Research Report

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History of Western Philosophy from the quantum theoretical point of view

by

Shiro Ishikawa

Shiro Ishikawa
Department of Mathematics
Keio University

Department of Mathematics
Faculty of Science and Technology
Keio University

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3-14-1 Hiyoshi, Kohoku-ku, Yokohama, 223-8522 Japan

4.4 Archimedes (BC.287 - BC.212)

Archimedes was born in Syracuse on the island of Sicily in the Mediterranean. Archimedes studied in Alexandria that was a center of the study and engaged in the study of "Elements" with pupils of Euclid afterwards. He returned to Syracuse later and spent life in Syracuse.

4.4.1 Buoyancy (Archimedes' principle)

Archimedes' principle is as follows.

(A) Any object, wholly or partially immersed in a fluid, is buoyed up by a force equal to the weight of the fluid displaced by the object. If some want to avoid the term "force", then

$$\begin{aligned}&\big[\text{the weight of the matter in water}\big]\\ =&\big[\text{the weight of the matter}\big]-\big[\text{the weight of water with the same volume of the matter}\big]\end{aligned}\tag{4.1}$$

I have not yet examined the following.

(B) Did Archimedes know "fluid pressure"? That is, did he know the following?

$$\begin{aligned}\big[\text{Buoyancy}\big]=&\big[\text{Sum of the fluid pressure from the bottom of the object}\big]\\ &-\big[\text{Sum of the fluid pressure from the top of the object}\big]\end{aligned}$$

♠**Note 4.4.** A famous anecdote of the golden crown is the delicate anecdote that there is not connected with Archimedes' principle. In like there is a relationship, I try to write this in what follows.

- The King of Syracuse asked Archimedes "Can you check whether silver is not mixed by the crown without breaking the crown". Archimedes notices next answer (♯) during bathing: while shouting with joy too much "Heureka!"(="I have found it!"), was running around the streets naked without even wearing clothes.

  (♯) Preparing the gold bullion of the weight same as the crown, compare the weight the gold bullion and the weight is the crown in water. Then, we can, by the (4.1), compare the volume of the gold bullion and the volume of the crow.

♠**Note 4.5.** For each great discovery, an anecdote (or, a catch copy) is left as follows.

($\sharp_1$) Archimedes$\cdots\cdots$golden crown

($\sharp_2$) Galileo$\cdots\cdots$Leaning Tower of Pisa, "And Yet It Moves"

($\sharp_3$) Newton$\cdots\cdots$Newton's apple, "Geocentrism vs. Heliocentrism"(*cf.* Note 6.7)

($\sharp_4$) Descartes$\cdots\cdots$"I think, therefore I am."

($\sharp_5$) Einstein$\cdots\cdots$Elevator

($\sharp_6$) quantum mechanics$\cdots\cdots$Heisenberg's uncertainty principle

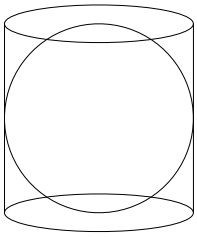
($\sharp_4$) and ($\sharp_6$) are due to my opinion(($\sharp_4$):Sec.7.3, ($\sharp_6$): refs. [8, 32]).

4.4.2 The tomb of Archimedes

Consider the ball B of radius r. Archimedes showed the followings:

$$\text{The volume of the ball } B = \frac{4\pi r^3}{3}, \qquad \text{The surface area of the ball } B = 4\pi r^2$$

If you are a genius, you may find the proof by seeing the lower illustration('the cylinder which is circumscribed to a ball' called "the tomb of Archimedes"). If you are not genius, you can calculate it by using the differential and integral calculus.



4.4.3 Principle of leverage

Archimedes found" principle of a lever" and did more various invention with a lever. He said "Give me a place to stand, and a lever long enough, and I will move the world". In spite that Archimedes referred Aristarchus' Heliocentrism in his book: "The Sand Reckoner", he supported Aristotle's Geocentric model. However, Archimedes, found " principle of a lever", have to restate Aristarchus' Heliocentrism((B_1) in Sec.4.3.2) as

(C) Since the sun is overwhelmingly larger than the earth, the thing center of gravity that merged the earth with the sun is predominantly near to the sun. Hence, **the sun and the earth go around the center of gravity of both the earth and the sun.**

If Archimedes said so, science history would be history which is completely different from now.

♠**Note 4.6.** Note that

- Archimedes did not speak a ambiguous things like Plato's philosophy.

Therefore the work of Archimedes is quantitative, clear and easy to understand. Since power could interpret the vague philosophy conveniently, philosophy could influence to maintain harmony with religion or politics. In fact, philosophy survived in the middle ages as a maid of theology. On the other hand, Archimedes' work was almost forgotten.

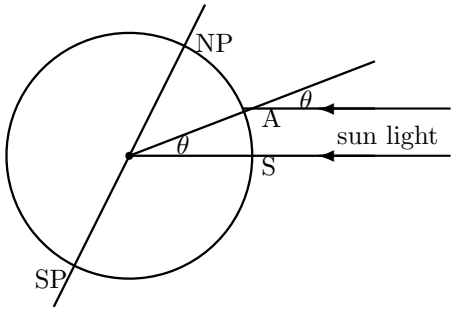
4.5 Eratosthenes (BC.275 - BC.194)

4.5.1 The biggest ancient observer

Because the lunar eclipse was a shadow of the earth, Aristotle knew that the earth was a ball. Because it seems to be an arc when seeing a sea, someone would find that more earth

is a ball from before However, if we have to specify the two discoverers, we may say a scientist:"Eratosthenes" and an explorer:"Magellan".

Eratosthenes measured the whole circumference of the earth as follows.



NP:North pole, SP:South pole, A:Alexandria, S:Syene(=Aswan)

- Syene is on the tropic of cancer, thus, the sun is seen in right above at noon on the summer solstice.
- Aswan is located just south of Alexandria. The distance $=AS$=925km.

Hence,

the whole circumference of the earth $= 2 \times 3.14 \times$ [the radius of the Earth] $= 360AS/\theta$
$=360 \times 925/7.2 = 46250km$

As the recent result:40009km, it may be surprising.

♠**Note 4.7.** Since Aristarchus discovered

$$\big[\text{the diameter of the moon }\big] : \big[\text{the diameter of the earth }\big] : \big[\text{the diameter of the sun }\big] = 1 : 3 : 19$$

then, by Eratosthenes's result, we know that

$$\big[\text{the diameter of the moon }\big], \big[\text{the diameter of the earth }\big], \big[\text{the diameter of the sun }\big].$$

4.6 Claudius Ptolemaeus (AD.83 - 168)

4.6.1 The ancient scientific collected studies

Ptolemaic Dynasty is ruined by the death of Cleopatra, Rome became the heyday of the Five Good Emperors era. At this time, Ptolemaeus (AD.83 - 168) played an active part in Alexandria. In his book "Almagest", he adopted Aristotle's Geocentrism (i.e., the sun goes around the earth). Ptolemaeus explained the retrogression seen at a planet in Mars such as Mars revolves around the earth while drawing a small circle as "epicycle". Ptolemaeus compiled the latest theory in those days and concluded the Geocentrism under the enormous measured data.

(A) Ptolemaeus followed Aristotle, Archimedes, etc.

And it is sure

(B) **Ptolemaeus is a top-notch researchers.**

♠**Note 4.8.** Archimedes is the discoverer of "principle of buoyancy", which belongs the realistic world description. we can get as follows (*cf.* Assertion 1.3[classification of philosophers]).

$$(\flat)\begin{cases}(\flat_1): \text{the realistic world description (physics)}\\ \quad \textbf{Aristotle}, \textbf{Archimedes}, \text{Galileo}, \text{Newton}, \text{Einstein}, \cdots\\ (\flat_2): \text{the fictional linguistic world description (The main street of western philosophy)}\\ \quad \textbf{Plato}, \text{Scholasticism}, \text{Descartes}, \text{Locke}, \text{Leibniz}, \text{Berkeley}, \text{Hume}, \text{Kant}, \text{Husserl}\\ (\flat_3): \text{the scientific linguistic world description (statistics, quantum language)}\\ \quad \textbf{Parmenides}, \textbf{Zeno}\ \text{J. Bernoulli}, \text{statistics (Fischer, etc.)}, \text{quantum language}\end{cases}$$

Chapter 5

The Middle Ages - Dark Ages -

The Middle Ages may be characterized as "the time of the thought stop for about 1500 years" Thus, it is called

"Dark Ages" or "Philosophy is a maidservant of theology"

In this chapter, we discuss:

($\sharp_1$) Augustinus(354 - 430): Christianity became the state religion of the Roman Empire. Subjective time theory

($\sharp_2$) Anselmus(1033 - 1110): the father of Scholasticism, Arguments for the existence of God, Realism in Problem of universals

($\sharp_3$) Thomas Aquinas(1225 - 1274): Completion of the scholasticism (Summa Theologica): Compromise between Plato philosophy and Aristotle philosophy

($\sharp_4$) Ockham(1285 - 1347): Occam's razor, Nominalism in Problem of universals

5.1 Augustinus(AD. 354 - 430)

5.1.1 Philosophy is a maidservant of theology

One of the largest events in the Western history is

AD.380: Christianity became the state religion of the Roman Empire

A wonder of Western philosophy is:

(A) Western philosophy met with a dying crisis many times. Western philosophy was rescued by a hand of someone's help (such as a hand of help of a god) .

Augustinus (AD. 354 - 430) is one who extended a helping hand to dying Plato philosophy. Catholic father Augustinus used Plato philosophy to reinforce a theoretical backbone of Christianity.

For this,

(B) It's desirable that God (in Christianity) and Idea (in Plato philosophy) have the similar nature.

The opinion of Socrates=Plato is contrary to sophists' opinion (i.e., "Man is the measure of all things"), which is also contrary to Christianity (i.e., "God is the measure of all things"). Therefore, there is a reason to consider that

$$\text{God' intelligence} \approx \text{Idea}$$

Augustinus might think so.

The Plato philosophy got the strongest supporter (i.e., Christianity).

(C) Philosophy won a help from Christianity. But this implied "Philosophy is a maidservant of theology". And philosophy fell into a thought stop, but, at least, Philosophy survived.

All proceeded as Augustinus' plan.

♠**Note 5.1.** It isn't known whether fathers of Christianity (Augustinus, etc.) were serious in Plato philosophy. I do not think that they were serious because the famous philosopher Anselmus appeared 600 years later after Augustinus.

♠**Note 5.2.** Readers may have the following question:

($\sharp_1$) Why do fantasy theories always win the Western philosophy?

My opinion is as follows. Recall the Platonic method of telling philosophy:

($\sharp_2$) $\underset{\text{introduction·preface·fiction}}{\boxed{\overset{\text{world is so}}{\text{fictional linguistic world description}}}} \xrightarrow{\text{therefore}} \underset{\text{main subject}}{\boxed{\overset{\text{Live so}}{\text{Ethics·morals}}}}$

Therefore,

- [world is so] is secondary, subsidiary,
- [you should do so] is main theme

Most of the main subject (i.e., ethics·morals) is guaranteed by Christianity. Therefore, the preface (i.e., the world description) does not matter anything in fantasy theory even in fiction, even allegory. However, the following question may be suggestive:

($\sharp_3$) If there is no "the theory of Ideas" only by "I know that I know nothing", did Augustinus adopt Greek philosophy?

We think that "the theory of Ideas" had an unexpected effect (i.e., the effect that Plato might not expect).

5.1.2 "Confessions" by Augustinus: Time theory prohibited by the linguistic Copenhagen interpretation

We want to know:

① How do we live?

② How is the world made?

Fathers of Christianity preached this answers to the people as a spokesman of God. It should be noted that people never want the scientific answer about ② but a short story.

Bible says:

(D_1) This world was created by God.

If so, people may have a question:

(D_2) How about before God made it?

However, if we believe in (D_1), then we consider that

(D_3) Time was also made at the same time as the world.

Therefore,

(D_4) The sentence "before God made it" is nonsense.

If we are told by fathers of Christianity so, we think that

(D_5) my Bible reading was superficial. I had a boring question

It should be noted that people want such a short story, and not scientific arguments.

Augustinus asserted the following in his book "Confessions".

(E):Augustinus' theory of time as a short story

(E) **Only present exists, and neither future nor past exist.**

In fact,

(F) the future is in "prediction", the past is in "memory". There is what we can realize "only now".

This is the beginning of the subjective time (which may be a main theme in philosophy). Although this "time" cannot be use in science, this time can be use in the Platonic method of telling philosophy as follows.

5.1.3 There is no tense in science

Now,

- Augustinus' tense (past, present, future) is a kind of sermon. But it may be interesting in comparison with the linguistic Copenhagen interpretation (*cf.* (E_2) in Sec.1.1.2), i.e.,

  There is no tense in science.

Thus, it is prohibited to Augustinus' tense (i.e., the subjective time) is discussed in science. However, we can appreciate literary pleasure from the philosophical discussions.

5.1.4 "Subjective time" is a magic word which excites our delusion.

The subjective time (tense, observer's time) attracts philosopher's interests. For example, Bergson (1859 - 1941) tried to challenge the controversy to Einstein about time theory. But, Einstein said, "I did not know the time of the philosopher" and declined a debate. Even now, researchers of quantum mechanics have been confused yet in "observer's time". For example, in quantum mechanics, some researchers may accept "So-called Copenhagen interpretation" such as

- At the moment when an observer measures it, a wave function collapses.

In order to explain "At the moment when observer measured it", von Neumann made a non-scientific word "abstract ego", and said

- "At the moment when observer measured it" is "at the moment when a signal reach abstract ego"

which is of course prohibited by the linguistic Copenhagen interpretation (*cf.* (E_2) in Sec.1.1.2). For the quantum linguistic understanding of "wave function collapse", see [30, 32].

♠**Note 5.3.** "What is the subjective time?" This is a problem of brain science for science as well as a literature-like problem (a kind of word play concerning self-reference) for philosophy. When we thought by the scale as the human history, "subjective time" was almost all everything and "objective time" may be negligible. It is sure that a cat and a dog etc. have clock gene or biological clock, thus they have to feel the subjective time. This is a scientific problem. However, if we study the subjective time without experiment, that is, we think in brain that "intracerebral clock" is perceived by brain, our investigation becomes rather self-referential, i.e., philosophical. The subjective time makes us appreciate the literary pleasure (i.e., the pleasure of wordplay) of "self-reference".

♠**Note 5.4.** For completeness, let us rewrite as follows.

① How do we live? ② How is the world made?

Here,

- "①: the problems of life" and "②: the problem of world" are different things

In spite of the difference, we prefer to Platonic method of telling philosophy:

- the "logic" which is dressed so that ① may be derived from ②.

In this sense, the ② is a reason attached later. We might be convinced that "the world description was to describe the world plainly and with no fiction". However, Plato and Augustinus consider that

- the world description is to create the world that it is convenient for faith or doctrine.

This is a replacement of the problem. However, this succeeds in science as well as philosophy. As seen later (Kant' Copernican revolution, Wittgenstein' words "The limits of my language mean the limits of my world", and finally, quantum language),

- the world description is not to to describe the world plainly and with no fiction, but to create the world that it is convenient for faith or doctrine. (*cf.* Explanation 9.1).

that is, "not realistic painting, but abstract painting". Concretely saying, for example,

- When there is a kind of the paint only in "red" and "green", We draw as much as possible it seems realistic picture in this two colors

This is not only the philosophical case but also the scientific case (i.e., quantum language). That is because two axioms (Axiom 1 and Axiom 2 in Sec.1.1) are chosen by our selfish convenience.

5.2 Scholasticism – from Plato to Aristotle –

5.2.1 Aristotle's philosophy spread to the Islamic world

I do not know the details of the reason, but I say:

(A) Plato philosophy survived by the support of Christianity(e.g., Augustinus). On the other hand, Aristotle philosophy spread over Islam.

Baghdad was a center for eastern Islam. The western Islam culture developed for Cordoba of the Andalucia district of south Spain as a center, and it was developed and was a city with the biggest population in the world in the 10th century. Islam learned much wisdom from a book of ancient Greece and Rome and developed the original thought, technique. Aristotle is believed in. And there was Islamic culture in a tip of the world.

♠**Note 5.5.** In this paper we adopt the story such as (A). Actually, it may not be such a simple story.

5.2.2 Crusade expedition and Inflow of Islamic culture

In the era of crusade expedition (1096 - 1270), the Western countries were in a downturn (dark ages under Christianity). Such public opinion had been drifting.

- An outcome of a crusade doesn't rise by Plato way: Thus, let's study Aristotle which is the tip of Islamic culture!

Regardless of all ages and countries,

- the necessary workforce is people in the literature in peace time, people in science in wartime.

As the by-products of crusade expedition, Aristotle philosophy has flowed into Western Europe, and fused with Plato philosophy. That is, Scholasticism was born. As the typical persons of Scholasticism, we list up as follows.

(B_1) Anselmus (1033 - 1109) "The father of Scholasticism", Realism

(B_2) Thomas Aquinas (1225 - 1274) "Summa Theologica", Greatest man in Scholasticism

(B_3) Ockham (1285 - 1347) "Ockham's razor", Nominalism

After all,

Scholasticism is a fusion of Plato philosophy and Aristotle philosophy

Of course, it is impossible to succeed this trial: That is because

- $$\begin{cases} \text{the realistic world description:(Aristotle)} \underset{\text{(monism)}}{} \longrightarrow \text{Newton} \longrightarrow \cdots \\ \text{the linguistic world description :(Plato)} \underset{\text{(dualism)}}{} \longrightarrow \text{Descartes} \longrightarrow \cdots \end{cases}$$

That is, Plato philosophy and Aristotle philosophy are "oil and water", and these are different categories (*cf.* Assertion 1.2[the history of world description]). However, in this paper, we prepare the story such as

- in the process of fusion of Plato philosophy and Aristotle philosophy, disadvantages of the theory of Ideas became clear, which led to Descartes.

Also, by-product of crusade expedition, we have to note

- "Positional notation (= the discovery of zero)" of the origin in India

which will be mentioned in what follows.

5.3 The discovery of zero

5.3.1 Positional notation (= the discovery of zero): Arabic numerals

As mentioned in the previous section

(A) Plato philosophy was transmitted to Christianity world, and Aristotle philosophy was transmitted to Islam world.

The two (i.e., Aristotle philosophy and the positional notation) flowed into Europe from Islam by an expedition of a crusade.

♠**Note 5.6.** "Which was influential, Aristotle philosophy or the positional notation?" Then, at least we can say as follows.

"Which was indispensable for the proposal of Newtonian mechanics?" Then, we may choose the positional notation.

How to write numbers to learn in an elementary school is the positional notation. For example,

- +5040302, - 15, +39.045, - 81.5, $+3.1415\cdots$
  - 1000, $+0.009876$, $+0.3333\cdots$, 0,

and so on. That is, By 13 symbols "0, 1, 2, 3, 4, 5, 6, 7, 8, 9, +, −, . (radix point)", we can express all real numbers by the positional notation.

