

NEO IN WONDERLAND

~ A Tale of Money That Changed Our Future ~

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Date	Version	Change
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2009-12-05	0.1.1	Typographical improvements.
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How to Send Patches

The author would really appreciate if you could send patches when you find mistakes or part that can be improved.

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 - Your name will be listed in *Afterword for the English Version* (p.138) when your changes are applied.

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To Panse Saito

Welcome to the Earth. This book is a gift for the future that your
generation will realize.

Overview

Today, humanity seems to be suffering from a trilogy of problems: we are living in the era of Peak Oil in which the world production of petroleum is about to hit its peak if not it has already done so (energy crisis), which is probably the fundamental reason why we are experiencing the severest economic depression in the history of capitalism (economic crisis), while the whole human activities with effects to change the earthly environment are alleged to be the cause of climate changes (environmental crisis).

Some argue that moving toward so-called green economy, or changing to natural energy sources instead of relying on fossil fuels, is the solution to all these. Will it work, or will it just introduce another level of the same trilogy of problems as long as our economy requires to keep growing?

Let's begin an adventure with Accianco, a kindergarten girl, Kencha, a super robot, and Puppy-chan, a puppy, to explore an alternative solution in this sci-fi monetary fantasy novel. The story begins one year after the past adventure of the trio, in which they visited the *Wonderland* where the Internet is utilized in an extreme fashion.

Dr. Suttokoholm, a blind genius scientist in the Wonderland, is kidnapped by the *Army of Centricity* that aims to invade the country! Accianco, Kencha, Puppy-chan and Accianco's mother go to the Wonderland through the wormhole invented by Dr. Suttokoholm.

A new adventure begins around the centerless monetary mechanism in the centerless Wonderland that takes place in *Hunan City*, a big city in the Wonderland.

What is the *Army of Centricity* after? Will Accianco and her friends be able to save Dr. Suttokoholm?

The story evolves in an unexpected way as they encounter mysterious NEO in the Wonderland.

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Map of the Wonderland (Hunan District)

Prologue: The Adventure One Year Ago

~ from *Explorers! of the Wonderful Internet*¹ ~

Accianco, a little precocious kindergarten girl, *Kencha*, a super robot, and *Puppy-chan*, a puppy, were a friendly trio living peacefully with Accianco's mother in a small house in front of a park.

Beginning of the Exploring Party

But in one afternoon, the trio accidentally fell into a black deep hole that suddenly appeared in the park, and came out with a popping sound where none of them knew before.

The shock of having gone through the hole broke Kencha's GPS equipment. Therefore they had no idea where they were.

With a prompt action, Kencha communicated with Accianco's mother using a video phone through the Internet, which was a wonder to the little girl. The inspiration made her declare the formation of the *Exploring Party of the Wonders of the Internet*, and thus, while Kencha was too busy figuring out how to get back, an adventure began that urged her and even Puppy-chan to explore the wonders of the Internet.

The Internet-like Wonderland

The trio soon discovered that it was the *Wonderland* they accidentally visited, which was a rising nation founded about ten years ago. The nation was well known for utilizing the Internet to its extreme; the mechanism of the nation

¹ "Explorers! of the Wonderful Internet" is a book by Prof. Jun Murai, or the founding father of the Internet in Japan. It is a book for children to explore the wonders of the Internet and its distributed nature. The author of this novel took charge of the story of "Explorers! of the Wonderful Internet", and this novel was originally written as its sequel.

itself had been designed to resemble the Internet. It was a strange nation to the trio where there was no capital, no king, no president, no politicians or not even bureaucrats. Everything there was decided by testing out how it would work upon reaching to a rough consensus after discussion among the people.

Accianco's mother told them that her brother, i.e., Accianco's uncle, was living in the Wonderland. Thus the trio decided to move by train from the station near the wind-power facility operated by Hyururun Electric Power Co. where they first came out from the hole, to the TekeTeke exit of the Pompoco station where the uncle should be waiting. They worried about the train fee, but they soon discovered that no fee was required for children, robots and puppies in the Wonderland.

Accianco and her friends learned that the mechanism of the Internet for transferring information to the correspondent by hopping over networks resembles how to reach the destination by changing trains in the real world.

The Centers do not Strive in the Wonderland

The uncle was there at the Pompoco station with his car, which was an electric vehicle connected to the Internet. Not only his, but all automobiles in the nation were so-called Internet vehicles that ran on electricity. The Wonderland obviously had realized a new society that did not depend on fossil fuels such as petroleum.

