this foundation that we pursue science that we attempt to establish constructions such as the concept of objectivity, etc. Only then will meaningful theories of natural science arise, theories that understand them-selves and their use of language both subjectively and objectively. And after giving up the ideal of

exactness, we can once again cautiously raise the ques-tion: “What stands behind all things, τα μετα τα φψσικα?"