

Big Mismatch between the New Technology and the Old

Mechaistic Viewpoint

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Klaus Schwab, head of the WEF, says that the world has begun the Fourth Industrial Revolution since the turn of this century (*The Fourth Industrial Revolution*, 2016). It is based on and significantly builds on the third industrial revolution that began in the 1960s - commonly referred to as the computer revolution or digital revolution. It is a much more highly integrated revolution that has transformed society and the global economy. It is certainly true that recent advances in individual fields of technology, particularly biotechnology and information technology, have been remarkable and many are eye-opening.

However, on the other hand, we cannot shake the question of whether this wave of technological innovation, which shows no signs of stopping, is progressing in a healthy manner. Rather, in the first place, we have no idea what direction humanity is heading under this wave. Experts have often issued warnings, such as the Asilomar Conference (1975) and the Asilomar AI Principles (2017). Individual discoveries and inventions have such a speed and scope of impact on society that, when viewed as a whole, they seem to be causing more confusion than contributing to the harmonious development of humanity.

In this presentation, I would like to point out the mismatch of "treating new technologies that utilize the micro world from an old mechanistic perspective that is based on the macro world" as one of the main causes of this situation where technology seems to be running out of control.

The outline is

- ① Until the 19th century, natural science focused on macroscopic matter, and the ideas that treated its physical behavior, is basically a mechanistic theory (classical physics), which is also common sense.
- ② In the 20th century, physics has opened up the micro world that has never been seen before (electrons, atomic nuclei, atoms, molecules, etc.). However, this behavior could not be fully understood using the mechanistic way of thinking up until the 19th century. Originally, we should have established a worldview that unified the macro and micro worlds. But physicists were only able to obtain mathematical formulas (quantum theory) that deal with each issue individually.

- ③As a result, we have used a method of processing microscopic objects complementing with macroscopic mechanistic thinking.
- ④This contradiction has been particularly exposed in the field of technology. If this barbaric mismatch is left unaddressed, there is a great possibility that it will bring about a crisis in human history. The development of nuclear bombs led to this. Next is genetic manipulation under mechanistic thinking. Especially recent problem of AI development is a matter of great urgency.
- ⑤How can we overcome this mismatch?
- We have to unify the macro and micro worlds by solving the measurement problem of quantum mechanics, as T. Takabayashi did in his physical theory of measurement (2001).
 - Quantum biology should be encouraged so that biotechnology and AI can be more properly developed.
 - We should explore the image of a new wider viewpoint given by Quantum theory including the physical theory of measurement.
 - We need to establish a new unified worldview so that we can overcome the mechanistic way of thinking and the sustainability of humanity on earth will be guaranteed as common sense.

(講演は、日本語を使用します)