K.V. LAURIKAINEN EXTENDING THE LIMITS OF SCIENCE

Tarja Kallio-Tamminen

Contents

Abstract

- Why Prof. K.V. Laurikainen because of quantum physics was led to the notion that consciousness and psychological phenomena cannot be excluded from the physical picture of the world, and what were the consequences?
- What kind of worldview Laurikainen himself defended and what he saw to be the major setbacks and ethical hazards if common understanding does not change accordingly.

My acquintance with Prof. Laurikainen

- I attended Laurikainen's course on 'Scientific revolutions'. This was a philosophical class with captivating contents
- Laurikainen was describing the actual process of how the philosophical ideas present in science had guided research, technical innovations and the development of societies.
- It was so much more interesting and real than the abstract theoretical courses, with invented examples, that typically were available at the philosophy department.

My acquintance with Prof. Laurikainen

- My usually so eager and competent students looked disbelieving and unsatisfied – somehow disappointed.
- The best explanation I could come to was that they had originally chosen the exact physics to feel safe. They wanted the world to be predictable.
- The strict deterministic laws in the universe should bestow humans the opportunity to use their knowledge for the benefit of all.

My acquintance with Prof. Laurikainen

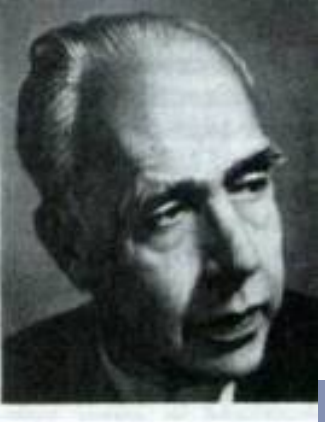
- I did not share the ideal of total control. I felt that we humans are part of reality, included in and dependent on a bigger whole whose depths are not yet known to us.
- Thus it was a relief for me that something strange was encountered in physics, something that did not support the idea of simple clockwork.
- Habitual explanations completely missed our inner life and subjective experience. They did not give any basis for ethics or personal development.

My acquintance with Prof. Laurikainen

- I decided to avoid a direct contact with strong and determined Laurikainen to create my own independent view.
- I ended up with the Copenhagen interpretation, but with Bohr's ideas rather than Pauli's.
- Still, my approach was close enough to Laurikainen's to make him contact me when I finally published something.

Various flavors of Copenhagen

- Everyone involved knew they were re-evaluating the whole tradition of natural science, and handling matters of great depth and philosophical significance.
- Nevertheless the interpretation was never worked up into a systematic presentation.
- In details their viewpoints and emphases differed quite a lot.
- According to Heisenberg, he himself was essentially the mathematician, Pauli was the critic and Bohr was the philosopher emphasizing complementarity and the epistemological lesson of quantum mechanics.



Niels Bohr

Various flavors of Copenh

- **Bohr** probably shared Pauli's belief that renewal of the conception of reality was the most important task of the age
- But unlike Pauli he **was not willing to postulate any new ontology**.
- By reconsidering the role of humans and the character of their theories and representations one already achieves a deep change in the attitude towards nature.
- Ontological pictures are less important.
- At best they are partial descriptions completing each other – valuable tools, which should not be taken to be final truths.

Various flavors of Copenhagen

- Laurikainen was fascinated by Pauli's profound ideas and metaphysical intuitions, such as Anima Mundi, cosmic archetypes or quaternity **which aimed to catch the transcendent reality behind phenomena.**
- He believed that Bohr made too many compromises to traditional realism and materialistic philosophy and thus somehow betrayed the most important issues.
  - Yet a scientist is supposed to keep all the options open. Bohr did not rush to fill in the gaps by postulating dubious entities.

Various flavors of Copenhagen

- The differences between our views are not as important as the similarities we share.
- The Copenhagen approach promoted quite similar conclusions in us related to the limits and distortions in the present worldview, and consequently in the scientific approach.