Hence, we may say

- the discovery of the positional notation (= Arabic numerals)
  = the discovery of all real numbers.

(the radix point was discovered in Europa of 16 century AD.)

Of course, the discovery of zero is

(B) the discovery of how to use zero called the positional notation

5.3.2 Arabic numerals and Roman numeral

Roman numerals are often used on the clock face such as

1=I, 2=II, 3=III, 4=IV, 5=V,...,10=X, 11=XI,

However, it is too hard to represent large numbers such as

495 = CDXCV, 1888 = MDCCCLXXXVIII, 3999 = MMMCMXCIX

5.3.3 The explosion of mathematics

Mathematician Gauss(1777 - 1855) said

(C) "If genius Archimedes invented the positional notation, I am certain that the mathematics must have progressed drastically."

The positional notation triggered off the following "the explosion of mathematics" happened:

(D) Solution of algebraic equations, complex numbers, the function concept, betting of problem (probability), analytic geometry (Descartes coordinates), calculus, differential equations, linear algebra, number theory, etc.

♠**Note 5.7.** There may be several opinions about the three big discoveries of mathematics. We think as follows.

① the discovery of the plane (geometry)

② the discovery of zero (positional notation)

③ the discovery of sets

Of course, it is needless to say that the biggest discovery is "⓪:the discovery of natural numbers".

5.4 The proof of the existence of God

5.4.1 Anselmus (1033 - 1109)

From the our standing-point proposed in this paper, the following proof is not trusted since it is not discussed under a certain world description.

Proof 5.1. Anselmus: the proof of God's Existence

①: It is a conceptual truth (or, so to speak, true by definition) that God is a being than which none greater can be imagined (that is, the greatest possible being that can be imagined).

②: God exists as an idea in the mind.

③: A being that exists as an idea in the mind and in reality is, other things being equal, greater than a being that exists only as an idea in the mind.

④: Thus, if God exists only as an idea in the mind, then we can imagine something that is greater than God (that is, a greatest possible being that does exist).

⑤: But we cannot imagine something that is greater than God (for it is a contradiction to suppose that we can imagine a being greater than the greatest possible being that can

be imagined.)

⑥: Therefore, God exists.

□

The above proof is not worth validating since it is not discussed under a certain world description. This is just a word game.

5.4.2 Review: the world descriptionism

Let us review the world descriptionism.

(A): World descriptionism (*cf.* Sec.1.3.1)

The world descriptionism is as follows.

(A) $\underbrace{\boxed{\text{world description}}}_{\substack{\text{world is so}\\ \text{premise}}} \xrightarrow{\text{therefore}} \underbrace{\boxed{\text{discussions, calculation, logic, properties}}}_{\substack{\text{conclusion}\\ \text{subject}}}$

That is,

(B) The world descriptionism is the spirit "Start from the world description".

Thus, from the our standing-point (i.e., world descriptionism), Proof 5.1 is not trusted.

5.4.3 The inflow of Aristotle philosophy

Although we cannot understand Proof 5.1, we think that Anselmus did not say much more than the following:

(C) "Aristotle philosophy flowed in via Islam, and I underwent the influence".

That is,

$$\begin{array}{ccccccc} \text{Plato} & \longrightarrow & \text{Idea} & \longrightarrow & \text{God} & \longrightarrow & \text{The existence of God} \\ & & & & \text{via Islam}\uparrow\text{inflow} & & \\ \text{Aristotle} & \longrightarrow & \text{syllogism} & \longrightarrow & \text{proof} & & \end{array}$$

If Aristotle Philosophy said something to the existence of God, we can conclude that

(D) Augustinus' intention:"intelligence of God=Idea" passed expiration date. And Aristotle's influence is increased

5.4.4 Saying in an exaggerated manner, $\cdots$

Although Anselmus' argument itself is nonsense, Scholasticism may be the revolution in Christianity in the following sense:

(E) $\underset{\text{Plato}}{\boxed{\text{Belief}}} \xrightarrow[+\text{ Aristotle}]{} \underset{\text{Scholasticism}}{\boxed{\text{Belief and Thought}}}$

The reason Anselmus won fame is due to the above (E), that is,

(F) the discovery of the magic phrase "the proof of the existence of God", which breaks a thought stop.

It is said that the work of Anselmus had a big influence on philosophers (such as Descartes, Kant) of modern times. Probably, it is true. Descartes rashly deduced the existence of God from the cogito proposition. Kant has made a careless error in "antinomy"(*cf.* Sec.8.1). As Newton was devoted to alchemy, I think that the philosophy gradually developed to the present age while trailing the Middle Ages.

♠**Note 5.8.** All scientists are interested to "god". "What is god ?(= How about neuronal circuit concerning belief?)" and "What is subjective time? (= How about biological clock?) are one of the most interesting problems in brain science.

5.5 Problem of universals

5.5.1 Problem of universals –Graft a bamboo shoot on a tree –

The problem of universals is the biggest dispute in Scholasticism. This problem is as follows.

(A):Problem of universals

"Problem of universals" is as follows.

(A_1) It is certain that Mr. Smith, Mr. White, Mr. Brown, etc. exist. Then, we have the following problem:

Do "honesty", "intelligence", etc. exist?

If "Yes", then, Realism. If "No", then, Nominalism.

Since the meaning of "exist" is not defined, the above problem is only word-play. However, let us say a little as follows.

Explanation 5.2. In what follows, let us review Plato philosophy and Aristotle philosophy:

(B_1)
- Plato: [the actual world and the world of Idea]
  the world of Idea ("honesty", "intelligence", etc.) exists
  the actual world is a shadow picture of the world of Idea
- Aristotle: [hyle and eidos]
  matter (=hyle) exists,
  state (=eidos), whose components have various names ("honesty", "intelligence", etc.)

Therefore,

(B_2) Plato school agree to "Realism": that is, "honesty" exists in the world of Idea.
e.g., Anselmus (1033 - 1109)

(B_3) Aristotle school agree to "Nominalism": that is, "honesty" is a certain component of the state (*cf.* Note 3.9)
e.g., William of Ockham (1285 - 1347)

Most people may have the following question:

- Why did great Fathers argue eagerly in a problem like such word game?

After all, we think

- This is the problem such that "(since Augustinus) Plato school (Realism) vs. (via Islam)Aristotle school (Nominalism)". The power in the church gradually shifted to the Aristotle group. In this sense, it may be called "confusion" than "dispute".

As seen in the following table, the problem "realistic world description(monism) vs. linguistic world description(dualism)" is the biggest dispute in philosophy and science. Nominalism (Ockham) in Problem of universals is a little irrational since religion is not realistic.

Table 5.1 : realistic world description vs. linguistic world description (*cf.* Assertion 1.4)

dispute ＼ [R] vs. [L]	Realistic world description	Linguistic world description
ⓐ: motion	Hērakleitos	Parmenides
ⓑ:Ancient Greece	Aristotle	Plato
ⓒ: Problem of universals	Nominalism(Ockham)	Realism(Anselmus)
ⓓ: space-time	Newton	Leibniz
ⓔ: quantum theory	Einstein	Bohr

ⓐ is my fiction, ⓒ is a confusion rather than dispute. ⓓ is the Leibniz=Clarke correspondence(*cf.* Note 7.8), ⓔ is Bohr=Einstein debates. Quantum language is proposed as one of answers to Bohr=Einstein debates(*cf.* ref. [32]).

5.5.2 Ockham's razor

William of Ockham (1285 - 1347), a Scholastic philosopher or theologian born in Ockham in England, is known as an advocate of Ockham's razor(=the law of parsimony) in philosophy and science.

(C):Ockham's razor(=the law of parsimony)

Ockham's razor is as follows:

(C) Shave unnecessary assumptions with a razor!

However, this may be a self-evident truth.

For example,

(C_1) Assume that you were a student of Plato and Plato asked you

- "The sun goes around the earth? or the earth goes around the sun?"

Then, which did you answer to Plato?

Probably, you, by Ockham's razor, answer that the sun goes around the earth. In fact Aristotle did so. Ockham's razor is dependent on the environment around. Thus I have a question:

(C_2) Is there a case as which Ockham's razor is functioning effectively (besides the mathematical theorems) ?

I guess that

(C_3) What Ockham wanted to shave with a razor is the theory of Ideas

(*cf.* Sec.5.5.3).

5.5.3 Thomas Aquinas (1225 - 1274)

The Catholic priest: Thomas Aquinas (1225 - 1274) wrote "Summa Theologica" as the summing-up of Scholasticism. He was the most important at the intermediate time of Scholasticism (or, Problem of universals), that is,

$$\underset{\text{(Realism)}}{\boxed{\text{Anselmus}}} \longrightarrow \underset{\text{(compromise or fusion)}}{\boxed{\text{Thomas Aquinas}}} \longrightarrow \underset{\text{(Nominalism)}}{\boxed{\text{Ockham}}} \tag{5.1}$$

His proposal is the compromise of Realism (due to Plato) and Ockham (due to Aristotle), thus, his theory has three key-words:

(D_1) :[universalia ante res] as Plato's Idea (i.e., measuring instrument in quantum language)

(D_2) :[universalia in rebus] as Aristotle's eidos (i.e., state in quantum language)

(D_3) :[universalia post rem] as actual world (i.e., measured value in quantum language).

Since Plato philosophy and Aristotle philosophy are "oil and water", and these are different categories (*cf.* Assertion 1.2[the history of world description]), it is a matter of course that Aquinas' idea is irrational. However, as seen in Table 5.2, we say:

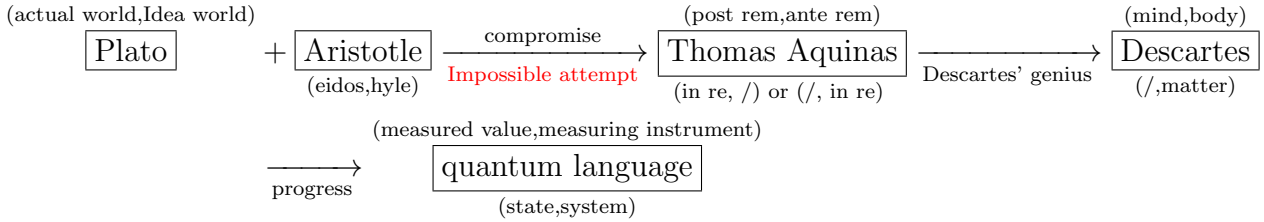
(E) in the process of fusion of Plato philosophy and Aristotle philosophy, deficiencies in the theory of Ideas is turned to reveal, this led to Descartes.

that is,

Table 5.2 : Key-words in each world description

Plato	actual world	Idea	/ [/]
Aristotle	/	/	eidos [hyle]
Thomas Aquinas	universale post rem	universale ante rem	/ [universale in re]
Descartes	I, mind, brain	body	/ [matter]
quantum language	**measured value**	**measuring instrument**	**state** **[system]**

Review 5.3. In the above table, the meaning of the correspondence of key-words is as follow.



Also, the formula 5.1(=the history of Scholasticism) is rewritten as follows.

$$\underset{\substack{\boxed{\text{Augustinus}}\\(\text{Realism})}}{\text{Plato}} \longrightarrow \underset{\substack{\boxed{\text{Anselmus}}\\(\text{Realism})}}{\text{Plato (+ Aristotle)}} \longrightarrow \underset{\substack{\boxed{\text{Thomas Aquinas}}\\(\text{compromise or fusion})}}{\text{Plato + Aristotle}} \xrightarrow[\text{overstep}]{} \underset{\substack{\boxed{\text{Ockham}}\\(\text{Nominalism})}}{\text{Aristotle}} \tag{5.2}$$

Thus, I guess that Ockham shaved Plato's Idea theory with a razor. (*cf.* (C_3) in Sec. 5.5.2).

♠**Note 5.9.** It's said that the problem of universals is incomprehensible. This is due to the fact:

- The fusion of Plato and Aristotle is an unreasonable trial,

That is,

($\sharp_1$) Aristotle (as well as Newton) do not fit in Christianity.

($\sharp_2$) Although the key-words of Thomas Aquinas philosophy and those of Descartes philosophy are similar (i.e., those have three key-words as seen in Table 5.2), this may be accidental. (*cf.* Review5.3).

♠**Note 5.10.** A seen in the above, the problem of universals is in confusion. However, we think that Scholasticism belongs to the linguistic world view. Thus, we have (*cf.* Assertion 1.3[classification of philosophers]).

$(\flat)$
- $(\flat_1)$: the realistic world description (physics)
  Aristotle, **Archimedes**, Galileo, Newton, Einstein, $\cdots$
- $(\flat_2)$: the fictional linguistic world description (main street of western philosophy)
  Plato, **Scholasticism**, Descartes, Locke, Leibniz, Berkeley, Hume, Kant, Husserl
- $(\flat_3)$: the scientific linguistic world description (statistics, quantum language)
  Parmenides, **Zeno** J. Bernoulli, statistics (Fischer, etc.), quantum language

Chapter 6

Early modern – From Geocentrism to Heliocentrism

We assume that the three greatest paradigm shifts are as follows

($\sharp_1$) Aristotelian world view (purpose) $\longrightarrow$ Newtonian world view (causal relation)

($\sharp_2$) Ptolemaic system: Geocentrism $\longrightarrow$ Copernican system: Heliocentrism

($\sharp_3$) Christianity: Adam and Eve $\longrightarrow$ Darwin: evolution theory

In this chapter, we are concerned with ($\sharp_1$) and ($\sharp_2$), and conclude that

- ($\sharp_2$) is a metaphysical dispute, which cannot be made clear by experiments. And it was clarified by ($\sharp_1$). In this sense, ($\sharp_2$) is included in ($\sharp_1$).

6.1 Paradigm shift

Eastern Roman Empire was made to be ruined by Ottoman Turkey in 1453.

- 1453:The Eastern Roman Empire extinction (Constantinople surrender)

The influence on Christ cultural area of this great event is immeasurable.

Traffic of "Silk Road" became inconvenient. And thus,

Age of Discovery had begun

Also, engineers, artists, cultural people, etc. (of Eastern Roman Empire) had flowed into Western Europe as refugees. And hence,

Renaissance rose suddenly.

The timeline is as follows.

Before Galileo: The era of observation and experiment

- 1450: Gutenberg's printing press

- 1492: Columbus, discovery of the American Continental
- 1498: Vasco da Gama, discovery of the sea route to India
- 1500s: Leonardo da Vinci, "Mona Lisa's smile"
- 1510: Copernicus, Heliocentrism.
- 1510: Raffaello, "The School of Athens", Admiration to ancient Greece
- 1517: Luther, Protestant Reformation
- 1519 - 20: Magellan, the first circumnavigation of the Earth
- 1540s: Michelangelo, "The Last Judgment"
- 1609∼1619: Kepler's laws of planetary motion
- 1610: Galileo, A telescope was made and moons of Jupiter were found.
- 1620: Francisco Bacon, "knowledge is power", The father of British Empiricism
- 1633 Galileo's trial "And yet it moves"

After Galileo: The era of thought

- 1637: "Discourse on the Method", Rene Descartes (1596 - 1650), the father of modern philosophy, Cogito proposition
- 1670: Pascal, "Pensèes"
- 1685 - 1750: Bach
- 1687: Newton, "Principia"
- 1688: Glorious Revolution
- 1690: John Locke, the father of British Empiricism, "An Essay Concerning Human Understanding", tabula-rasa, the secondary quality
- around 1700: Jakob Bernoulli, the law of large numbers,
- 1703: Leibniz, "New Essays on Human Understanding"
- 1715 - 16: Leibniz-Clarke correspondence (*cf.* Note 7.8)
- 1739: Hume, "A Treatise of Human Nature"
- 1781: Kant, "Critique of Pure Reason"

♠**Note 6.1.** The law of large numbers, discovered by J. Bernoulli(1654 - 1705), is as follows.

(♯) If a fair coin (one with probability of heads equal to 1/2) is flipped a large number of times, the proportion of heads will tend to get closer to 1/2 as the number of tosses increases.

I think that Bernoulli's achievement equals Galileo's achievement. That is,

$$\begin{cases} \text{Scientific pioneer in the realistic world description} \cdots \text{Galileo} \\ \\ \text{Scientific pioneer in the linguistic world description} \cdots \text{J. Bernoulli} \end{cases}$$

It is difficult to identify the founder of the probability theory to one person. But, J. Bernoulli is one of the founders.

6.2 Bacon (1561 - 1626): The father of empiricism, Inductive reasoning

6.2.1 How to create science: The exclusion of idols (=prejudice, preconception)

Bacon has been called the father of empiricism. In 1620, he proposed "how to create science" (called inductive reasoning, or induction principle) in his book "Novum organum".

(A):Induction principle (by bad idols), how to create science

His proposal is as follows.

(A) ①:Exclusion of bad idols ⟶②:data collection⟶③:scientific theory

Let us explain this in what follows.

① : Firstly, we have to exclude bad idols (=prejudice, preconception) Here, idols is as follows.
Idols of the Tribe: prejudice due to sense organs
Idols of the Cave: prejudice due to custom, the education
Idols of the Market: prejudice due to language
Idols of the Theatre: prejudice due to thought, theory

② : Next, we have to collect data by observation, experiments,

③ : Lastly, find the essence from the data, and build science theory.

Here, "②+③" is called "abduction".

6.2.1.1 Isaac Newton (the exclusion of bad idols) (1642-1727)

Newton said:

"I frame no hypotheses"

And he practiced Bacon's induction principle, and proposed Newtonian mechanics as follows.

(B): ①exclude bad idols (i.e., Aristotle's purpose, Geocentrism) ⟶ ②Data collection (due to Tycho Brahe, Kepler, Galileo) ⟶ ③Science theory (Newtonian mechanics)

♠**Note 6.2.** This may be say in a philosophy side. We must add the next section (good idols).

6.2.2 How to create science; good idols

Bacon's induction principle is not simple. there is another way (by good idols) such as

(C): Induction principle (by good idols)

Induction principle (by good idols) is as follows.

(C) ①believe good idols ⟶ ②Data collection ⟶ ③Science theory

6.2.2.1 Isaac Newton (good idols) (1642-1727)

Newton said:

"I frame no hypotheses"

And he practiced Bacon's induction principle (good idols), and proposed Newtonian mechanics as follows.

(D): ①believe good idols (i.e., Causal relation) ⟶ ②Data collection (due to Tycho Brahe, Kepler, Galileo) ⟶ ③Science theory (Newtonian mechanics)

♠**Note 6.3.** Although ironically,

(♯) Bacon, who proposed the exclusion of idols, was also one of discoverers of "good idols" called "causal relation".

If so, what Bacon wanted to say really may be

$$[\text{ bad idols }] = [\text{ dogmatism in Scholasticism }]$$

6.3 From Geocentrism to Heliocentrism

6.3.1 What is "Geocentrism vs. Heliocentrism"?

As mentioned in Chap.4,

- Heliocentrism due to Aristarchus (BC.310 - BC.230) is based on the arguments:

  The big sun cannot go around the small earth.