In the uncle's vehicle, the trio experienced some more wonders. First was a roundabout², or a traffic circle. It is a rotary intersection without traffic signals, commonly found in Europe (the one surrounding the Arch of Triumph in Paris is a famous example). After a car enters such an intersection, it would turn round and round avoiding the obstacle in the middle, and leave in any direction the driver wants. According to the uncle, people of the Wonderland preferred evading danger by being careful themselves to entrusting their lives to some devices such as traffic signals.

On the Internet, too, the networks themselves do not guarantee anything, while end points work hard to maintain correctness of communication. The Internet and the Wonderland were also common in that respect; they both had mechanisms in which centers did not work hard.

In the Wonderland, many things were actually realized by power of everyone instead of relying on some centric forces. For example, instead of using a system like AMeDAS found in Japan that is a collection of fixed weather sensors operated by the government, people in the Wonderland could

²Roundabout (p.139)

draw shapes of rain clouds just by gathering information of the strength of windshield-wiper movements of running vehicles. Or, instead of using a supercomputer, they could realize weather forecasts by using idle computing time of many small computers including those of on-board computers of vehicles.

As another example of centers not working hard, there was not a set school in the Wonderland. The children could learn various things through the Internet from adults of a variety of professions; those adults could provide the children with knowledge based on their experiences.

Dr. Suttokoholm and His Miracle Technology

However, Accianco and her friends had to face a big challenge in their adventure there. When the vehicle was parked while Accianco went to the bathroom, a girl looking very much like her appeared, and replaced her.

Being unaware of the impostor, the uncle's vehicle continued its travel with Kencha, Puppy-chan and the girl pretending to be Accianco.

Accianco was left alone, but was saved by a blind, wheel-chaired genius scientist *Dr. Suttokoholm*. Because in the Wonderland, everything was attached an RFID (Radio Frequency IDentification)³ tag, even Dr. Suttokoholm who cannot see could comprehend his surrounding situations well.

Then Dr. Suttokoholm told Accianco how the Wonderland was founded. The Wonderland was a nation founded by old people such as Dr. Suttokoholm himself gathering from across the world to create a new society.

Accianco was taken to Dr. Suttokoholm's home by his auto-navigated vehicle, where he skillfully fixed her a cup of cocoa using a half-automated magical kitchen. She wondered that perhaps full-automation was more convenient. But Dr. Suttokoholm told her that he wanted to be the master of the kitchen and to challenge cooking.

Accianco-Bot and Security

Then everyone including Accianco's impostor came to Dr. Suttokoholm's house. The trio discovered that Dr. Suttokoholm was a grandfather of the uncle, which meant that he was a great grandfather of Accianco. The impostor turned out to be a robot named *Accianco-Bot*, an almighty mimicry machine invented by Dr. Suttokoholm.

Through this incident of mimicry by Accianco-Bot, the trio learned about the mechanism of cryptography⁴ being used throughout the Internet.

³**RFID Tag** (p.140)

⁴**Cryptography** (p.140)

The trio was then worried that even if an identity theft could be prevented by using cryptography, the same technology could be used by bad people to discuss bad things secretly. The uncle pointed out that using cryptography, good people could also discuss how to catch the bad people without being known; he told the trio that whether the technology is good or bad would depend on the people who use it.

The uncle also suggested that a government, too, could try some bad things against people, and that it would be important for the people to prepare instruments for protecting themselves from such deeds. Therefore, the uncle said, it would be better to disable governments to control important technologies such as cryptography. The Wonderland, of course, got rid of the government to begin with.