What proved to be wrong in the approach of classical physics?

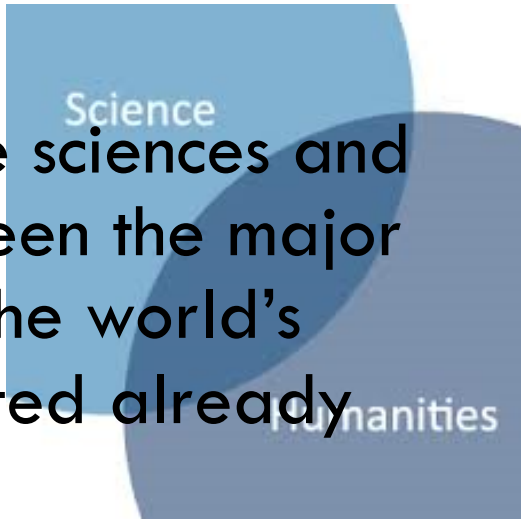
- We cannot solve our present crisis if we do not acknowledge that **the roots of science are in meta- physics**. Physics and metaphysics must learn to live side by side – so also scientific knowledge and belief
- Quantum theory challenged the deepest metaphysical assumptions related to reality which were adopted along with classical physics in the beginning of the modern era, thus initiating a deep paradigm change.

What proved to be wrong in the approach of classical physics

- Since the beginning of the modern era we have been taught that reality consists of matter in motion. It is comparable to clockwork: mechanical, quantitative and without any purpose.
- The view was based on solid mathematical theory, Newtonian mechanics, and confirmed by accurate empirical observations.
- It was taken to be true, and also the unwarranted metaphysical presuppositions such as atomism, determinism, reductionism and detached external observer became generally accepted.

What proved to be wrong in the approach of classical physics

- Yet the classical framework contained quite serious anomalies and limitations.
- In particular it does not provide any basis or space for the existence of consciousness, freedom or responsibility. It is not able to explain how humans are related to nature.
- The flaw resulted in a split between two cultures.
- The breakdown of proper communication between the sciences and the humanities has been the major hindrance to solving the world's problems as C. P. Snow stated already in 1959.



What proved to be wrong in the approach of classical physics

- Reality is not deterministic and everything cannot be explained with material bodies moving in space-time.
- Nobody really knows
  - 1) What is the basic stuff everything ultimately consists of?
  - 2) How do the objects and their properties emerge?
  - 3) How the parts and the whole are related together?
  - 4) What is the role and locus of humans?

What proved to be wrong in the approach of classical physics

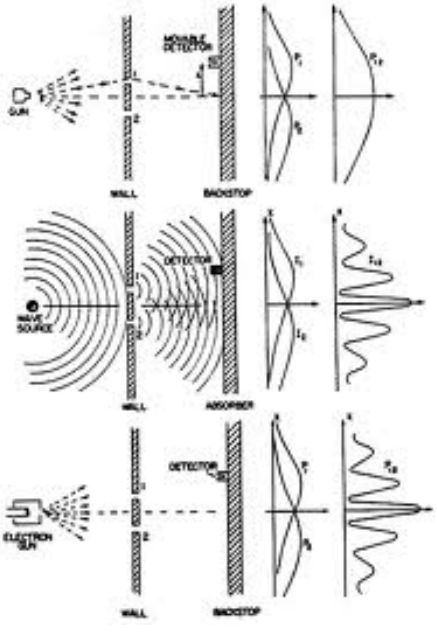
- Reality is not deterministic and everything cannot be explained with material bodies moving in space-time.
- Nobody really knows
  - 1) What is the basic stuff everything ultimately consists of?
  - 2) How do the objects and their properties emerge?
  - 3) How the parts and the whole are related together?
  - 4) What is the role and locus of humans?