  I think his Heliocentrism to have reached the scientific level. (*cf.* Sec. 4.3).

- Geocentrism due to Ptolemaeus (AD.83 - AD.168) can explain the motion on planets by epicycle theory. Thus, I also think his Geocentrism to have reached the scientific level at the time. (*cf.* Sec. 4.6).

However, Heliocentrism due to Copernicus (1473 - 1543) might not reach the scientific level. It may be the popular view, but there is an opinion that

- At the time, Europe is in the cold period, the masses were hungry for "the sun".The public was hungry for the sun central principle. Therefore, there is a foundation that allows the germination of Heliocentrism.

Thus, I cannot have the conviction that there was the firm argument for Heliocentrism due to Copernicus.

I'll leave above-mentioned things to historians. In this paper, I discuss the next.

(A): What is "Heliocentrism vs. Geocentrism"?

Now,

(A) Note that motion is relative. Thus, if the earth is assumed to be at center, the sun goes around the earth (i.e., Heliocentrism). Also, if the sun is assumed to be at center, the earth goes around the sum (i.e., Geocentrism). Hence,

The difference between Heliocentrism and Geocentrism may be only a difference of how to take the coordinate system.

♠**Note 6.4.** The coordinate does not exist in nature, that is, it is artificial. Cf. Note 3.9.

6.3.2 Somehow "from Geocentrism to Heliocentrism"

In what follows, I will arrange the history of "Heliocentrism vs. Geocentrism".

Analyzing the enormous data obtained by Tycho Brahe's steady astronomical observation, Kepler found the following laws:

- Kepler's laws of planetary motion:
  1609: The first law of elliptical orbits, The second law of areal velocity,
  1619: The third law of Periods:

And

1610: Galileo found the moons of the Jupiter by his telescope of the self-made

And further,

1633: Galileo said "And yet it moves" in the Trial of Galileo

In this way, we think:

(B) Somehow the air "to Heliocentrism" has been formed.

Still, I am worried about this problem (A)"What is 'Geocentrism vs. Heliocentrism'?"

That is,

(C_1) Did Both Galileo and the church understand the essence of 'Geocentrism vs. Heliocentrism'?

which is equivalent to

(C_2) In order to win the definitive victory, what should they (Galileo or the church) have done?

In order to answer to this question, we first have to clarify the meaning of "Heliocentrism vs. Geocentrism".

♠**Note 6.5.** In the next year of 1642 when Galileo died, Isaac Newton was born in the British country.

6.3.3 "Geocentrism vs. Heliocentrism" is the problem of the world-view

As mentioned in the previous section, how to decide "Geocentrism vs. Heliocentrism" is somewhat difficult. That is because

(D) Thus, if the earth is assumed to be at center, the sun goes around the earth (i.e., Heliocentrism). Also, if the sun is assumed to be at center, the earth goes around the sum (i.e., Geocentrism). Hence, The difference between Heliocentrism and Geocentrism is only a difference of how to take the coordinate system.

In the same sense, we say that

(E) **No matter how much there are exact observation data, we cannot decide "Geocentrism or Heliocentrism"**

In the famous trial of Galileo, he said

"And Yet It Moves"

However, I wonder if Galileo knew the (E)?

♠**Note 6.6.** No matter how much there are exact observation data, we cannot decide "Geocentrism vs. Heliocentrism" we have to need the world description. That is,

($\sharp_1$) it is a matter of course that there is no science without measurement

However, we believe that

($\sharp_2$) there is no science without world description

Thus, as seen later, we cannot decide "Geocentrism vs. Heliocentrism" without world description

6.3.4 The Galileo legend; Leaning Tower of Pisa, Trial of Galileo

The world view of Aristotle has kept its position for 1500 years. Thus,

This world view is not a so bad world view.

But, this worldview was a little inconvenient to organize the data, obtained by technological innovation (e.g., telescope, navigation, etc.). The history of the increase of the inconvenience is as follow:

$$\big[\text{Copernicus}\big] \Rightarrow \big[\text{Kepler}\big] \Rightarrow \big[\text{Galileo}\big]$$

However, these are not sufficient to decide "Geocentrism vs. Heliocentrism". It is a matter of course that there were excellent persons in the church. And they might think:

- if they insisted that motion is relative, they did not lose the dispute, at least, they could make "Geocentrism vs. Heliocentrism" endless dispute.

Galileo legend

Galileo was an active leader of the overthrow of the world view of Aristotle, and his targets were the following (F_1) and (F_2):

(F_1) Ptolemaic Geocentrism

(F_2) Aristotelian purpose such as "Heavy objects fall faster"

Concerning the two, We have two episodes called "Galileo legend" as follows.

For (F_1), "And Yet it moves" in trial of Galileo

For (F_2), Leaning Tower of Pisa

Thus,

- At the time (1633) of the trial of Galileo, the church side could drew the dispute (i.e., endless dispute).

Endless dispute implies the win of the church. The church is not so stupid.

No way, the church did not think that Newton would appear

Nobody would expect an appearance of Newton.

After all, Galileo was the active leader of the overthrow of the world view of Aristotle, but he could not propose the new worldview. In this sense, the Galileo legend is only an opening act of the Newton appearance.

6.4 Principia; Newtonian worldview

6.4.1 Principia (1687)

"PhilosophiæNaturalis Principia Mathematica" (in short, "Principia") , written by Newton (1687), is the most famous and important book in science. Three laws of Kepler were derived

from three laws of dynamics and the law of universal gravitation. Principia was written based on elementary geometry and not the differential and integral calculus. Why did Newton (= advocate of differential and integral calculus) not write Principia based on differential and integral calculus? Although there may be several opinions for this question, The work (based on differential and integral calculus) was succeeded by Leibniz, J. Bernoulli, Euler, D'Alembert, Lagrange and Laplace, etc. and was completed.

6.4.2 After all, the world descriptionism

The following biggest paradigm shift in the history of science is as follows.

(A) Motion [Motion function method: (Parmenides, Zeno, Aristotle)]

$\xrightarrow[\text{paradigm shift}]{}$

Causal relation [Kinetic differential equation method: (Newton)]

That is, we see:

(B): Paradigm shift [Newtonian mechanical worldview]

Now,

(B) $\underset{(\text{ purpose })}{\boxed{\text{Aristotle's worldview}}} \xrightarrow[\text{paradigm shift}]{} \underset{(\text{ causal relation })}{\boxed{\text{Newtonian worldview}}}$

Here, Newtonian worldview means Newtonian mechanics, that is,

Newton's kinetic equation (i.e., the chain of causal relations)
+ the law of universal gravitation

Recall that the main theme of this paper is the world descriptionism(*cf.* Sec. 1.3.1). As mentioned frequently up to this point,

(C_1) The argument in ordinary language (or, in the motion function method (*cf.* Sec.2.3.3)) is fuzzy, and thus, "Geocentrism vs. Heliocentrism" cannot be decided. Thus, we need a new worldview.

In Principia, Newton proposed Newtonian mechanics (i.e., Newtonian world view) and showed that

(C_2) **When the motion of the sun and the planets is studied, the calculation becomes easy under the assumption that the planets go around the sun.**

Therefore, even the definitions "center" and "go around" depend on the worldview. After all, we conclude that

(D) "Geocentrism vs. Heliocentrism" is not the problem of measurements, but the problem of the world description.

♠**Note 6.7.** If so, the following established opinion should be reconsidered:

($\sharp_1$) Aristotelian world view (purpose) $\longrightarrow$ Newtonian world view (causal relation)

($\sharp_2$) Ptolemaic system: Geocentrism $\longrightarrow$ Copernican system: Heliocentrism

($\sharp_3$) Christianity: Adam and Eve $\longrightarrow$ Darwin: evolution theory

That is because ($\sharp_2$) is a consequence of ($\sharp_1$). There may be a reason to consider that ($\sharp_2$) is an episode of the birth of ($\sharp_1$) (*cf.* Note 4.5).

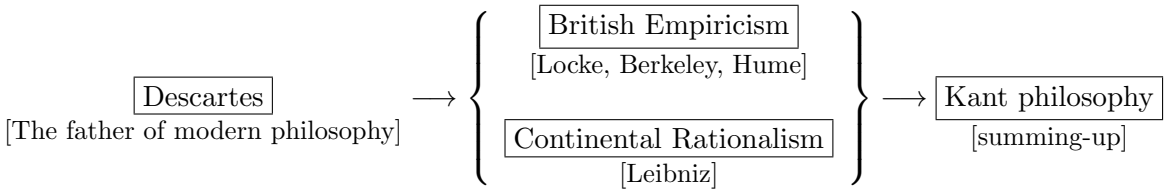
♠**Note 6.8.** Here, we have (*cf.* Assertion 1.3[classification of philosophers]).

($\flat$)
- ($\flat_1$) : the realistic world description (physics)
  Aristotle, **Archimedes**, **Galileo**, **Newton**, Einstein, $\cdots$
- ($\flat_2$) : the fictional linguistic world description (main street of western philosophy)
  Plato, **Scholasticism**, Descartes, Locke, Leibniz, Berkeley, Hume, Kant, Husserl
- ($\flat_3$) : the scientific linguistic world description (statistics, quantum language)
  Parmenides, **Zeno** J. Bernoulli, statistics (Fischer, etc.), quantum language

Chapter 7

Modern philosophy(from Descartes to before Kant)

The following is called the flower of modern philosophy:



Now, although it is incredible, philosophy was believed "the king of the academic", and it was the times when philosophy was respected. Even so,

- Why were top elites in those days absorbed in the **useless** philosophy?

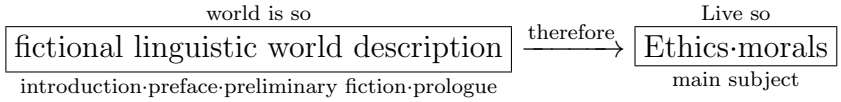
As mentioned frequently, I think that this is due to Platonic method of telling philosophy.

In this chapter, we discuss Descartes, British empiricism, Continental rationalism.

7.1 Self-referential propositions

7.1.1 The theory of Ideas: The expiration date expired

Let us review Platonic method of telling philosophy:



Then, ethics, morals is main, and the fictional linguistic world description is only preface. Although it is desirable that the world description in preface is a dualistic idealism (*cf.* Sec.3.3.1), the fairy tale is enough for anything. In fact, the theory of Ideas is just a fable. In an extreme case, using the psychological tricks such as

(A) "Intellectual's remark can be trusted", "As for the beautiful woman, a heart is fair" "We can trust the assertion of Kant who was too serious and stiff.", etc.

it may suffice to win the reader's trust in the preface (= world description).

The main current of western philosophy keeps Platonic method of telling philosophy. In Plato philosophy, the world description (=the theory of Ideas) is completely an allegory, and the main subject is due to Socrates' ethics. In cases of Augustinus and Scholasticism, the main subject is of course Christianity. Hence, the world description in the preface is not so important. For example, "only present exists" [resp. "barren discussion: Plato or Aristotle?"] is the intellectual act of killing time in Augustinus philosophy [resp. Scholasticism].

However, after the age of geographical discovery and the Renaissance, fairy tales and barren discussions are not quite satisfactory.

And Descartes thought that

The expiry date of the theory of Ideas was expired.

Descartes, using self-referential cogito proposition "I think, therefore I am", proposed the world description (i.e., Descartes philosophy (= mind-matter dualism)). Roughly speaking,

$$\underset{\text{(Plato)}}{\boxed{\text{the theory of Ideas}}} \xrightarrow[\text{cogito turn}]{} \underset{\text{(Descartes)}}{\boxed{\text{mind-matter dualism}}} \tag{7.1}$$

The philosophy of world description is only an anecdote, however, it should be effective for general people (and thus, quantitative arguments are not desirable). After all, following Socrates' self-referential statement "I know that I know nothing",

Descartes also wanted to use self-referential trick "I think, therefore I am"

♠**Note 7.1.** There is a good reason for the birth of Newtonian mechanics, for example, the age of discovery, positional notation, etc. On the other hand, there may not be a firm reason for the birth of Descartes philosophy as the continuation of Platonic method of telling philosophy. my opinion is as follows.

- Under the Christian strong influence, it could not be free to discuss the ethics. And thus, western philosophy devoted itself to the preface (i.e., world description) than the main subject (i.e., ethics).

Platonic method of telling philosophy might be a desperate strategy for western philosophy to coexist with Christianity.

7.1.2 Self-referential proposition

7.1.2.1 Philosophy is to enjoy wordplay concerning self-referential propositions?

The wordplay concerning self-referential propositions is often used in philosophy. This may be a tradition since Socrates' "I know that I know nothing".

Although I do not the exact definition of "self-reference", it suffices to consider that it is a proposition such that "Oneself talks about oneself". For example,

① Epimenides the Cretan says "All Cretans are liars."

② The set of all sets (this appears in Russel's paradox)

③ Number theory cannot be used to prove its own consistency. (Gödel's second incompleteness theorem)

④ "I know that I know nothing" due to Socrates

⑤ Time in brain (=subjective time: The brain senses the time in the brain.)

⑥ cogito proposition: "I think, therefore I am" (*cf.* Note 1.2, or Note 7.3)

and so on.

A self-referential proposition has the charm which always attracts interest. However, the cases, that the proposition of self-reference appearing quite frequently in philosophy is only interesting as a puzzle but is nonsense, are often found. The proposition of self-reference that emerges in mathematical fundamental theory may be regarded as the highest class in the history of mankind like Gödel's incompleteness theorem.

In fact, I consider as follows (*cf.* Conjecture 7.6):

(B_1) The self-referential argument is sometimes significant in mathematical logic. But, in the world descriptions (i.e., science and philosophy), self-referential arguments are always non-sense. Of course I did not deny the fact that, in philosophy, this is effective as a "signature phrase" and "impressive phrase".

Therefore, conclusively speaking,

(B_2) from the scientific point of view, the cogito proposition "I think, therefore I am" does not produce anything.

If we believe the (B), we can understand the reason that

- the genealogy of dualistic idealism (mind-matter dualism):

  $$[\text{Descartes}\rightarrow \ldots \rightarrow \text{Kant}\rightarrow \ldots \rightarrow \text{Husserl}]$$

  is not (scientific) productive but fun for literary arts.

♠**Note 7.2.** In this paper, we are interested in the non-sense self-referential propositions. As mentioned in Sec.3.5, the philosophy of world description is a kind of genre of literature. Thus, it is a matter of course that self-referential proposition plays an important role in philosophy.

7.1.2.2 The most enlightening exercise in this paper

Let us start from the following exercise, which is the most enlightening exercise in this paper:

Exercise 7.1. Descartes thought, in his book: "Discourse on the Method", that

the theory of Ideas has expired expiration date.

And Descartes asserted that the cogito proposition "I think, therefore I am" is the unquestion-

able truth. And further, Descartes proclaimed that "I" exists. Here, we present the following exercise:

(C_1) Where did Descartes find **"I"**?

Of course, the answer was not written in "Discourse on the Method". Thus,

(C_2) Answer this problem (C_1) from the quantum linguistic point of view!

- **[Hint]:** Again see Sec. 1.1.1 [Axiom 1 (measurement) and Axiom 2 (causal relation)]. Then, everyone can easily get the answer, which is uniquely determined.

If you can understand this problem without seeing Answer 7.7, you may taste exhilarating feeling. And,

You will completely understand
the true meaning of "I think, therefore I am".

Although Descartes himself might not have known the true meaning, he might have been convinced that the essence of dualistic idealism was hidden in the proposition "I think, therefore I am". This will be explained below.

7.2 I think, therefore I am. ("Discourse on the Method" by Descartes)

Let us start from the most famous philosophical proposition (Cogito ergo sum, cogito proposition) "I think, therefore I am" in Descartes' book "Discourse on the Method".

After Descartes read Bacon's "Novum organum", he decided "Start from the unquestionable truth", this is the most famous philosophical proposition (=cogito proposition):

"I think, therefore I am"

That is, Descartes think:

I think that 'I think, therefore I am'

which is rather self-referential. And further, he was convinced that

- Every statements derived from the cogito proposition are absolutely trusted

That is,

Proposition 7.2. The first principle (= cogito proposition) in philosophy
Now,

(A) Descartes doubted everything. And he arrived in the cogito proposition which has no doubted room. That is, he arrived in

(B) I think, therefore I am.

And, he proclaimed that the cogito proposition (B) is the first principle in philosophy.

(Notice) "I" and "exist" are incomprehensible words, and thus, the cogito proposition as well as "the existence", "Kant's antinomy") is a kind of "What we cannot speak about". Also recall the relation between the cogito proposition and the linguistic Copenhagen interpretation (*cf.* Note 1.2).

In ordinary language, the meaning of "exist" is not clear as follows.
(a): Does the sun exist?
(b): Does "beauty" exist?
(c): Does "mathematics" exist?
(d): Does "love" exist?
(e): Does "Higgs boson" exist?
(f): Does "dinosaur" exist?
(g): Does "nothing" exist?
(h): Does "past" exist?
(i): Does "time" exist?
(j): Does "I" exist?

When thinking now, "Descartes' misunderstanding" is obvious. As spoke many times before, the logic in ordinary language cannot be trusted. For example, without world description, we see several inconvenience as follows:

- Zeno's paradoxes (*cf.* Sec.2.4),
- Aristotle's syllogism (*cf.* Sec.3.6.3),
- Only "now" exists (*cf.* Sec.5.1),
- Anselmus' "Arguments for the existence of God" (*cf.* Sec.5.4),
- The difference between Geocentrism and Heliocentrism is not clear (*cf.* Chap.6),

First, neither "the proposition which has no doubted room" nor "self-evident proposition" exists.

(C) No theory that is started from the proposition which has no doubted room cannot succeed. Also, the meaning of "self-evident" is not self-evident.

Three motion laws in Newtonian mechanics are not self-evident. The theory of relativity and quantum mechanics are not evident. Non-Euclid geometry (due to Gauss (1824) , Lobachevsky (1829) ,etc.) says that

Start from "productive" than "self-evident"! (*cf.* Sec.4.2)

I suspect that

(D) Would there be really people who took Descartes' idea seriously?

In Platonic method of telling philosophy, the world description is only the preface (or, advertising slogan). In this sense, instead of the theory of Ideas, the cogito proposition might be used.

♠**Note 7.3.** (= Note 1.2) Note 1.2 is rewritten as follows. It is one of the roles of the linguistic Copenhagen interpretation to exclude a scientifically nonsense propositions from a quantum language (e.g., self-referential proposition (*cf.* Sec.7.1). As mentioned later, for example,

(♯) Cogito proposition **"I think, therefore I am"** is not within quantum language.

In cogito proposition, we see that "observer"="I" and "object to be measured"="I",which is inconsistent with the linguistic Copenhagen interpretation (E_1) in Sec.1.1.2. Thus, cogito proposition is not a proposition in quantum language.

Summary 7.3. [**Summary of the cogito proposition**] Let us summarize the cogito proposition as follows.