The End of the Beginning

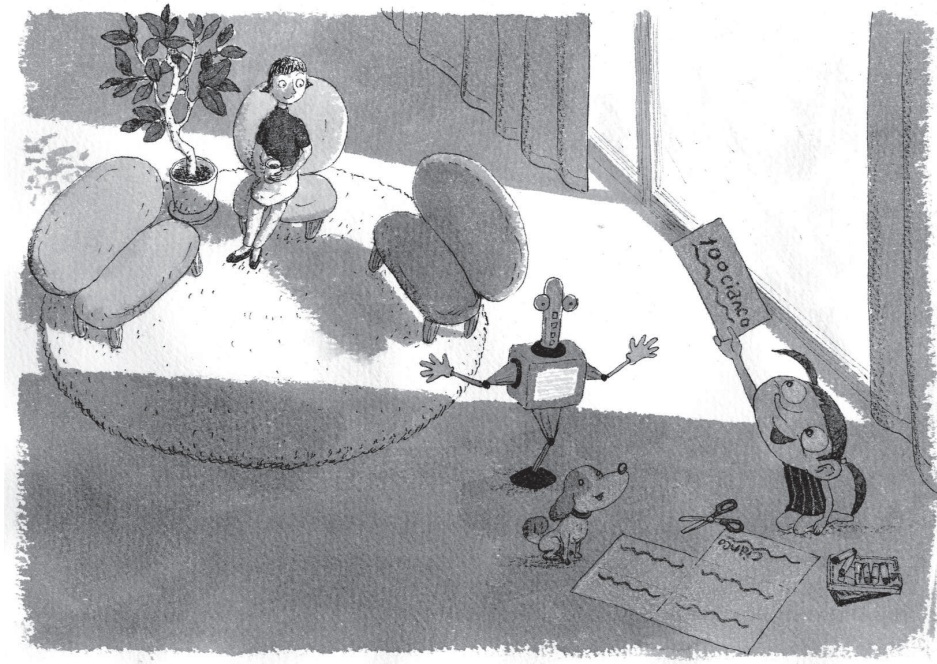
That night, the trio ate spaghetti for the dinner that the uncle made. Next morning, they went to the airport to leave the Wonderland by an airplane. Many people came and went at the airport to see the Wonderland for pleasure or for businesses, just like the Internet was a common platform for a variety of people across the globe.

Just before their departure, Dr. Suttokoholm gave Accianco a picture book. It was a mysterious book entitled “Explorers! of the Wonderful Internet”, in which the adventure of the trio in the Wonderland up to that very moment was described.

Accianco and her friends flew back, and found Accianco’s mother at the airport to see them. In the mother’s car, the trio reported to her how their adventure went, which continued for a long time until they finally returned to their home.

Chapter 1

An Incident in the Morning



Accianco's mother tells Accianco that money was stolen from the unattended shop where she always buys vegetables. That leads to Accianco's play with play money.

1.1 Why Do Some People Steal Money?

It was a fresh morning. It was such a good weather that more than 2,000 watts were generated by the solar power generator on the roof of a small house with pink walls that stood in front of a park.

In the house, by the window of the living room on the second floor, was a little girl who looked as if she would enter an elementary school anytime soon. This morning, she was wearing her favourite one-piece dress with blue vertical stripes. Her hair was bound at two points at the sides as usual, and her big round eyes were always looking for excitements.

She was playing with a white pyramid-shaped box. She laid the box on the floor so that its bottom faced diagonally upward. She adjusted the angle of the box so that the black panel that filled its bottom could best receive the sunlight through the window. The box was perhaps a small solar charger that could charge dry cell batteries or mobile phones. Before long, an orange lamp started blinking on the side of the box.

“Accianco did it! It’s orange again today.”

The girl who called herself *Accianco* reported loudly to her mother who was preparing the breakfast in the kitchen.

“It means up to three dry batteries can be charged.”

Then Accianco went to the display panel on the wall near the kitchen that showed how much power was being generated on the roof. She stretched herself to read the numbers on the panel. One could easily tell that she must be in charge of power generation in this house.

Of course, there was another “thing” in Accianco’s house that could generate power; it was *Kench*a, a single-legged super robot with a display in his stomach that he used for telling stories to Accianco or answering her questions. But he used the power only by himself, and in fact, the principle of his power generation was not known by the rest of the family members. Accianco’s mother had not even told Accianco where she obtained him.

There was another member in the family, although he did not generate power; it was *Puppy-chan*, a good-natured, little Cocker Spaniel puppy who liked people.

Actually, this trio: Accianco, *Kench*a and *Puppy-chan*, was the reason why the solar power generator on the roof came to Accianco’s house about a year ago.

A short while before that, with *Kench*a and *Puppy-chan*, Accianco accidentally fell into a black deep hole that suddenly appeared in the park in front of her house. Then they came out with a popping sound in a country named the *Wonderland* on the other side of the Earth. The *Wonderland*, contrary to what the name would suggest, was not a country in a fairy tale, but an actual nation. It was a newly founded nation, founded about ten years ago, which attracted the world’s attention by its extreme utilization of the Internet. Accianco and her friends could explore the wonders of the Internet in the *Wonderland*, with help from two of her relatives who happened to live there: Accianco’s uncle who was the younger brother of her mother,

and Dr. Suttokoholm who was a grandfather of her mother and uncle.

But the Internet was not the only thing for which the Wonderland was known extremely utilizing. The first place Accianco and her friends appeared in the Wonderland through the black deep hole was a wind power generation facility operated by Hyururun Electric Power Co. of the Wonderland. Utilization of natural energy was also active in the country.