What proved to be wrong in the approach of classical physics

- In addition to quantum phenomena, a new synthesis is needed in order to get a coherent understanding of many results which are emerging from fields such as complex systems, neuroscience, epigenetics, or bioinformatics.
- Thomas Kuhn: **a great paradigm change always changes the old rules, and raises new questions, categories, and distinctions.**
- There is now a real opportunity to create a framework where the old controversies between science and humanities, or Western and Eastern thought may disappear.

Revelations of quantum physics

- In addition to external relations there are **subtle non-local connections** between seemingly separated parts.
- According to different interpretations the new kind of **invisible factor,** suggestive of Pauli's archetypes, affecting the formation of matter may be called a field, potentiality, or information.



Revelations of quantum physics

- Reality is certainly more reminiscent of the One, many layered existence typically described in perennial philosophy than the clockwork of classical physics.
- According to Laurikainen the properties of independent reality began to acquire features characteristic of a living organism.

Revelations of quantum physics

Pauli's psychophysical reality

- Jung's depth psychology
- Archetypes
- Unus mundus
- Psychophysical reality
- Science and religion complementary

Eastern epistemology and ontology

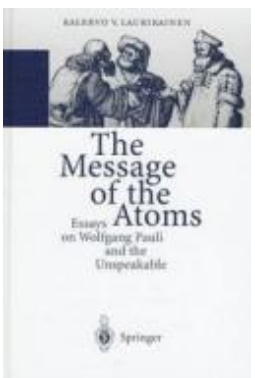
- Samkhya and vedanta philosophy
- Observers and actors
- Bohr' s coat of arms
  - Taoist yin-yang symbol

Revelations of quantum physics

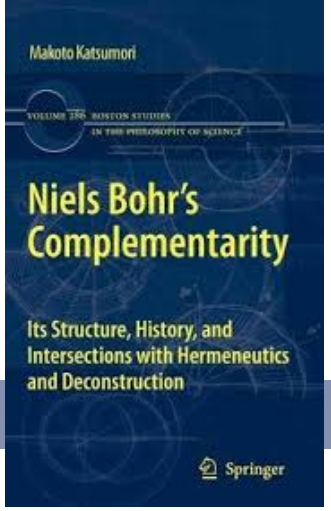
- Quantum physics provides tools to overcome Cartesian dualism
- Measurements do make a change to the irreversible unfoldment of events.
- Human choices and history shall not be excluded from the objective reality.

Exceeding false beliefs

- Laurikainen and Pauli seem to accept quite traditional concepts of science and religion.
- By being complementary both are limited in the sense that they are not able to enter each other's area.
- **When religion is reclaimed, science is doomed to be limited.**
- This is what Laurikainen was saying when he stressed that science has its limits.
- He never entered the task of really extending the limits of science, meaning its method.



Exceeding false beliefs



- Along with Bohr it is possible to broaden the context, and transcend the dualism of different limited views and approaches
- We should not take any conceptual model too seriously. Not even the best of them should be taken as a final truth that fundamentally corresponds to reality.
- Skipping over to a more sophisticated conception at the right time is imperative for personal growth and cultural advance.

Exceeding false beliefs

- To my mind science should not be limited to its traditional sphere but by proper widening of its method it would be possible to enter the domain of introspection and inner experience.
- It is time to admit that psychological phenomena cannot be excluded from the physical picture of the world, which was the main message Laurikainen undertook to deliver.

Exceeding false beliefs

- The inner core of humans is very much unknown to science. It is probably what Laurikainen was talking about when he with great reverence referred to the **Irrational**.
- I would not name it so, but nevertheless I too put my hope on this **deep unknown territory** which is the source of our conscious mental activity, conceptions and models.

Conclusion

- I just wish there is enough wisdom and strength in us to set us free from the outdated beliefs that suited the building of the modern era.
- It is now time to move on into a less restricting framework where the old controversies between science and humanities, and Western and Eastern thought may disappear
- K.V. Laurikainen certainly was on his way towards this noble end.

ons o sics