(E_1) The cogito proposition "I think, therefore I am" is an incomprehensible proposition (*cf.* Note 7.3),

But,

(E_2) This has attracted the interest of many people. And Descartes had now declared a "the existence of 'I'"(*cf.* Exercise7.1 and Answer7.7). After all, Descartes Asserted that "I" is the key-word in Descartes' philosophy as well in science.

Therefore, I would like to conclude that

(E_3) **Descartes' discovery "I" is the most important discovery in science** (*cf.* Assertion 1.1, Answer 7.7).

7.3 Descartes' strategy

The most important key-word in Descartes' philosophy is "I" (= "the first person"). Descartes thought that

Nobody pays attention even if Descartes appeals for the existence of "I" aloud.

Thus, as mentioned in Summary 7.3,

(A) Descartes used the advertising slogan "I think, therefore I am"

The cogito proposition is not important. What Descartes wanted to say is

(B) "I" is the most important key-word in Descartes philosophy.

His strategy succeeded wonderfully. If "I" is accepted, the existence of "matter" (which is perceived by "I") is accepted. And further, the medium of "I" and "matter" is automatically accepted as "body (= sensory organ)".

Therefore, the key-words of Descartes philosophy (= mind-matter dualism) is

(C) "I"(="brain", "mind"), "body"(="sensory organ"), "matter"

For completeness, it should be noted that this is not a consequence of the cogito proposition. That is the cogito proposition is the reason added afterwards.

Problem 7.4. (D) :Descartes' problem

Descartes proposed the fictional linguistic world description which starts from the three key-words

(D_1) "I"(="brain", "mind"), "body"(="sensory organ"), "matter"

And,

(D_2) Descartes declared "mind-matter dualism", and proposed the following two problems (i.e., mind-matter problem, mind-body problem):

That is,

(D_3) **mind-matter problem:**
Is the world that is perceived by me the same as The world that is perceived by me? That is, do we copy the world existing objectively exactly?

(D_4) **mind-body problem:**
How is "body" linked to "mind"?

[Notice]: Should be skeptical as to whether it is worth pursuing this problems. It should be noted that our main theme of this paper is to answer the following question:

$$\text{Plato} \xrightarrow[\text{model-change}]{\text{progress}} \text{Descartes ?}$$

After all,

(E) The cogito proposition "I think, therefore I am" is an advertising slogan of Descartes philosophy. And the world description is composed of Descartes problem (i.e., "mind-matter problem" and "mind-body problem").

Descartes might think as follows.

(F) The theory of Ideas has expired expiration date. Thus, in order to refresh philosophy, a new model-change (or, a new wrapping paper) is needed such that

Descartes' problem (D)

Even if this is a non-sense problem, this theory is stable until after 400 years (i.e., until the brain science is powerful). According to Platonic method of telling philosophy:

$$\underset{\text{introduction·preface·fiction}}{\boxed{\text{fictional linguistic world description}}} \xrightarrow[\text{therefore}]{\overset{\text{world is so}}{\qquad}} \underset{\text{main subject}}{\boxed{\text{Ethics·morals}}} \quad \overset{\text{Live so}}{\qquad}$$

by rewriting of the signboard, philosophy can be revived.

In fact, Descartes realized the biggest model-change.

If so, the following problem is essential.

Problem 7.5. Descartes' model-change:

$$\text{the theory of Ideas} \xrightarrow[\text{model-change}]{\qquad\qquad} \text{Descartes philosophy (Descartes problem 7.4)}$$

is regarded as a progress? That is, it is sure that Descartes' model-change is supported by many people. Almost people certainly believe that science makes progress, that is, science development is not fashionable change. However, there may be a lot of opinions about philosophy. We completely agree that it is fun to think of dualistic idealism (= dualistic metaphysical world). However, we have the question:

- Did western philosophy make essential progress?

which is essentially the same as

- Does dualistic idealism (= dualistic metaphysical world) deserve to study?

This will be answered throughout this paper (particularly, Sec. 10.2).

Brief explanation of Problem 7.5: Our answer to Problem 7.5 is "essential progress". As the reason mentioned in Assertion 1.5 of Sec. 1.4, the following key-words converge to "observable" such as

$$\underset{\text{(Plato)}}{\boxed{\text{Idea}}} \to \underset{\text{(Descartes)}}{\boxed{\text{body}}} \to \underset{\text{(Locke)}}{\boxed{\text{secondary qualities}}} \to \cdots \to \underset{\text{(quantum language)}}{\boxed{\text{observable(=measuring instrument)}}}$$

Although the final answer will be summarized in Sec. 10.2, it should be noted that there is no settlement (i.e., "essential progress" or "fashionable change"?) without ultimate goal (= quantum language). □

♠**Note 7.4.** I think that Descartes problem is a kind of self-referential problem, which is scientifically non-sense. In fact, Descartes problem was not fruitful from the scientific point of view. The followings also seem to be kinds of self-reference.

($\sharp_1$) [a brain in a vat] You don't know that you have hands. That is because
①: If you're a brain in a vat then you don't have hands
②: You don't know that you're not a brain in a vat
③: Therefore you don't know that you have hands

($\sharp_2$) Qualia problem, "What am I?"

($\sharp_3$) Arguments for the existence of God

($\sharp_4$) Time in brain, (= subjective time; perceive time in a brain by brain)

Everyone can enjoy the above as literary. If you are experimental scientists of brain science, you are interested in "brain circuit that believe in God" and "brain circuit of qualia". However, it should be noted that there is no brain science without experiment.

♠**Note 7.5.** As mentioned in ref. [32], I rewrite as follows. It is not true to consider that every phenomenon can be describe in terms of quantum language. Although readers may think that the following can be described in measurement theory, but we believe that it is impossible. For example, the followings cannot be written by quantum language:

$$\begin{cases} ① : \text{ tense—past, present, future —} & ② : \text{ Heidegger's saying "In-der-Welt-sein"} \\ ③ : \text{the measurement of a measurement,} & ④ : \text{Bergson's subjective time} \\ ⑤ : \text{ observer's space-time,} & \\ ⑥ : \text{Only the present exists (due to Augustinus(354-430))} & \end{cases}$$

If we want to understand the above words, we have to propose the other scientific languages (except quantum language). We have to recall Wittgenstein's sayings

The limits of my language mean the limits of my world

I consider that ①–⑥ are related to self-reference in the wide sense.

Here, I present the following conjecture, which is the precise form of (B_1) in Sec.7.1.2.

Conjecture 7.6. A scientific proposition and a self-referential proposition are disjoint.

Explanation: This may be easily solved from Assertion 1.1. That is, Assertion 1.1 says that any scientific proposition (except physics) can be described in quantum language. Also, as mentioned in Note 1.2, a self-referential proposition is prohibited by the linguistic Copenhagen interpretation. Thus, the above conjecture is surely true. However, in the above arguments, the term "self-reference" is only used like feeling. Thus, we cannot answer the above conjecture without the exact definition of "self-reference". That is, we have to answer the following question:

What is the definition of "self-reference" in the wide sense?

□

7.4 The correspondence of key-words in Descartes philosophy and quantum language

The key-words of Descartes philosophy (= mind-matter dualism) is

"I"(="brain", "mind"), "body"(="sensory organ"), "matter"

However, we cannot expect the substantial result even if we consider Descartes' problem. In fact, from the scientific point of view, the following modern philosophy is not fruitful:

However, the above three key-words are essentially important in the relation with the quantum language: Now let us explain this.

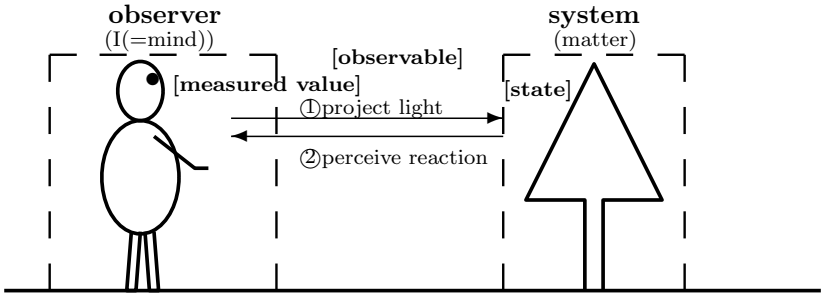


Figure 7.1: [Descartes Figure]: Image of "measurement(=①+②)" in dualism

For example, consider:

- Examine whether the hot or cold water in the bath and put your hands in the bathtub.

In this case, "hand" is regarded as "measuring instrument". In the same sense, "eye" is also regarded as "measuring instrument". Conversely, Glasses, microscope, telescope, etc. is a kind of body (= sensory organ). If so, we want to conclude that

$$\text{body (particularly, sensory organ)} \doteqdot \text{measuring instrument}$$

In the above Descartes figure, slightly incomprehensible one may be

$$\text{"I"(="brain", "mind")} \doteqdot \text{measured value}$$

However, it suffices to consider "there is no measured value without brain". For example when a needle of a voltmeter just moved, it is only a physical phenomenon. Nevertheless a movement of this needle is read, and it's sensed by a brain. Then, it for the first time becomes "measured value".

The reason that Descartes philosophy is useless is as follows.

(A) In spite that three key-words "mind", "body", "matter" are gathered, Descartes philosophy has no computable structure. This is only the fictional linguistic world description, and not the scientific linguistic world description.

Table 7.1: Key-words in each world description (*cf.* Assertion 1.5)

mind-matter dualism	[A](= mind)	[B](between A and B)	[C](= matter)
Plato	actual world	Idea	/ [/]
Descartes	I, mind, brain	body	/ [matter]
quantum language	**measured value**	**measuring instrument**	**state** **[system]**

That is, using the following change:

$$[\text{I}] \Longrightarrow [\text{measured value}],\ [\text{body}] \Longrightarrow [\text{measuring instrument}],\ [\text{matter}] \Longrightarrow [\text{system}]$$

we get the computable world description (i.e., Axioms 1 and 2 in Sec. 1.1.1), i.e., quantum language.

If so, we may affirmatively answer Problem 7.5, i.e.,

$$\text{Can the direction:"Plato} \xrightarrow[\text{model-change}]{} \text{Descartes" be regarded as progress?}$$

Lastly, let us present the answer of Exercise 7.1.

Answer 7.7. [Exercise 7.1:Where is "I"?] It suffices to find the "I" in Sec.1.1.1. The following is mentioned:

(B):Axiom 1 (measurement)

(The readers can read this axiom after they read Section 2.7 of ref. [32])

With any system S, a basic structure $[\mathcal{A} \subseteq \overline{\mathcal{A}}]_{B(H)}$ can be associated in which measurement theory of that system can be formulated. When the observer (="I") takes a measurement of an observable (or, by a measuring instrument) $\mathsf{O}=(X, \mathcal{F}, F)$ for a system $S_{[\rho]}$ i.e., a system S with a state ρ), the probability that a measured value x $(\in X)$ obtained by the measurement belongs to Ξ $(\in \mathcal{F})$ is given by $\rho(F(\Xi))(\equiv {}_{\mathcal{A}^*}(\rho, F(\Xi))_{\overline{\mathcal{A}}})$.

Thus, the answer is

"I" exists in Axiom 1 (measurement).

This implies that

(B_1) quantum language is the language that "I tell" (i.e., the language told by the first person

)

Also, recall Assertion 1.1:

(B_2) quantum language is a language, by which almost sciences (e.g., economics, psychology, engineering, etc.) are described

If so, [(B_1) + (B_2)] implies that

(B_3) **Sciences should be told by the first person**

Therefore, we may conclude that Descartes' discovery **"I"** is the biggest in science as well as philosophy.

7.5 Locke (1632 - 1704): The father of British Empiricism

7.5.1 "An Essay Concerning Human Understanding" by Locke (1689)

There may be a reason to consider that

(A) The role of Descartes was the elimination of such "spiritual power" and "supernatural being", and to prepare the social environment of the appearance of Newton. That is, Descartes was only the opening performer. In this sense, "I think, therefore I am" (the existence of "I") was only the side show of the opening performer.

And so,

(B) The role of Descartes, as the opening performer, had been finished by the appearance of Newton.

Even if there was such history, it wasn't strange.

However, strangely, there were people who took "the existence of I" or "Descartes figure" seriously. For example, John Locke (1632 - 1704) thought as follows.

(C) :"An Essay Concerning Human Understanding" by Locke (1689)

Locke is the successor of Descartes philosophy. He philosophically (i.e., without experiments) discussed the Descartes figure (i.e., the relation among "I"(="brain", "mind"), "body"(="sensory organ"), "matter"). He is called "The father of British Empiricism ($\approx$ epistemology)".

Locke may thought as follows.

(D) In the field of "matter" of Descartes figure, activity of Newton is remarkable. However, concerning the relation among "I"(="brain", "mind"), "body"(="sensory organ"), "matter", he wanted to reach the summit.

If so,

(E) It was too early more than 300 years to study "epistemology" in science in earnest.

Thus, it is impossible to expect the result.

However,

(F) If we think that the work of philosophers is "model-change", then the achievements of Locke is enormous.

7.5.2 "tabula rasa", primary quality and secondary quality

7.5.2.1 "tabula rasa"

Tabula rasa is a Latin phrase often translated as "blank paper" in English, that is,

(G) The "brain circuit" is a blank paper state at the start, but we look and hear in various ways, then "concept (= complex brain circuit)" is made.

Present-day brain science may say:

"It's equal to say nothing by such general opinion."

however, at any rate, the (G) is the starting point of British Empiricism.

♠**Note 7.6.** (*cf.* Note 7.9, Note 9.2) As mentioned later, considering "language" and not "cognition", then, in several languages (ordinary language, mathematics, Newtonian mechanics, programing language, etc.), we say tat

(♯) "ordinary language" is like tabula rasa

When a baby was born, a baby doesn't know ordinary language at all (i.e., a baby is with tabura rasa state). The baby is acquiring ordinary language by trial and error.

7.5.2.2 Primary quality and secondary quality

According to Locke,

(H_1) **primary quality** (i.e., inherent nature (=primary quality)) $\cdots$ weight, temperature, length, etc.

(H_2) **secondary quality** (i.e., sensations of inherent nature)$\cdots$ sweet, red, hot, salty, etc.

That is,

(I) :Locke's world description

The world is composed of two (i.e., "matter" and "mind (= observer)". "Matter" has inherent nature (= primary quality), "observer" has body (="sensory organ"). Through the sensory organ, secondary quality (sweet, red, hot, salty, etc.) is felt by our brain.

In terms of quantum language, we say:

primary quality$\Longrightarrow$state,
secondary quality$\Longrightarrow$observable (= measuring instrument)

as seen in the table below.

Table 7.2: The key-words of world descriptions (*cf.* Assertion 1.5)

mind-matter dualism	[A](= mind)	[B](between A and B)	[C](= matter)
Plato	actual world	Idea	/ [/]
Descartes	I, mind, brain	body	/ [matter]
Locke	mind	secondary quality	primary quality [/]
quantum language	**measured value**	**observable**	**state** **[system]**

Here,

(J) Locke represents the most important concept in dualistic idealism as the term "secondary quantity". The terms such as Idea, body, etc. may be not comprehensive. However,

- "secondary quantity" is a word making the feeling that we can understand. Hence, Locke's achievement should be honored.

Again, note that "secondary quantity" is a word that forms the foundation of dualism.

If so, we may affirmatively answer Problem 7.5, i.e.,

$$\text{Can the direction: "Descartes} \xrightarrow[\text{model-change}]{} \text{Locke" be regarded as progress?}$$

That is, we may assert that

$$\text{Plato} \xrightarrow[\text{model-change}]{\text{progress}} \text{Descartes} \xrightarrow[\text{model-change}]{\text{progress}} \text{Locke}$$

if "to make progress" is defined by "to come near quantum language" (*cf.* Assertion 1.5).

♠**Note 7.7.** By the way, Merleau-Ponty (1908 - 1961) might think in the following manner.

($\sharp_1$) I shake hands with my right hand and the left hand. In this case, if I regard the right hand as the measuring instrument, I feel the existence of my left hand. On the contrary, if I regard the left hand as the measuring instrument, I feel the existence of my right hand.

Such thing is worth arguing. If we do not start by gathering such example variety, Conjecture 7.6 "the relation between self-referential and scientific" cannot be solved. I do not know yet the meaning of the symmetry, i.e.,

($\sharp_2$) "right and left", "Geocentrism vs. Heliocentrism (*cf.* Sec. 6.3)"

7.6 Dramatic presentation of "British Empiricism vs. Continental Rationalism"

Modern philosophy became popular through the following rival relation:

British Empiricism vs. Continental Rationalism

That is,

$$\text{(A)}\quad \underset{\text{[The father of modern philosophy]}}{\boxed{\text{Descartes}}} \longrightarrow \left\{ \begin{array}{c} \underset{\text{[Locke, Berkeley, Hume]}}{\boxed{\text{British Empiricism}}} \\ \\ \underset{\text{[Leibniz]}}{\boxed{\text{Continental Rationalism}}} \end{array} \right\} \longrightarrow \underset{\text{[summing-up]}}{\boxed{\text{Kant philosophy}}}$$

Let us explain the above:

Modern philosophy

British Empiricism$\big[$**"tabula rasa"(= blank paper)**$\big]$
"An Essay concerning Human Understanding" (by Locke, 1690) says that

(B) He eliminated the possibility of innate knowledge before experience. Human being is born as the blank state ("tabula rasa") . (Locke, Berkeley, Hume, $\cdots$)

Continental Rationalism$\big[$**nativism**$\big]$
"New Essays on Human Understanding" (by Leibniz, 1703) says that

(C) nativism (= not "tabula rasa"). the human mind as it is at birth, with ideas or thoughts in it.

(Descartes, Leibniz,$\cdots$)

That is, from

"An Essay concerning Human Understanding" vs. "New Essays on Human Understanding"

the rival relation:

British Empiricism["tabula rasa"] vs. Continental Rationalism[nativism]

began. After nearly 100 years of twists and turns,

Appearance of Kant (Critique of Pure Reason: 1781)

And

(D) Kant has integrated "tabula rasa vs. nativism"

Such an outline is said generally.

(Notice) In this paper, we think that the above is only "model change" or "Repainting of signboard". However, we have the following Problem 7.5:

- Has Western philosophy been making progress?

This is answered throughout this paper.

7.6.1 Would Leibniz be serious for this argument (i.e., nativism) ?

Gottfried Wilhelm Leibniz (1646-1716) was one of the great thinkers of the seventeenth and eighteenth centuries and is known as the last "universal genius". He made deep and important contributions to the fields of metaphysics, epistemology, logic, philosophy of religion, as well as mathematics, physics, geology, jurisprudence, and history.

Everyone may have the following question:

(E) Why would such a genius participate in a nonsense argument (i.e., "nativism vs. tabula rasa") ?

It is clear that Locke's theory is too extreme, and thus, it is a matter of course that Leibniz was critical in "tabula rasa". However,

(F_1) The story that Leibniz got over Locke in "New Essays on Human Understanding" is too exaggerated.

The argument about "nativism vs. tabula rasa" is non-sense in the following sense:

(F_2) Even if future brain science will make a decision favorable to one of them (i.e., "nativism vs. tabula rasa"), it is independent of Leibniz's (or, Locke's) evaluation. That is because "Continental Rationalism vs. British Empiricism" is regarded as a problem less than science. What is the most important is to form the ground on which the dualistic idealism can be argued scientifically. Without the ground, it is useless even if they said something[1].

For the argument about "Continental Rationalism vs. British Empiricism" from the linguistic point of view, see Note 9.2 in Chap. 9.

Ordinary people may want to find the big name of "Genius Leibniz" in the debates of "British Empiricism vs. Continental Rationalism".

♠**Note 7.8. [What is space · time?]** Here, let us add Leibniz-Clarke Correspondence (1715–1716) (*cf.* ref. [1, 32]), which is important to know both Leibniz's and Clarke's (=Newton's) ideas concerning space and time.

($\sharp_1$) **[The realistic space-time]**
Newton's absolutism says that the space-time should be regarded as a receptacle of a "thing." Therefore, even if "thing" does not exits, the space-time exists.

On the other hand,

[1]For example, from the scientific point of view, atomism due to Democritus (BC.460-BC.370) is non-sense.

($\sharp_2$) **[The metaphysical space-time]**
Leibniz's relationalism says that

- Space is a kind of state of "thing".
- Time is an order of occurring in succession which changes one after another.

Therefore, if "thing" does not exit, the space-time does not exist.

Therefore, I regard this correspondence as

$$\underset{\text{(realistic view)}}{\boxed{\text{Newton } (\approx \text{ Clarke})}} \quad \underset{\text{v.s.}}{\longleftrightarrow} \quad \underset{\text{(linguistic view)}}{\boxed{\text{Leibniz}}}$$

which should be compared to

$$\underset{\text{(realistic view)}}{\boxed{\text{Einstein}}} \quad \underset{\text{v.s.}}{\longleftrightarrow} \quad \underset{\text{(linguistic view)}}{\boxed{\text{Bohr}}}$$

Many scientists may think that

> Newton's assertion is understandable, in fact, his idea was inherited by Einstein. On the other, Leibniz's assertion is incomprehensible and literary. Thus, his idea is not related to science.

However, recall the classification of the world-description (Assertion 1.1):

$$\begin{cases} \text{①} : \underset{\text{(realistic world view)}}{\text{Newton, Clarke}} \quad \cdots \overset{\text{(space-time in physics)}}{\underset{\text{"What is space-time?"}}{\boxed{\text{realistic space-time}}}} \quad \text{(successors: Einstein, etc.)} \\ \text{②} : \underset{\text{(linguistic world view)}}{\text{Leibniz}} \quad \cdots \overset{\text{(space-time in measurement theory)}}{\underset{\text{"How should space-time be represented?"}}{\boxed{\text{linguistic space-time}}}} \quad \text{(i.e., spectrum, tree (\textit{cf.} ref. [32]))} \end{cases}$$

in which Newton and Leibniz respectively devotes himself to ① and ②. Although Leibniz's assertion is not clear, we believe that

- Leibniz found the importance of "linguistic space and time" in science,

Also, it should be noted that

($\sharp$) Newton proposed the scientific language called Newtonian mechanics,
on the other hand,
Leibniz could not propose a scientific language

I want to believe that "realistic" vs. "linguistic" is always hidden behind the great disputes in the history of the world view. That is,

$$\boxed{\text{realistic world view}} \quad \underset{\text{v.s.}}{\longleftrightarrow} \quad \underset{\text{(idealistic)}}{\boxed{\text{linguistic world view}}}$$

(*cf.* Assertion 1.4 in Sec. 1.4).

♠**Note 7.9.** (*cf.* Note 7.6, Note 9.2) As mentioned later, considering "language" and nit "cognition", then, in several languages (ordinary language, mathematics, Newtonian mechanics, programing language, etc.), we say tat

(♯) mathematics is nativism

That is because mathematics is based on set theory Here it should be noted that set theory (= axiomatic set theory) is due to Kantor, Hilbert, Zermelo- Fraenkel, etc. And thus, it was completed in the early 20th century.

7.6.2 Subjective idealism: Berkeley, "To be is to be perceived"

7.6.2.1 Priest: Berkeley

Berkeley (1685 -1753) is famous as follows.

(G_1) Berkeley is a priest, and he interpreted Locke's primary quality as the state of things that come from a supernatural power such as a god. Thus his philosophy is called subjective idealism.

(G_2) Berkeley indicated that the mathematical definition of $\lim \frac{0}{0}$ is not complete

(G_3) He said "To be is to be perceived", which represented the essential spirit of dualism.

Summing up, Berkeley was always the standpoint of anti-Newton (= anti-realism).

- If we think that modern philosophy (from Descartes to Kant) has significance as a buffer zone of Christianity with Newtonian mechanics, we can conclude that Berkeley is honest.

The mathematical definition of $\lim \frac{0}{0}$ (i.e., (ϵ, δ)-definition of limit) was more important than Newton thought, and it was discovered one hundred and tens of years later (by Cauchy, Weierstrass, etc.). When I think from now on, there was a possibility that Leibniz discovered it, but he was busy in the other things.

7.6.2.2 (G_3): To be is to be perceived

Consider the following saying:

(H_1) There is no science without measurement
($\approx$ [To be is to be perceived])

Everyone may believe that this saying (H_1) is absolutely true. In fact, the importance of "measurement" is emphasized as follows (*cf.* Sec. 1.1).

$$\underset{\text{(=quantum language)}}{\boxed{\text{measurement theory}}} = \overset{\text{[Axiom 1]}}{\boxed{\text{measurement}}} + \overset{\text{[Axiom 2]}}{\boxed{\text{causal relation}}} + \underbrace{\boxed{\text{linguistic Copenhagen interpretation}}}_{\text{[the manual to use Axioms 1 and 2]}} \tag{7.2}$$

But, it is Genius Newton (and Einstein) that neglect this absolute truth (H_1). In fact, Newtonian mechanics is formulated as follows.

$$\boxed{\text{Newtonian mechanics}} = \boxed{\text{No measurement}} + \overset{\text{[Newtonian kinetic equation]}}{\boxed{\text{causal relation}}} \tag{7.3}$$

Here, note that Newton removed "measurement" from (7.2). The insightfulness of Newton is surprising. A genius isn't also confused by "the absolute maxim (H_1)".

The following is my fiction:

(H_2) "Exclusion of the measurement" is the conclusion that Newton repeats consideration and arrived at. However, Berkeley, the forerunner of anti-Newton, considered that the exclusion is a weak point of Newtonian mechanics. And he said

To be is to be perceived

If we think so, we can understand the following "realistic world description vs. linguistic world description".

7.6.2.3 "Einstein=Tagore Meeting" and "Bohr=Einstein debates"

Concerning "realistic world description vs. linguistic world description", Einstein=Tagore (poet, thinker in India) meeting in 1930 is famous, in which they asserted as

- Tagore: "Truth is always limited by human perception."
- Einstein: "Truth is independent of our consciousness, For instance, if nobody is in this house, yet that table remains where it is[2]."

In the above, Tagore's assertion is similar to Berkeley's "To be is to be perceived", which belongs to the situation of dualistic idealism(=linguistic world description).

On the other hand, Einstein's saying:

(I_1) if nobody is in this house, yet that table remains where it is (= Does the moon disappear when I'm not looking at it?)

[2]Einstein often said this kind of statement at various places, for example, "Does the moon disappear when I'm not looking at it?"

is the same as

(I_2) Truth is independent of us (= realistic world description)

Thus, Einstein and Newton are similar, in the sense that

Truth is independent of human being (i.e., physics holds without measurement)

Thus, it should be noted that (7.3) is significant.

In this paper, we are not concerned with Bohr=Einstein debates in quantum mechanics (in order to solve this problem, I proposed quantum language), (*cf.* ref. [32])). However, Bohr=Einstein debates is similar to the above. Thus, summing up, we see:

realistic world description vs. linguistic world description (*cf.* Table 1.1 in Assertion 1.4)

Realistic world description [monism; no measurement]	Linguistic world description [dualism; measurement]
Newton	Berkeley
Newton (and Clarke)	Leibniz
Einstein	Tagore
Einstein	Bohr

Now, concerning Bohr=Einstein debates, The impression that Einstein lost now has been left, but the author does not think so (*cf.* ref. [32]).

♠**Note 7.10.** Omitting "Newton vs. Berkeley" and "Einstein vs. Tagore" in the above table, I repeatedly mention the following table (*cf.* Assertion 1.4):

Realistic world description vs. linguistic world description (= Table 1.1 in Assertion 1.4)

dispute ＼ [R] vs. [L]	Realistic world description	Linguistic world description
ⓐ: motion	Hērakleitos	Parmenides
ⓑ:Ancient Greece	Aristotle	Plato
ⓒ: Problem of universals	Nominalism(Ockham)	Realism(Anselmus)
ⓓ: space-time	Newton (≈ Clarke)	Leibniz
ⓔ: quantum theory	Einstein	Bohr

ⓐ is my fiction, ⓒ is a confusion. ⓓ is the Leibniz=Clarke correspondence(*cf.* Note 7.8), ⓔ is Bohr=Einstein debates. Quantum language is proposed as one of answers to Bohr=Einstein debates(*cf.* ref. [32]).

7.6.3 Hume; skeptic who didn't measure, "A Treatise of Human Nature"

7.6.3.1 The review of Descartes

Let us review Descartes philosophy.

(J_1) Descartes found the indisputable truth, i.e., cogito proposition "I think, therefore I am". Therefore, everything derived from cogito proposition can be trusted. That is, he started from "the existence of I".

It is touched by a pureness of Descartes, but in the first place "I think, therefore I am" and "the existence of I" is suspicious (*cf.* Note 1.2 or, Note 7.3). Hence, the following is also suspicious:

(J_2) "The existence of I" is certain. **Therefore**, the matters that I perceive exist. And further, Descartes introduced "body (= sensor organ)" which mediates between "I" and "matter". After all, he reached and discussed "mind-matter dualism" (= Descartes problem 7.4), that is, "the problem of mind-matter dualism" and "mind-body problem".

Although Descartes problem 7.4 is, from the scientific point of view, a barren discussion, Descartes philosophy was supported a lot of people. Since the philosophy of world description is a kind of fashion or "model-change", to be supported by many people is the most important.

(J_3) If Descartes and Locke asserted that

- there is a possibility that mind-matter dualism (with keywords "matter", "I (= mind, brain)", "body(=secondary quality)", "matter") succeeds.

then, I think that they are, from the quantum linguistic point of view, true.

If so, we may affirmatively answer Problem 7.5, i.e.,

$$\text{Can the direction: "Descartes} \xrightarrow[\text{model-change}]{} \text{Locke" be regarded as progress?}$$

That is, we may assert that

$$\text{Plato} \xrightarrow[\text{model-change}]{\text{progress}} \text{Descartes} \xrightarrow[\text{model-change}]{\text{progress}} \text{Locke}$$

7.6.3.2 Hume's straying[Less than brain science]; Hume's wordplay

Descartes philosophy is a philosophy which has the risk of entering the science. In fact, Hume approached the zone of science.

In "A Treatise of Human Nature" (1739), Hume pointed out the leap in logic of **"Therefore"** in the above (J_2). As Hume says, it is sure that "the existence of matter" cannot be derived from "the existence of I"[3]. Also, it is not guaranteed that "matter I perceive" is equal to "true matter". Thus, the existence of "matter" is doubtful. However, it is sure that I feel so. Hume states that

(K) "a bundle of perceptions" (= brain circuit) exists

That is,

[3]This kind of logic is a typical self-reference (*cf.* Note 1.2 or, Note 7.3). Thus, Hume's logic (or generally, philosophical logic) in ordinary language cannot be trusted. That is, it is only a wordplay.

(L) "matter" and "causal relation" are a kind of bundle of perceptions

I think that the above "$(J_1)\to(K)\to(L)$" is self-referential in the wide sense. That is,

- "$(J_1)\to(K)\to(L)$" is a kind of psychological illusion as having been able to understand all events by the word "bundle of perceptions".

To enjoy such convinced form may also be a pleasure of philosophy. Thus,

(M) It is said Hume's philosophy is the goal of British Empiricism

Hume took the faultfinding of Descartes, and Hume has entered into wrong direction "brain science". The research of "the bundle of perceptions" belongs to brain science.

(N) If Hume was a scientist, he was too early for 300 years

The cause of victory of Galileo was a "telescope". Hume studied "brain science" without measuring instrument in spite that Hume thought that he himself is a philosopher and not scientist. Hence, I think that

$$\text{Descartes} \xrightarrow[\text{progress}]{} \text{Locke} \xrightarrow{\text{retrogression}} \text{Hume}$$

However, Hume was revived by Kant (this will be discussed in Note 7.11 and Chap. 8 [Kant]). Then, I want to say that

$$\text{Descartes} \xrightarrow[\text{progress}]{} \text{Locke} \xrightarrow[\text{progress}]{} \text{Hume} \xrightarrow[\text{progress}]{} \text{Kant}$$

♠**Note 7.11.** It is a matter of course that the representation of "causal relation" is the most important theme in world description. In Newtonian mechanics, the causality is represented by Newtonian kinetic equation. In Descartes=Kant philosophy, the representation of "causal relation" is as follows.

($\sharp_1$) **[Cognitive causality]:** David Hume, Immanuel Kant, etc. thought as follows. :

> We cannot say that "Causality" actually exists in the world, or that it does not exist in the world. And when we think that "something" in the world is "causality", we should just believe that the it has "causality".

Most readers may regard this as "a kind of rhetoric", however, several readers may be convinced in "Now that you say that, it may be so." Surely, since you are looking through the prejudice "causality", you may look such. This is Kant's famous "Copernican revolution", that is,

"recognition constitutes the world."

which is considered that the recognition circuit of causality is installed in the brain, and when it is stimulated by "something" and reacts, "there is causal relationship." Probably, many readers doubt about the substantial influence which this ($\sharp$) had on the science after it. However, in this book, I adopted the friendly story to the utmost to Kant.

($\sharp_2$) **[Linguistic causal relationship (MeasurementTheory)]:** The causal relationship of measurement theory (= quantum language) is decided by the Axiom 2 (causality; §1.1.1) of this chapter. If I say in detail,:

- Although measurement theory consists of the two Axioms 1 and 2, it is the Axiom 2 that is concerned with causal relationship. When describing a certain phenomenon in quantum language (i.e., a language called measurement theory) and using Axiom 2 (causality; §1.1.1) , we think that the phenomenon has causality.

♠**Note 7.12.** In the book "The astonishing hypothesis" (by F. Click (the most noted for being a co-discoverer of the structure of the DNA molecule in 1953 with James Watson)), Dr. Click said that

($\sharp_1$) *You, your joys and your sorrows, your memories and your ambitions, your sense of personal identity and free will, are in fact no more than the behavior of a vast assembly of nerve cells and their associated molecules.*

It should be note that this ($\sharp_1$) and the dualism do not contradict. That is because quantum language says (*cf.* Assertion 1.1):

($\sharp_2$) **Describe any monistic phenomenon by the dualistic language (= quantum language)!**

Also, if the above ($\sharp_1$) is similar to Hume's assertion, Hume was a pre-scientist rather than a philosopher. And further, this ($\sharp_2$) is familiar to most scientists. That is because they usually use statistics (or, probability theory), which is the dualism composed of "trial" ($\approx$ measurement).

♠**Note 7.13.** Here, we have (*cf.* Assertion 1.3[classification of philosophers]).

($\flat$)
- ($\flat_1$) : the realistic world description (physics)
  Aristotle, **Archimedes**, **Galileo**, **Newton**, Einstein, $\cdots$
- ($\flat_2$) : the fictional linguistic world description (main street of western philosophy)
  Plato, **Scholasticism**, **Descartes**, **Locke**, **Leibniz**, **Berkeley**, **Hume**, Kant, Husserl
- ($\flat_3$) : the scientific linguistic world description (statistics, quantum language)
  Parmenides, **Zeno J. Bernoulli**, statistics (Fischer, etc.), quantum language

Chapter 8

Kant

In this chapter, we discuss Kant in the flower of modern philosophy:

$$\underset{\text{[The father of modern philosophy]}}{\boxed{\text{Descartes}}} \longrightarrow \left\{ \begin{array}{c} \text{[tabula rasa, experience]} \\ \boxed{\text{British Empiricism}} \\ \text{[Locke, Berkeley, Hume]} \\ \\ \text{[a priori, nativism]} \\ \boxed{\text{Continental Rationalism}} \\ \text{[Leibniz]} \end{array} \right\} \longrightarrow \underset{\text{[summing-up]}}{\boxed{\text{Kant philosophy}}}$$

Kant completely followed Platonic method of telling philosophy (i.e., the fictional linguistic world description) as follows.

$$(\sharp) \qquad \underset{\text{preface, introduction, (fictional)premise, expedient}}{\boxed{\overset{\text{world is so}}{\text{fictional linguistic world description}}}} \xrightarrow{\text{therefore}} \underset{\text{main subject}}{\boxed{\overset{\text{you should do so}}{\text{ethics, morals}}}}$$

That is, Kant executed the following:

($\sharp_1$) [world is so] is secondary,
"Critique of Pure Reason (1781)":

($\sharp_2$) [you should do so] is main theme
"Critique of Practical Reason (1788)", "Critique of Judgment(1790)"

The reason why Kant got the highest possible evaluation is that Kant carried out the above.

8.1 "Surely You're Joking, Mr. Kant!": Antinomy

8.1.1 Three Critiques

Immanuel Kant (1724 - 1804) is one of the most influential philosophers in the history of Western philosophy. His main work is "Critique of Pure Reason (1781)", "Critique of Practical Reason (1788)", "Critique of Judgment(1790)", whose theme is respectively "truth" (i.e., "like truth" in the sense of this paper), "virtue", "beauty". That is, he followed Platonic method of telling philosophy as follows.

(A) "Critique of Pure Reason (1781)" fictional linguistic world description (preface, introduction, (fictional)premise, expedient) $\xrightarrow{\text{therefore}}$ "Critique of Practical Reason (1788)" "Critique of Judgment(1790)" ethics, morals (main subject)

Of course, the interest of this paper is concentrated to the world description (i.e., "Critique of Pure Reason"). Have said many times in this book, philosophy of the world description is only a "preface", thus, it might be immature. However,

(B) "Critique of Pure Reason" might be perfect as a preface.

♠**Note 8.1.** As mentioned frequently up to this point, the fictional linguistic world description is really "asserted fiction", however, we must pretend not to accept the fictional linguistic world description as "asserted fiction". That is because, if we accept it, the difference between philosophy and religion becomes fuzzy. Therefore, we must use the terms: "logic", "reason", etc. in the fictional linguistic world description. For example, "Critique of Pure Reason", "Tractatus Logico-philosophicus", etc. I think that Platonic method of telling philosophy (i.e., The fictional linguistic world description) is a desperate survival strategy for Western philosophy to co-exist with Christianity.

8.1.2 Antinomy

Kant asserted that

(C) There is a proposition P such that "P is true" and "P is not true"

And he called such a proposition antinomy.

Antinomy 8.1. [Four Antinomies]
Kant assert that he finds the following four antinomies:

(D_1) The world has a beginning in time, and is also limited as regards space.

(D_2) Every composite substance in the world is made up of simple parts, and nothing anywhere exists save the simple or what is composed of the simple.

(D_3) Causality in accordance with laws of nature is not the only causality from which the appearances of the world can one and all be derived. To explain these appearances it is necessary to assume that there is also another causality, that of Spontaneity.

(D_4) There belongs to the world, either as its part or as its cause, a being that is absolutely necessary.

[**Notice**] Propositions (D_1) $-$ (D_4) are only word play since the "logic" in ordinary language cannot be trusted, that is, it is not discussed under a certain world description. Thus, **the following proof is not worth reading.**
Proof of (D_1)

Although each proposition (i.e., $(D_1) - (D_4)$), for example, according to Kant, let us show that the proposition (D_1) concerning time is antinomy as follows.

1. If the world has no beginning, then for any time t an infinite series of successive states of things has been synthesized by t.
2. An infinite series cannot be completed through successive synthesis.
3. The world has a beginning (is limited in time).

Therefore, Kant concludes that

- The proposition (D_1) concerning time is antinomy □

At any rate, we want to say

"Surely You're Joking, Mr. Kant!"

As emphasized throughout this paper, we must again emphasize the importance of world descriptionism "Begin with the world description!" (*cf.* (B) in Sec.1.3.1). As pointed out by Zeno more than 2000 years ago,

we must not rely on the logic of ordinary language.

since **the logic of philosophy is comparable to (= resembles) the logic of detective stories.**

To put it concretely, philosophical puzzles appear in ordinary language as follows.

(E) Zeno's paradoxes (*cf.* Sec.2.4),
Aristotle's syllogism (*cf.* Sec.3.6.3),
Only "now" exists (*cf.* Sec.5.1),
Anselmus' "Arguments for the existence of God" (*cf.* Sec.5.4),
The difference between Geocentrism and Heliocentrism is not clear (*cf.* Chap.6),
Descartes' cogito proposition (*cf.* Sec.7.2),

If we say "Would Kant not understand this (E) at all?", Kant may answer as follows.

(F) "Critique of Pure Reason" as well as the theory of Ideas are kinds of prefaces. Main assertion is written in Critique of Practical Reason.

I guess that this is Kant's real intention.

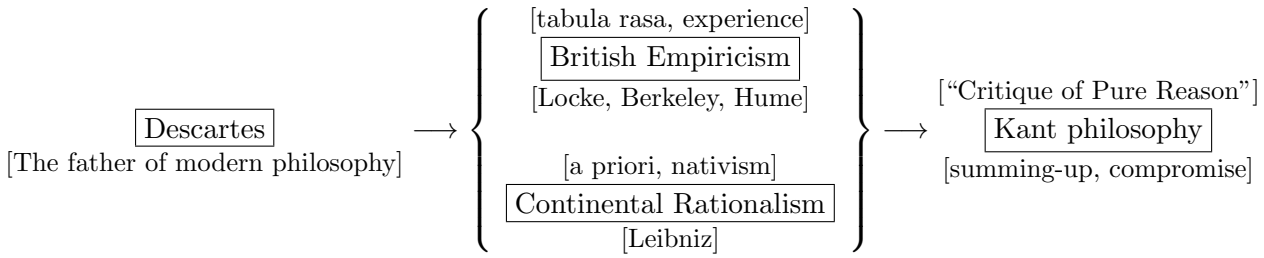
8.2 Kant's epistemology

8.2.1 Kant's compromise

Now, it is usually said that

(A) Kant's "Critique of Pure Reason" is a kind of compromise between Continental Rationalism and British Empiricism

That is,



The meaning of "compromise" is as follows.
A priori concept is, for example,

(B) sensibility (= space-time perception) and understanding (=thought)

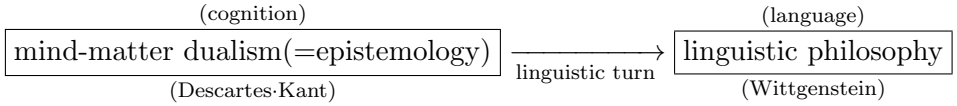
which is within Continental Rationalism and not "tabula rasa". But,

(C) Cognition, judgment is going to be formed gradually through the experience

which is similar to British Empiricism.

In this paper, we do not appreciate Kant's compromise. Our assertion is briefly mentioned in Note8.2 below:

♠**Note 8.2.** (= Note 9.2) Consider "language" and not "cognition". That is, consider the following linguistic turn (*cf.* Chap.9):



Then, in several languages (ordinary language, mathematics, Newtonian mechanics, programing language, etc.), we say tat

($\sharp_1$) "ordinary language" is like tabula rasa (i.e.,British Empiricism)(*cf.* Note 7.6)

($\sharp_2$) Mathematics is like Continental Rationalism(*cf.* Note 7.9)

($\sharp_3$) **quantum language is like Kant's compromise**

This will be again discussed in Note 9.2 in Chap.9.

8.2.2 Thing-in-itself, Copernican revolution; from copy theory to constitution theory

Kant thought that

(D) We can understand the "world" only through the human perception. Also, cats can understand the "world" only through the cat perception. Thus,

There is "cat's world" for cats. and further, there is "butterfly's world" for butterflies.

If there are aliens whose cognition ability is finer than ours, their world is different ours. Although the difference of the worlds is made by that of the cognition ability, it is sure there exists something, which is called "thing-in-itself" by Kant.

That is, Kant thought as follows.

- we do not perceive the world such as copy, but we perceive the world such as it is constituted by cognition ability.

That is, Kant proposed so called Copernican revolution such that

from "copy theory" to "constitution theory"

namely,

(E) not "The world is previous, recognition is later" but "Recognition is previous, the world is later"

♠**Note 8.3.** As said in the linguistic Copenhagen interpretation (E_3) in Sec. 1.1.2, "measuring instrument" is superior to "matter (= thing-in itself)". Recall Barkeley's saying:

- To be is to be perceived.

which is similar to "Recognition is previous, the world is later"

8.2.3 "Critique of Pure Reason (1781)" The outline extracted from Microsoft Encarta (2009)

This section is the preparation of next chapter 9.

Explanation 8.2. (The preparation of Explanation 9.1 in Chap.9)
"Critique of Pure Reason (1781)" : Extracted from Microsoft Encarta (DVD version, Japanese (2009)

What was revealed in [Critique of Pure Reason] is that human [perception ability] is not just to passively replicate things of the world. Rather it acts on the world actively and creates the subject of its [recognition]. Even though we make it, the world is not necessarily completed from nothing as God did. The world is already there in some form. In order for [recognition] to be established, information from this world that can be obtained through a sense is necessary as a material. However, this information is only disorganized confusing as it is. Human [perception ability] gives an orderly order to information of this confused sensation through a certain form that is inherent in human beings. It is necessary to compile the subject of unified [recognition] for the first time.

According to [Kant], its format (= [a priori synthetic judgment]) is as follows.

(i) [Form of sensitivity(intuition)(Space-time ($=\mathbf{R}\times\mathbf{R}^3$))]

(ii) [Form of understanding(thinking)]

If so, the proposition that "everything is in time and space" or "everything follows causality" cannot be proved empirically. Nevertheless, it will apply unconditionally to all subjects of experience. The reason is that the object is composed for the first time in a format such as [space, time, causality, etc.]. For example, [if we wear green sunglasses], the remark that "the world is green" is similar to being regarded as a correct remark for all human beings.
(MSN (the Encarta encyclopedia. 2009 DVD Japanese version(translated by the author))).

In the scientific sense, the above is meaningless, or it does not reach the level of the publication. However, applying the following linguistic turn (*cf.* Chap.9) to above, that is,

(F) $\overset{\text{(cognition)}}{\boxed{\text{mind-matter dualism(=epistemology)}}}_{\text{(Descartes·Kant)}} \xrightarrow[\text{linguistic turn}]{} \overset{\text{(language)}}{\boxed{\text{linguistic philosophy}}}_{\text{(Wittgenstein)}}$

the above becomes big theory from the philosophical and scientific point of view, (*cf.* Explanation 9.1 in Chap.9).

At any rate, Kant proposed the Copernican revolution:

(G) $\boxed{\text{Copy theory}}$ (the world is previous, recognition is later) $\xrightarrow[\text{Copernican revolution}]{}$ $\boxed{\text{Constitution theory}}$ (recognition is previous, the world is later)

Summing-up, we consider that the following is the standard of western philosophy:

(I) the world is composed and described by our selfish convenience.

In fact, Plato composed the theory of Ideas by Socrates' convenience.

We think that

(J) **using the term "Copernican revolution", Kant prevented that epistemology enters into the zone of brain science.**

Naming of "Copernican revolution" does not mean that self-congratulation of Kant. I'd like to believe that strong intention of Kant which says "Epistemology is not science, but philosophy.", is included in the term: "Copernican revolution".

As mentioned in Chap.9, we believe that

(K) epistemology should enter into the zone of language and not brain science.

♠**Note 8.4.** Physics and science make up a theory while making modifications by the result of the experiment. Thus, physics and science can expect sound development. On the other hand, the philosophy of world description is metaphysics, which cannot be determined by experiments. Thus, the question "Did the philosophy of world description make a progress?" is not easy to answer. That is because, if we consider that

- the western philosophy was able to keep freshness for a long time by renewing a preface part of world description such as the model change of a car.

then, we must conclude that the philosophy of world description does not make a progress. However, in this paper, we assert that

($\sharp_1$) the philosophy of world description has been making a progress. And moreover, it finally converges to quantum language.

More precisely, we assert that

($\sharp_2$) If "to make progress" is defined by "to come near quantum language" (*cf.* Assertion 1.5), then the philosophy of world description has been making a progress.

8.3 Summary ; Descartes=Kant philosophy

8.3.1 Before Kant

Every thing started from Descartes figure(=Figure 1.1=Figure 7.1), i.e., "mind", "body", "matter". For example, in "An Essay Concerning Human Understanding (1689)", Locke might think as follows.

(A) In the field of "matter" of Descartes figure, activity of Newton is remarkable. However, concerning the relation among "I"(="brain", "mind"), "body"(="sensory organ"), "matter", he wanted to reach the summit.

Leibniz (in "The human being intelligence new discussion"1703) which advocated an objection in Locke can also be conscious of Newton. After all, Unproductive confrontation structure "Locke vs. Descartes·Leibniz" began. That is,

$$\underset{\text{[Locke, Berkeley, Hume]}}{\overset{\text{[tabula rasa, experience]}}{\boxed{\text{British Empiricism}}}} \quad \text{vs.} \quad \underset{\text{[Descartes, Leibniz]}}{\overset{\text{[a priori, nativism]}}{\boxed{\text{Continental Rationalism}}}}$$

And further, through Berkeley, Hume, modern philosophy had been flowering as follows.

$$\underset{\text{[The father of modern philosophy]}}{\overset{\text{["Discourse on the Method"]}}{\boxed{\text{Descartes}}}} \longrightarrow \left\{ \begin{array}{c} \underset{\text{[Locke, Berkeley, Hume]}}{\overset{\text{[tabula rasa, experience]}}{\boxed{\text{British Empiricism}}}} \\ \\ \underset{\text{[Leibniz]}}{\overset{\text{[a priori, nativism]}}{\boxed{\text{Continental Rationalism}}}} \end{array} \right\} \longrightarrow \underset{\text{[summing-up]}}{\overset{\text{["Critique of Pure Reason"]}}{\boxed{\text{Kant philosophy}}}}$$

According to Platonic method of telling philosophy (*cf.* (G) in Sec. 1.3), we may expect the following:

(B): The fictional linguistic world description (western philosophy)

The fictional linguistic world description (=How to tell philosophy due to Plato) is as follows.

(B) $\underset{\text{preface, introduction, (fictional)premise, expedient}}{\overset{\text{world is so}}{\boxed{\text{fictional linguistic world description}}}} \xrightarrow{\text{therefore}} \underset{\text{main subject}}{\overset{\text{you should do so}}{\boxed{\text{ethics, morals}}}}$

Therefore,

(B_1) [world is so] is secondary,

(B_2) [you should do so] is main theme

In spite of the above (B_1), we think that

(C) In modern philosophy, philosophers might be too eager to the preface (i.e., fictional linguistic world description).

This might be due to the fact that rivalry to Newtonian mechanics was too strong. Or, Christianity might hope that modern philosophy played a role of rivalry to Newtonian mechanics.

8.3.2 The inevitability of Kant's appearance

We think that

when it comes to the 1770s, the expiration date of epistemology was running out.

Therefore, many people might want to say

(D) Newtonian mechanics moved the world. Does the world move by epistemology? It was too early for 300 years? After all, is the "epistemology" important or not ?

Thus,

(E) **Someone, please finish the epistemology nicely!**

This is the atmosphere of 1770's, in which Kant appeared. Kant theory was the conclusion declaration named "unification".

(F) Greatness of Kant is to have prevented that epistemology faces the direction of the brain science by the showy name called "Copernican revolution".

That is, Kant understand that, even if the epistemology is clarified by the brain science, this is non-sense from the philosophical point of view.

Thus, Kant follows Platonic method of telling philosophy such that

(G) $\underset{\text{preface, introduction, (fictional)premise, expedient}}{\overset{\text{"Critique of Pure Reason (1781)"}}{\boxed{\text{fictional linguistic world description}}}} \xrightarrow{\text{therefore}} \underset{\text{main subject}}{\overset{\text{"Critique of Practical Reason (1788)" "Critique of Judgment(1790)"}}{\boxed{\text{ethics, morals}}}}$

This implies the end of Grand Narratives (i.e., epistemology), and the start of "one phrase philosophy (i.e., the philosophy of proverb)" such as

(H_1) Bentham(1789): "the greatest happiness of the greatest number"

(H_2) Hegel (1770 - 1831) : "thesis-antithesis-synthesis"

(H_3) Darwin(1809 - 1882) :"the survival of the fittest"

(H_4) Nietzsche(1844 - 1900) : "God is dead"

♠**Note 8.5.** The epistemology was completed by Kant. However, it is not based on experiment, thus, no wonder was a reckless attempt to further develop the epistemology of Kant. Husserl attempted to associate Kant's epistemology with psychology. It is sure that psychology is a good science. But, I do not think his theory was successful. That is, I think that the foundationalism based on cognition is a kind of self-reference.

Thus, we consider that

- $\boxed{\text{Kant}} \xrightarrow[\text{retrogression}]{} \boxed{\text{Hussal}}$

if "to make progress" is defined by "to come near quantum language" (*cf.* Assertion 1.5).

♠**Note 8.6.** Here, we have (*cf.* Assertion 1.3[classification of philosophers]).

$$(\flat)\begin{cases} (\flat_1): \text{the realistic world description (physics)} \\ \quad \textbf{Aristotle}, \textbf{Archimedes}, \textbf{Galileo}, \textbf{Newton}, \text{Einstein}, \cdots \\ (\flat_2): \text{the fictional linguistic world description (main street of western philosophy)} \\ \quad \textbf{Plato}, \textbf{Scholasticism}, \textbf{Descartes}, \textbf{Locke}, \textbf{Leibniz}, \textbf{Berkeley}, \textbf{Hume}, \textbf{Kant}, \textbf{Husserl} \\ (\flat_3): \text{the scientific linguistic world description (statistics, quantum language)} \\ \quad \textbf{Parmenides}, \textbf{Zeno J. Bernoulli}, \text{statistics (Fischer, etc.)}, \text{quantum language} \end{cases}$$

Chapter 9

Linguistic philosophy

The epistemology was completed by Kant. Or equivalently, the expiration date of epistemology has expired in Kant era. From the quantum linguistic point of view, we consider that the next developement is was directed by Wittgenstein, i.e., the linguistic philosophy. After all, we say, roughly speaking, that the history of the philosophy of world description is summarized as follows.

$$\underset{\text{(Plato)}}{\boxed{\text{the theory of Ideas}}} \xrightarrow[\text{cogito turn}]{} \overset{\text{(cognition)}}{\boxed{\text{mind-matter dualism}}}_{\text{(Descartes·Kant)}} \xrightarrow[\text{linguistic turn}]{} \overset{\text{(language)}}{\boxed{\text{linguistic philosophy}}}_{\text{(Wittgenstein)}} \tag{9.1}$$

9.1 Linguistic turn

9.1.1 Dr. Hawking and Ludwig Wittgenstein (1889 - 1951)

Dr. Hawking said in his best seller book [7]:

(A) Philosophers reduced the scope of their inquiries so much that Wittgenstein the most famous philosopher this century, said "The sole remaining task for philosophy is the analysis of language." What a comedown from the great tradition of philosophy from Aristotle to Kant!

This implies that

(B) No philosophers who can explain Wittgenstein's philosophy to an excellent scholar like Dr. Hawking are in all over the world.

That is because, if someone can do it, it is sure that Dr. Hawking has ears to hear.

9.1.2 Wittgenstein "Tractatus Logico-Philosophicus"

After studying with Bertrand Russell, Wittgenstein (1889 - 1951) wrote the "Tractatus Logico-Philosophicus (1921)", which explores the relationship of language to the world. He was a major influence on logical positivism but later repudiated this, and in "Philosophical Investigations (1953)" he argues that philosophical problems arise from insufficient attention to the variety of

natural language use. As said frequently in this paper, we also note that philosophical problems arise from the lack of world descriptionism (and "self-reference").

Contemporary great theories are as follows:

(C_1) Einstein's general theory of relativity (1916)

(C_2) Heisenberg, Schrödinger, Born : quantum mechanics (1925,6)

(C_3) Fischer: "Statistical Methods for Research Workers" in statistics(1925)

(C_4) Gödel's incompleteness theory (1930)

(C_5) von Neumann: 『Mathematical foundations of quantum mechanics (1932)

(C_6) A. N. Kolmogorov: Foundations of the theory of probability (1933)

(C_7) J. M. Keynes, Macro economics (1936)

Although Wittgenstein's "Tractatus Logico-Philosophicus" is famous, I think that it does not reach the level of the above (C_1)-(C_7). That is because

(D) it is sure that the above (C_1)-(C_7) are comprehensible for any ordinary scholar. On the other hand, "Tractatus Logico-Philosophicus" is incomprehensible for a excellent scholar like Dr. Hawking.

In other words, I believe that a good theory must be comprehensible for everyone[1].

9.2 The power of Wittgenstein's word

However, in this paper, we want to assert that Wittgenstein is one of the greatest philosophies (Plato, Descartes, Kant, etc.). That is because he proposed the following sayings (E_1) - (E_3):

(E_1) "The limits of my language mean the limits of my world."

(E_2) "What we cannot speak about we must pass over in silence"

(E_3) "Language-game"

The above is just the spirit of quantum language. Instead of my poor explanation of the spirit of quantum language, I prefer to saying

(F) "I claim as well as Wittgenstein the above (E_1) - (E_3)"

However, we have to pay our attention to the term "my language" in(E_1). That is, we have the following question:

(G) What is "my language"?

Wittgenstein could not answer this question. Thus, when Dr. Hawking said (A), that is,

(H) Wittgenstein said "The sole remaining task for philosophy is the analysis of language." What a comedown from the great tradition of philosophy from Aristotle to Kant!

[1]Strictly speaking, among the theory of Ideas, Descartes philosophy, Kant philosophy and quantum language, only quantum language is comprehensible.

many philosophers cannot contradict Hawking's opinion. After all, we think that

- although Wittgenstein could not propose his language[2]. Thus I want to think that he prepared the wise sayings (E_1) - (E_3) for quantum language.

9.3 The linguistic turn of "Critique of Pure Reason"

Contemporary, a severe evaluation may be given to the modern philosophy (i.e., the world description: from Descartes to Kant)). In fact, most people may today think that

(A) modern philosophy is only the self-referential word play without experiment. It may not be bad to enjoy this word play. However, if someone wants to understand cognition, he/she should study the brain science.

♠**Note 9.1.** By the philosophical consideration (i.e., without experiment), we may develop Kant philosophy in two next directions:

($\sharp_1$) According to the linguistic turn of Kant epistemology, we make a language (i.e., quantum language).

($\sharp_2$) As mentioned in Conjecture 7.6, we want to clarify the meaning of "self-reference".

($\sharp_1$) is realized by quantum language. ($\sharp_2$) may be unsolved.

9.3.1 Batch conversion (from Critique of Pure Reason to quantum language)

A severe evaluation may be given to Critique of Pure Reason, which revives by the linguistic turn (due to Wittgenstein, etc), i.e.,

$$\underset{\text{Descartes=Kant}}{\overset{\text{transcendent}}{\boxed{\text{epistemology}}}} \xrightarrow[\text{linguistic turn}]{} \underset{\text{Wittgenstein}}{\overset{\text{language game}}{\boxed{\text{linguistic philosophy}}}}$$

That is, it suffices to change "cognition" (in Critique of Pure Reason)) to "language", that is,

$$\boxed{\text{"cognition"}} \xrightarrow{\text{batch conversion}} \boxed{\text{"language"}}$$

by which "the spirit of Critique of Pure Reason" changes to "the spirit of quantum language" as follows.

Explanation 9.1. (Continued from Explanation 8.2 in Chap.8)
Explanation of the spirit of quantum language : i.e., from Critique of Pure Reason to quantum language (*cf.* [21])

[2] The success of physics is due to the proposal of language, for example, the language called Newtonian mechanics, the language called the theory of relativity, etc.

That is, read such as

$$\underset{\text{[Explanation 8.1]}}{\textbf{[Explanation 9.1]}}, \quad \text{i.e.,} \quad \underset{\text{[the outline of "Critique of Pure Reason"]}}{\text{[the spirit of quantum language]}}$$

What was revealed in [Quantum language$^{\text{[Critique of Pure Reason]}}$] is that human [linguistic ability$^{\text{[perception ability]}}$] is not just to passively replicate things of the world. Rather it acts on the world actively and creates the subject of its [language$^{\text{[recognition]}}$]. Even though we make it, the world is not necessarily completed from nothing like God. The world is already there in some form. In order for [description$^{\text{[recognition]}}$] to be established, information from this world that can be obtained through a sense is necessary as a material. However, this information is only disorganized confusing as it is. Human [linguistic ability$^{\text{[perception ability]}}$] gives an orderly order to information of this confused sensation through a certain form that is inherent in human beings. It is necessary to compile the subject of unified [language$^{\text{[recognition]}}$] for the first time. According to [quantum language$^{\text{[Kant]}}$], its format (= [Axioms 1 and 2$]^{\text{[a priori synthetic judgment]}}$) is as follows.

(i) [Axioms 1 (measurement) $]^{\text{[Form of sensitivity(intuition)(Space-time (=}\mathbf{R}\times\mathbf{R}^3\text{))]}}$

(ii) [Axioms 2 (Causality)$]^{\text{[Form of understanding(thinking)]}}$

If so, the proposition that "everything is in time and space" or "everything follows causality" cannot be proved empirically. Nevertheless, it will apply unconditionally to all subjects of experience. The reason is that the object is composed for the first time in a format such as [measurement$^{\text{[space, time, causality, etc.]}}$, causality]. For example, [we know the only term "green"$^{\text{[if we wear green sunglasses]}}$], the remark that "the world is green" is similar to being regarded as a correct remark for all human beings.

♠**Note 9.2.** (=Note 8.2) Consider "language" and not "cognition". That is, consider the following linguistic turn:

$$\underset{\text{(Descartes·Kant)}}{\boxed{\text{mind-matter dualism(=epistemology)}^{\text{(cognition)}}}} \xrightarrow[\text{linguistic turn}]{} \underset{\text{(Wittgenstein)}}{\boxed{\text{linguistic philosophy}^{\text{(language)}}}}$$

Then, in several languages (ordinary language, mathematics, Newtonian mechanics, programing language, etc.), we say tat

($\sharp_1$) "ordinary language" is like tabula rasa (i.e.,British Empiricism)(*cf.* Note 7.6)

($\sharp_2$) Mathematics is like Continental Rationalism(*cf.* Note 7.9)

($\sharp_3$) **quantum language is like Kant's compromise**

In quantum language (*cf.* Sec.1.1), Axioms (measurement and causality) are first declared, and thus, quantum language is not like "tabula rasa". However, the linguistic Copenhagen

interpretation is going to be formed gradually through the experience, thus, quantum language is like Kant's compromise. As seen in the formula (1.1) in Chap. 1, we see that

$$\underset{\text{(=quantum language)}}{\boxed{\text{measurement theory}}} = \underset{\text{[Axiom 1]}}{\boxed{\text{measurement}}} + \underset{\text{[Axiom 2]}}{\boxed{\text{causal relation}}}$$

$$+ \underbrace{\boxed{\text{linguistic Copenhagen interpretation}}}_{\text{[the manual to use Axioms 1 and 2]}}$$

♠**Note 9.3.** If "Why is our cognition possible?" is asked, then, we may have only answer such that "Wonder of the human recognition ability", which is represented by "transcendent" (due to Kant). And moreover, If "Why is our language possible?" is asked, then, we may have only answer such that "Wonder of the human language ability", which is represented by "language game" (due to Wittgenstein). That is,

$$\underset{\text{Kant}}{\overset{\text{transcendent}}{\boxed{\text{epistemology}}}} \xrightarrow[\text{linguistic turn}]{} \underset{\text{Wittgenstein}}{\overset{\text{language game}}{\boxed{\text{linguistic philosophy}}}}$$

Chapter 10

The summary of this paper

Lastly, we summarize this paper. We concentrate ourselves to the fictional linguistic world description as follows:

$$\boxed{\text{the theory of Ideas}}_{\text{(Plato)}} \xrightarrow[\text{cogito turn}]{} \overset{\text{(cognition)}}{\boxed{\text{mind-matter dualism}}}_{\text{(Descartes·Kant)}} \xrightarrow[\text{linguistic turn}]{} \overset{\text{(language)}}{\boxed{\text{linguistic philosophy}}}_{\text{(Wittgenstein)}} \tag{10.1}$$

As mentioned in the preface, our main problems are as follows.

($\sharp_1$) Did the history (10.1) make progress? Or what is the measure of "progress"?

($\sharp_2$) Why has useless philosophies in (10.1) been prospering? Or Why did Western philosophy prosper only in the West?

The answers are summarized in this chapter.

10.1 The world descriptionism

10.1.1 The location of quantum language in the philosophy of world description

Assertion 10.1. (= Assertion 1.2) [The location of quantum language in the history of world-description (*cf.* ref.[14, 32])]

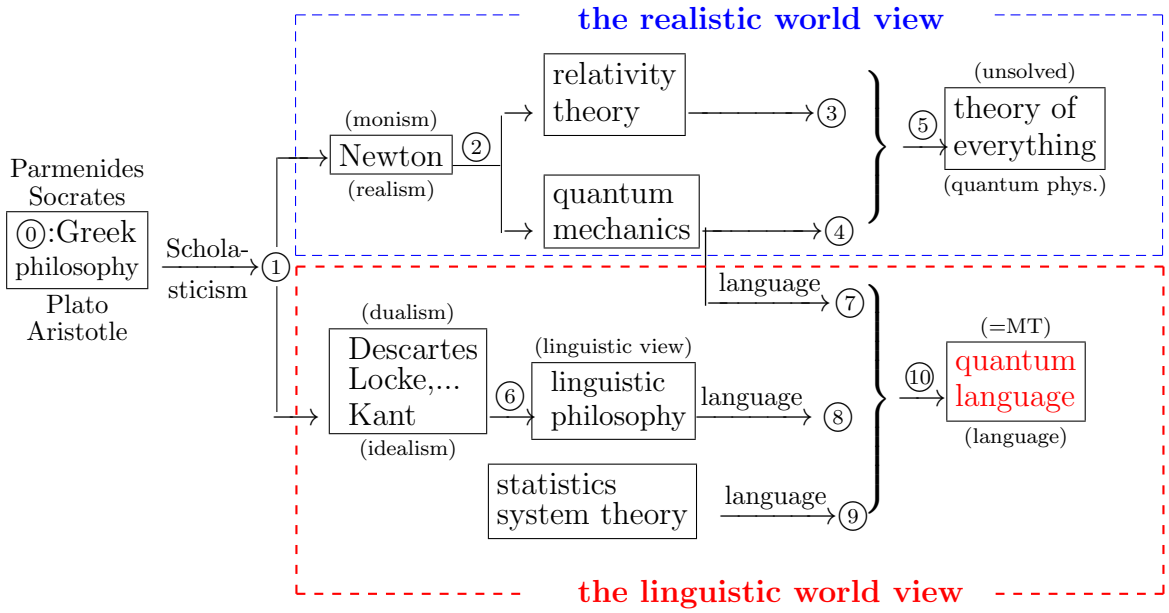


Figure 10.1: The history of the world-description

This figure is all of quantum language. That is, as mentioned throughout this paper, our understanding of history of western philosophy:

- [⓪→ ①→ ⑥→ ⑧→ ⑩]

is a direct consequence of this figure.

10.1.2 The world descriptionism (*cf.* Sec.1.3.1)

In order to explain Assertion 11.1, let us start from the world descriptionism (*cf.* Sec.1.3.1). The world descriptionism is the spirit such as

"Starts from world description!"

That is,

(A): The world descriptionism

The world descriptionism has the following form:

(B) $\underset{\text{premise}}{\boxed{\overset{\text{world is so}}{\text{world description}}}} \xrightarrow{\text{therefore}} \underset{\text{subject}}{\boxed{\overset{\text{conclusion}}{\text{discussions, calculation, logic, properties}}}}$

That is, the spirit such that "Start from world description"
(Notice) This is not trivial. That is because the above (B) says that the world description is greater than logic. Arguing repeatedly in this paper, we consider that the ignoring of the world descriptionism causes that philosophy falls into a blind alley.

We must not rely on the logic of ordinary language. To put it concretely, philosophical puzzles appear in ordinary language as follows.

- Zeno's paradoxes (*cf.* Sec.2.4),
  Aristotle's syllogism (*cf.* Sec.3.6.3),
  Only "now" exists (*cf.* Sec.5.1),
  Anselmus' "Arguments for the existence of God" (*cf.* Sec.5.4),
  The difference between Geocentrism and Heliocentrism is not clear (*cf.* Chap.6),
  Descartes' cogito proposition (*cf.* Sec.7.2),
  Kant's antinomies (*cf.* Antinomy 8.1)
  Heisenberg's uncertainty principle (*cf.* ref. [8, 32])

These are due to the ignoring of the world descriptionism.

10.1.3 Three kinds of world descriptions

There are three kinds of world descriptions as follows.

Assertion 10.2. (=Assertion 1.3) [realistic world description?, (fictional, scientific)linguistic world description? The classification of philosophers] We consider the following classification of philosophers.

$$(\flat)\begin{cases}(\flat_1)\text{:realistic world description (physics)}\\ \quad \text{Aristotle, Archimedes, Galileo, Newton, Einstein, } \cdots\\ (\flat_2)\text{:fictional linguistic world description (Western philosophy)}\\ \quad \text{Plato, Scholasticism, Descartes, Locke, Leibniz, Berkeley, Hume, Kant, Husserl}\\ (\flat_3)\text{:scientific linguistic world description (statistics, quantum language)}\\ \quad \text{Parmenides, Zeno, J. Bernoulli, statistics (e.g., Fischer), quantum language}\end{cases}$$

(Notice) The $(\flat_1)$ is related to monism. On the other hand, The $(\flat_2)$ and $(\flat_3)$ are related to dualistic idealism (= dualistic methaphysics). We assume that quantum language is the only one successful dualistic idealism (*cf.* Conjecture 11.2).

10.2 The fictional linguistic world description

10.2.1 The fictional linguistic world description

Next, we discuss the main theme (i.e., the fictional linguistic world description) as follows.

Summary 10.3. :The fictional linguistic world description (= the main current of western philosophy)

Let us review Platonic method of telling philosophy (=fictional linguistic world description, *cf.* Sec. 1.3.4). The fictional linguistic world description is the world description like Plato's theory of Ideas. Thus, it is also called Platonic method of telling philosophy. That is,

(B_1) The fictional linguistic world description is the world description as the preparation (i.e.,

premise, preface) of main assertion concerning ethics

That is,

$$(B_2)\qquad \underset{\substack{\text{world is so}\\ \text{preface, introduction, (fictional)premise, expedient}}}{\boxed{\text{fictional linguistic world description}}} \xrightarrow{\text{therefore}} \underset{\substack{\text{you should do so}\\ \text{main subject}}}{\boxed{\text{ethics, morals}}}$$

Here, it should be noted that

(C_1) [world is so] is secondary,

(C_2) [you should do so] is main theme

Under the Christian strong influence, it could not be free to discuss the ethics. And thus, western philosophy devoted itself to the preface (i.e., world description) than the main subject (i.e., ethics). If we do not consider so, we cannot explain the fact useless western philosophy lasted for 2500 years. (Here, "useless" means " scientifically useless").

Literature has various genres. As an example, it is a love story, a detective story, SF (science fiction), poetry, nonfiction. In the same sense, the fictional linguistic world description is a kind of literature. For example, its title is "The theory of Ideas", "Discourse on the Method ", "Critique of Pure Reason" etc. **It should be noted that there is never a case that the fictional linguistic world description remarked on truth.**

Usually, the department of philosophy belongs to the faculty of literature at most universities. This fact may be due to the above reason.

"Logic" is various. For example we think that

(D) The logic in philosophy (i.e., in the fictional linguistic world description) is similar to the logic in detective story

It is not being talked about by a negative nuance. If there is a philosophy which is logical or mathematical, then I think that it is not a good philosophy.

10.2.2 The history of the fictional linguistic world description

Roughly speaking, the history of the fictional linguistic world description is as follows:

$$\underset{\text{(Plato)}}{\boxed{\text{the theory of Ideas}}} \xrightarrow[\text{cogito turn}]{} \underset{\text{(Descartes·Kant)}}{\overset{\text{(cognition)}}{\boxed{\text{mind-matter dualism}}}} \xrightarrow{\text{linguistic turn}} \underset{\text{(Wittgenstein)}}{\overset{\text{(language)}}{\boxed{\text{linguistic philosophy}}}} \tag{10.2}$$

which is, in a phrase, said by Whitehead(1861 - 1947) as follows.

- Western philosophy is characterized as a series of footnotes to Plato.

That is, (10.2) implies that

- Platonic method of telling philosophy was a main current of western philosophy for about 2500 years in what follows.

$$\text{Socrates·Plato} \to \text{Scholasticism} \to \text{Descartes} \to \text{Locke} \to \text{Kant} \to \text{Wittgenstein}$$

Let us explain this as follows.

(E_1) **[Socrates·Plato (*cf.* Chap. 3)]:** Platonic method of telling philosophy started from Plato's theory of Ideas. In Plato philosophy, the theory of Ideas is completely an allegory, and the main theme is Socrates' ethics. Also, it should be noted that Socrates' "I know that I know nothing" is a kind of self-reference.

(E_2) **[Medieval Ages (*cf.* Chap. 5)]:** Also, in cases of Augustinus and Scholasticism, ethics is of course due to Christianity. Therefore, their world description are only short talks or, tricky puzzles, which is faint story to attract people's interests. For example, Augustinus' time theory (subjective time) is a kind of self-reference. And further, Scholasticism (i.e., Problem of universals: "Plato or Aristotle") might be a tool for priests to pretend to be intellectuals.

(E_3) **[Descartes (*cf.* Chap. 7)]:** When it was modern times after the Age of Geographical Discovery or the Renaissance, allegory and short talk were not enough for world description. Descartes used self-referential proposition "I think, therefore I am", and proposed Descartes philosophy (mind-matter dualism). Although he did not sufficiently research ethics (he might think that Christianity is enough for ethics), it is certain that the following model-change is the greatest in the history of wester philosophy:

$$\underset{\text{(Plato)}}{\boxed{\text{the theory of Ideas}}} \xrightarrow[\text{cogito turn}]{\text{model-change}} \overset{\text{(cognition)}}{\underset{\text{(Descartes)}}{\boxed{\text{mind-matter dualism}}}}$$

(E_4) **[Locke, Leibniz,...,Kant (*cf.* Chaps. 7,8)]:** Rivalries to Newtonian mechanics might lead Locke, Leibniz and so on to precise discussion about the world description. Descartes mind-matter dualism was understood as epistemology. Note that recognition is a scientific theme in brain science after 300 years. Therefore, precise argument might imply blind alley. However, it is sure that argument became lively. And thus, the following flower of modern philosophy was realized:

$$\underset{\text{[The father of modern philosophy]}}{\boxed{\text{Descartes}}} \longrightarrow \left\{ \begin{array}{c} \text{[tabula rasa, experience]} \\ \boxed{\text{British Empiricism}} \\ \text{[Locke, Berkeley, Hume]} \\ \\ \text{[a priori, nativism]} \\ \boxed{\text{Continental Rationalism}} \\ \text{[Leibniz]} \end{array} \right\} \longrightarrow \underset{\text{[summing-up]}}{\overset{\text{[Copernican revolution]}}{\boxed{\text{Kant philosophy}}}}$$

The epistemology was a too early scientific theme. Thus, there was danger which falls into the next traps.

($\sharp_1$) doing science without experiment

($\sharp_2$) enjoying the self-referential trick such as "return every phenomenon to recognition"

Without falling the traps, Kant could propose his philosophy, i.e., "Copernican revolution". In this sense, Platonic method of telling philosophy was completed by Kant philosophy.

(E_5) **[Christianity]:** The main part (i.e., ethics) overlapped with Christianity, and thus, the main part is restricted. The western philosophy was able to keep freshness for a long time by renewing a preface part of world description. This is similar to the model change of a car. It should be noted that this idea (i.e., a model change of philosophy) was not realized in the East. When I thought now, Platonic method of telling philosophy might be a desperate strategy for western philosophy to coexist with Christianity. Kant philosophy kept a good balance of the preface part and the main part such as

- "Critique of Pure Reason (1781)" fictional linguistic world description (preface, introduction, (fictional)premise, expedient) $\xrightarrow{\text{therefore}}$ "Critique of Practical Reason (1788)" "Critique of Judgment(1790)" ethics, morals (main subject)

(E_6) **[Wittgenstein (*cf.* Chap. 9)]:** Wittgenstein thought that "allegory" and "too early scientific theme" were out of date. In early twentieth century, few people are interested in a study of recognition without experiment. And thus, Wittgenstein proposed the linguistic turn:

transcendent epistemology (Kant) $\xrightarrow{\text{linguistic turn}}$ language game linguistic philosophy (Wittgenstein) (*cf.* Explanation 9.1 in Chap. 9)

The following Wittgenstein sayings ($\sharp_1$) - ($\sharp_3$) will remain forever.

($\sharp_1$) "The limits of my language mean the limits of my world."
($\sharp_2$) "What we cannot speak about we must pass over in silence"
($\sharp_3$) "Language-game"

That is because it is also the spirit of quantum language.

(E_7) **[Quantum language (*cf.* Chap.1, [32]]:** Linguistic philosophy emphasized the importance of the language, but

linguistic philosophy did not propose a language itself.

Thus, the meaning of "my language" is not clear in Wittgenstein philosophy. Hence, we propose quantum language, by which usual science can be described. We assume that quantum language is the only one (scientific) useful theory in 2500 years history of dualistic idealism. (*cf.* Conjecture 11.2). Quantum language is not related to the main part (i.e., ethics) of Platonic method of telling philosophy.

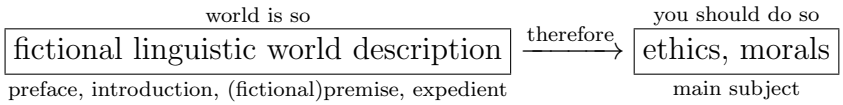
10.2.3 Why did Western philosophy continue to prosper over 2500 years?

Now we can answer the question:

(F) Why did Western philosophy continue to prosper over 2500 years?
(in spite that it is useless). Or why did Western philosophy prosper only in the West?

The answer is as follows.

(G) Western philosophy follows Platonic method of telling philosophy, i.e.,



Also, it should be noted that Platonic method of telling philosophy might be a desperate strategy for western philosophy to coexist with Christianity, though Plato did not intend it (since Plato was before Jesus).

However, this has the following merits:

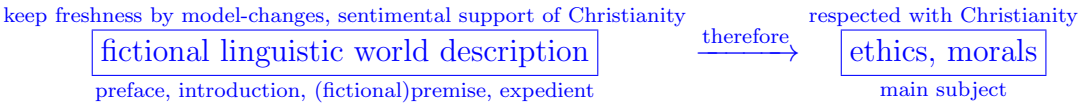
(H) The western philosophy was able to keep freshness for a long time by renewing a preface part (i.e., the fictional linguistic world description). THat is , this played a similar role of the model change of a car. Also, the philosophy of world description is interesting as a literature. As seen in Sec. 7.6.2 [Berkeley], Christianity wanted the prosperity of modern philosophy (from Descartes to Kant), which has significance as a buffer zone of Christianity with Newtonian mechanics.

(I) The main part (i.e., ethics) overlapped with Christianity, which was too strong. This implies that

(i) the main part (i.e., ethics) is almost unchanged.

(ii) western philosophy has a ground such that it is respected, that is, the base to be respected has been prepared.

Summing up, we see that



This is the reason that western philosophy has been prospering for 2500 years.

10.3 Did Western philosophy make a progress?

10.3.1 Miracle: Western philosophy converges to quantum language

Assertion 10.4. (= Assertion 1.5) **[The correspondence of key-words]** **[The key words in the linguistic world description]** The linguistic world description is the mind-matter dualism, which is composed of three key-words, that is, [A](= mind), [C](= matter) and [B](= body: something connecting [A:mind] and [C:matter]). Thus, we see that:

mind-matter dualism	[A](= mind)	[B](between A and B)	[C](= matter)
Plato	actual world	Idea	/ [/]
Thomas Aquinas	universale post rem	universale ante rem	/ [universale in re]
Descartes	I, mind, brain	body	/ [matter]
Locke	mind	secondary quality	primary quality [/]
Berkeley	mind	secondary quality	/ [God]
Kant	actual world	perception	/ [thing-in-itself]
statistics	sample space	/	parameter [population]
quantum language	**measured value**	**measuring instrument**	**state** **[system]**

If Western philosophy (i.e., dualistic idealism) makes progress, its key-words are naturally refined and clarified. Also, since the complete version is realized as quantum language, each dualistic idealism can be completely understood in comparison with quantum language. For example, "Plato's idea" is ambiguous, however, "secondary quality" is rather clear, and further, "observable(=measuring instrument)" can be completely understood. That is, the term "observable" can be used as mention in Axiom 1 in Section 1.1. Thus, we see

$$\textcircled{1}\text{:Idea} \xrightarrow[\text{clarification}]{} \textcircled{2}\text{: secondary quality} \xrightarrow[\text{clarification}]{} \textcircled{3}\text{: observable (= measuring instrument)}$$

Therefore,

(A) **Western philosophy keeps making progress certainly since Plato, if "to make progress" is defined by "to come near quantum language".**

That is, we obtain the following conclusion:

$$\boxed{\text{Plato}} \xrightarrow[\text{progress}]{} \cdots \xrightarrow[\text{progress}]{} \boxed{\text{Descates, Kant}} \xrightarrow[\text{progress}]{} \cdots \xrightarrow[\text{progress}]{} \boxed{\text{Quantum language}}$$

However,

quantum language is not related to ethics.

Therefore, we consider that

(B) the expiration date of Platonic method of telling philosophy has expired, if quantum language is the final goal.

10.3.2 The purpose of the fictional linguistic world description

Let us rewrite Assertion 10.2 (= Assertion 1.3: the classification of philosophers) as follows.

$$(\flat)\ \begin{cases} (\flat_1)\text{: the realistic world description (physics)} \\ \quad \text{Aristotle, Archimedes, Galileo, Newton, Einstein, } \cdots \\ (\flat_2)\text{: the fictional linguistic world description (Western philosophy)} \\ \quad \text{Plato, Scholasticism, Descartes, Locke, Leibniz, Berkeley, Hume, Kant, Husserl} \\ (\flat_3)\text{: the scientific linguistic world description (statistics, quantum language)} \\ \quad \text{Parmenides, Zeno, J. Bernoulli, statistics (e.g., Fischer), quantum language} \end{cases}$$

Each purpose is as follows in common-sense terms.

(C_1) The purpose of the realistic world description($\flat_1$) is to investigate the truth of the space (i.e., the universe)

(C_2) The purpose of the fictional linguistic world description($\flat_2$) is not clear. If I was to say it, the purpose is to promote the understanding of the main subject (i.e., ethics). Speaking at the half-jokingly, the purpose is to pretend to be intellectuals.

(C_3) The purpose of the scientific linguistic world description($\flat_3$) is to propose the language by which most sciences can be described

Since the purpose of the fictional linguistic world description($\flat_2$) is not clear, this study progressed only slowly for 2,500 years. Thus, I propose that the above (G_2) is replaced by the following (*cf.* Sec.3.3.1: The necessity of idealism and dualism).

Purpose 10.5. The purpose of the fictional linguistic world description (=fictional dualistic idealism) is defined by

($\sharp_1$) **To investigate the essence of dualistic idealism**

or equivalently,

($\sharp_2$) **To find the useful dualistic idealism (i.e., quantum language)**
(if the following conjecture (Conjecture 10.6) is accepted).

(Notice) We believe that ($\sharp_1$) and ($\sharp_2$) are equivalent, since we think that any useless theory is not essential. In fact, we think that Plato, Descartes, Locke, Leibniz, Berkeley, Hume, Kant, Husserl and so on made efforts to clarify the essence of dualistic idealism (= dualistic metaphysics)

This purpose can be achieved by quantum language, if the following Conjecture 10.6 can be solved.

Conjecture 10.6. We expect the next.

- quantum language is the only one useful dualistic idealism.

(Notice) If "dualistic idealism" is replaced by "monistic realism", there are many useful theories such as Newtonian mechanics, electromagnetism, the theory of relativity, etc.

Assume that this conjecture is true. Then, As the rationalization that the miracle (F) (i.e., the world description approaches quantum language) realized, I can speak the following.

(D) In the framework of "dualistic idealism" (*cf.* Sec.3.3.1: The necessity of idealism and dualism), philosophers wandered for 2,500 years without having an aim (*cf.* (C_2)). Since philosophers have persisted in "logical" (*cf.* Sec.3.4.3: The meaning of "logic"), it is natural to consider that impractical mysterious theories became extinct. After all, philosophers wandered and came near quantum language.

Hence I want to consider that (C_2)=(C_3), that is,

(E) The purpose of the fictional linguistic world description($\flat_2$)
= The purpose of the scientific linguistic world description($\flat_3$)

Then, we see:

Conclusion 10.7. We think, in the sense of the above (D), that the fictional linguistic world description has the purpose as mentioned in Purpose 10.5. Thus, I conclude that

- **the fictional linguistic world description has made a progress.**

In other words,

- **the fictional linguistic world description has made a progress, if "to make progress" is defined by "to come near quantum language".**

10.3.3 Philosophy is the king of the academic ?

I think that there is no person who believe that "Philosophy is the king of the academic" or "Philosophy is study to investigate truth". However, if a few person think so, this is due to the fact:

(F_1) The difference among "physics: ($\flat_1$)", "literature: ($\flat_2$)" and "scientific language: ($\flat_3$)" in Assertion 10.2 is not completely well known.

However, note that my assertion (in Assertion 1.2) is as follows:

(F_2) "Literature: ($\flat_2$)" and "Scientific language: ($\flat_3$)" $\longrightarrow$ converge to Scientific language "Quantum language"

If so, I think that "Philosophy is the king of the academic" is not a complete misunderstanding.

♠**Note 10.1.** I have not a complete understanding of "self-reference". Thus, there is a possibility that the above conclusion about "fictional(=self-referential) vs. scientific" is not true. As mentioned in Conjecture 7.6(or, Note 9.1), it is necessary to understand the meaning of "self-reference" completely.

Chapter 11

Postscript

Again, our conclusion will be written again.

11.1 Quantum language

As one of answers of the Bohr=Einstein debates, I proposed quantum language (*cf.* ref.[32]). Briefly speaking, this is summarized as the following assertion

Assertion 11.1. (= Assertion 1.2) [The location of quantum language in the history of world-description (*cf.* ref.[14, 32])]

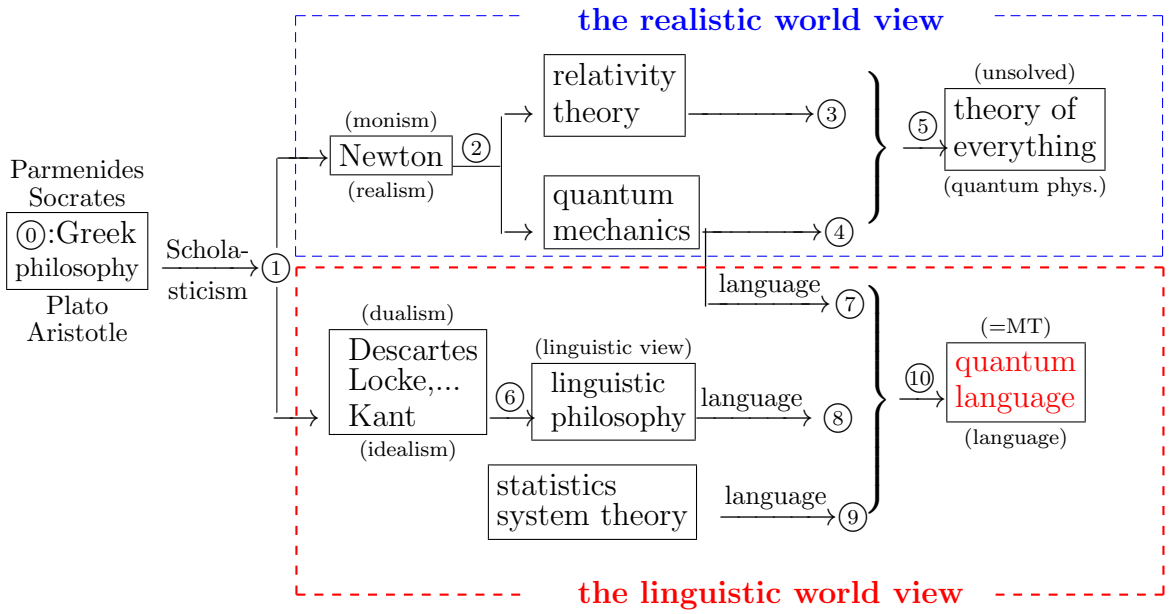


Figure 0.1: The history of the world-description

11.2 Main problems in this paper

Most scientists may think that the world description part of western philosophy [⓪(Plato) - ① - ⑥ - ⑧] in the above figure is merely a wordplay concerning the term "self-reference".

In this paper, in order to contradict their opinion, we devoted ourselves to the following problems, which are the two biggest unsolved problems in the western philosophy:

(A_1) Almost people certainly believe that science makes progress. However, there may be a lot of opinions about philosophy. That is, we have the question:

- **Did western philosophy [⓪ - ① - ⑥ - ⑧] make progress? Or what is the measure of "progress"?**

(A_2) Also, we have the following question:

- **Why has western philosophy [⓪ - ① - ⑥ - ⑧] been prospering? (in spite that it is not scientifically useful). Or why did Western philosophy prosper only in the West?**

In this paper, reviewing the history of western philosophy from the quantum theoretical point of view, I give the answer to this problems (A_1) and (A_2) as follows.

11.3 The answer to the problem (A_1): progress? (*cf.* Sec. 10.3)

Although the existence of "true dualistic idealism" (= "successful dualistic metaphysics in the scientific sense") is not generally assured, I think that quantum language is the only one successful dualistic idealism in the scientific sense. Thus we consider that

(B) In the framework of "dualistic idealism" (*cf.* Sec.3.3.1: The necessity of idealism and dualism), philosophers wandered for 2,500 years without having an aim (*cf.* (C_2) in Sec.10.3.2). Since philosophers have been preferring "logical" (*cf.* Sec.3.4.3: The meaning of "logic"), it is natural to consider that impractical mysterious theories became extinct. After all, philosophers wandered and came near quantum language.

By such circumstances, the following phenomenon seemed to be caused.

(C) western philosophy [⓪ - ① - ⑥ - ⑧] converges to quantum language.
or
the aim of philosophers is to investigate true (i.e., useful) dualistic idealism

In other words, we conclude (*cf.* Sec. 10.3) that

(D) **western philosophy has been making progress for 2500 years, if the measure of "to make progress" is defined by "to come near quantum language".**

11.4 The answer to the problem (A_2): prospering? (*cf.* Sec. 10.2.3)

Western philosophy [⓪ - ① - ⑥ - ⑧] has obeyed Platonic method of telling philosophy, that is,

(E):Fictional linguistic world description(western philosophy) in Sec.1.3.4

Platonic method of telling philosophy (in the main current of western philosophy) is as follows.

(E) $\underset{\text{preface, introduction, (fictional)premise, expedient}}{\overset{\text{world is so}}{\boxed{\text{fictional linguistic world description}}}} \xrightarrow{\text{therefore}} \underset{\text{main subject}}{\overset{\text{you should do so}}{\boxed{\text{ethics, morals}}}}$

Therefore,

(E_1) [world is so] is secondary,

(E_2) [you should do so] is main theme

Here, the fictional linguistic world description is, for example, the theory of Ideas (Plato), Discourse on the Method (Descartes), Critique of Pure Reason (Kant), etc.

The role of the fictional linguistic world description is various, e.g.,

(F_1) The "logic" is emphasized to show a difference with the religion (i.e., Christianity), However, it should be noted that the fictional linguistic world description is not related to truth. Simply speaking, it is a kind of genre of literature concerning "dualistic metaphysics". Thus, quantitative arguments are not desirable. Also, it is not related to truth.

(F_2) The main part (i.e., ethics) overlapped with Christianity, and thus, western philosophy has a ground such that it is respected. Also, it should be noted that the main part (i.e., ethics) is almost unchanged. On the other hand, the sub-part (i.e., the fictional linguistic world description) is easy to be rich in change. Hence, the western philosophy was able to keep freshness for a long time by renewing a preface part (i.e., world description). This is similar to the model change of a car (or, a new wrapping paper). That is, western philosophy [⓪ - ① - ⑥ - ⑧] is the history of (superficial) renewals (i.e., model-change).

(F_3) It should be noted that Platonic method of telling philosophy might be a desperate strategy for western philosophy to coexist with Christianity, though Plato did not intend it (since Plato was before Jesus). Also, as seen in Sec. 7.6.2 [Berkeley], Christianity wanted the prosperity of modern philosophy (from Descartes to Kant), which has significance as a buffer zone of Christianity with Newtonian mechanics.

(F_4) Summing up, we see (*cf.* Sec. 10.2.3) that

$\underset{\text{preface, introduction, (fictional)premise, expedient}}{\overset{\text{keep freshness by model-changes, sentimental support of Christianity}}{\boxed{\text{fictional linguistic world description}}}} \xrightarrow{\text{therefore}} \underset{\text{main subject}}{\overset{\text{respected with Christianity}}{\boxed{\text{ethics, morals}}}}$

That is, there is no Western philosophy without Christianity.

Thus, western philosophy is socially and literarily useful, though it is not scientifically useful. This is the reason that western philosophy (which may be called "Galapagos philosophy" *cf.* Note 3.7) has been prospering for 2500 years.

11.5 Unsolved problems

Lastly I add the following unsolved problems.

Conjecture 11.2.

($\sharp_1$) A scientific proposition and a self-referential proposition are disjoint (=Conjecture 7.6, Note 10.1)
(In other words, clarify the meaning of "self-reference"!)

($\sharp_2$) quantum language is the only one useful dualistic idealism in the scientific sense. (=Conjecture 10.6)

[Notice] If ($\sharp_2$) is proved, as mentioned in Sec.10.3.2, we say that the following two are equivalent:

- the philosophy of world description has made progress, if the measure of "to make progress" is defined by "to come near quantum language".
- the purpose of the philosophy of world description is to investigate the essence of dualistic idealism.

I hope the readers to try to solve the above after reading ref. [32].

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For the further information on my research, see the following home page:
(`http://www.math.keio.ac.jp/~ishikawa/indexe.html`)

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Department of Mathematics
Faculty of Science and Technology
Keio University

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