Accianco's mother became interested in power generation using natural energy sources after knowing situations in the Wonderland through the adventure story of Accianco and her friends. That was why Accianco's house got equipped with the solar power generator on the roof, and they started to use small solar battery charger recently.

Accianco's mother finished preparation of the breakfast, and she talked to Accianco, still wearing an apron.

"A-chan. Listen"

Yes, Accianco's real name was *A-chan*. But she was so small that she called herself *Accianco*.

Every morning, the mother explained things happened before Accianco woke up. The other day, she talked about how the park turned all white with frost. That had disappeared by the time Accianco woke up, but sounded very interesting as she imagined how it would have been.

Accianco liked her mother's enjoyable stories very much. But today, something was different. Kencha and Puppy-chan also came, and the trio sat around the mother in the living room.

"You all know that I often buy vegetables in the morning."

"Yes, I know."

The mother always bought vegetables from an unattended shop. The farmer of a nearby farm, making a variety of vegetables in organic ways, were using a small space in front of a real estate office for selling vegetables.

Accianco's mother liked to use the shop because she could buy a vegetable inexpensively with one coin, and especially because the vegetables were so fresh. All radishes and carrots were sold with their leaves, of course, so that she could efficiently use them for soups for example.

"This morning, when I went to the shop, there was someone watching. It was unusual for an unattended shop, you know. She told me that money had been stolen from the shop."

Shoppers usually put money in a box because the shop was unattended by anyone. But the owner of the shop discovered that the box was gone when she came to the shop yesterday.

Accianco knew that stealing was bad. Puppy-chan also knew what he had to do with a thief, so he barked.

1.2 Wonders of Money

“Why do some people steal money?”

That was a question posed by Accianco. She had seen the unattended vegetable shop. There were shelves on which many vegetables were laid. There was money in the box, but there were also vegetables. If the thief stole vegetables instead of money, that someone could eat them without waiting. She knew that stealing was bad. But why did the thief steal money?

“Well, the thief stole money because with money, the thief can buy many different things that that someone wants, not only vegetables.” Then the mother realized something. “Plus, money can be used by anyone. So that someone who stole money, too, can buy things with that money.”

Accianco’s mother worked as a consultant to help people improve their work using the Internet. Accianco knew that her mother often solved difficult problems with the customers, so that she knew that her mother was good at coming up with solutions when a problem happened.

“So. I think that money should have a name written on it to show to whom it is addressed.”

“Address? On money?”

For Accianco, money was a coin. She sort of knew that there also was paper money, but had never got one in her life. An address is written on a letter. Accianco thought that money and letters were different.

“It’s called a cheque. You write on a sheet of paper how much money it is and to whom it is addressed, and pass it to a person or a shop.”

The one who received the cheque would bring it to the bank, where he or she could change it with coins or paper money. Of course, he or she needs to show their identification to prove that they are the one to whom the cheque was addressed.

Accianco’s mother used to use personal cheques a lot when she studied in the United States of America. In the U.S., anyone could use personal cheques once they had a checking account in a bank. It is called the personal cheque. Accianco’s mother, though she was not a mother then, used to pay with personal cheques on many occasions including the rent for her apartment, electricity, and shopping at supermarkets.

“If a thief stole a cheque, that someone could not have it changed to coins or paper money because he or she is not the correct person as indicated on the cheque. So there is little worry that it would be stolen, and people can send those cheques in envelopes by normal postal mail.”

“Ngamo!”

Accianco made a sound that sounded as if she was calling a some type of duck in Japanese language. Accianco often made this strange sound when

she got surprised or felt mysterious. Today, perhaps she was a little surprised because it was her first time to hear that there existed such a kind of money in the world.

Soon, she got joyful as if something interesting had popped in her mind.

“Accianco’s going to make my own cheque!”

Accianco felt like playing with cheques as she came to know that her mother was using them often. So the play time began as usual.

Her mother cut a sheet of drawing paper so that Accianco could hold something a little bigger than an actual cheque. With some crayons, Accianco filled items needed for the sheet of paper to be like a cheque, taking advices from her mother.

When it came to writing the amount of money, Accianco had to stop for a while. It was not possible or appropriate for Accianco to pay with actual money. Therefore, she decided to write down a fake sort of money. Play money, so to speak.

Accianco wrote “100 cianco” as the amount of money her play cheque represented.

“It’s money called *cianco*”

In her fantasy world, *cianco* was the unit of money used in the nation of persimmons, she explained.

For the play cheque to be completed, it was now only waiting for the name to whom it was addressed and Accianco’s signature.

1.3 Black Hole Again

It was then that they heard children making sounds from the direction of the park.

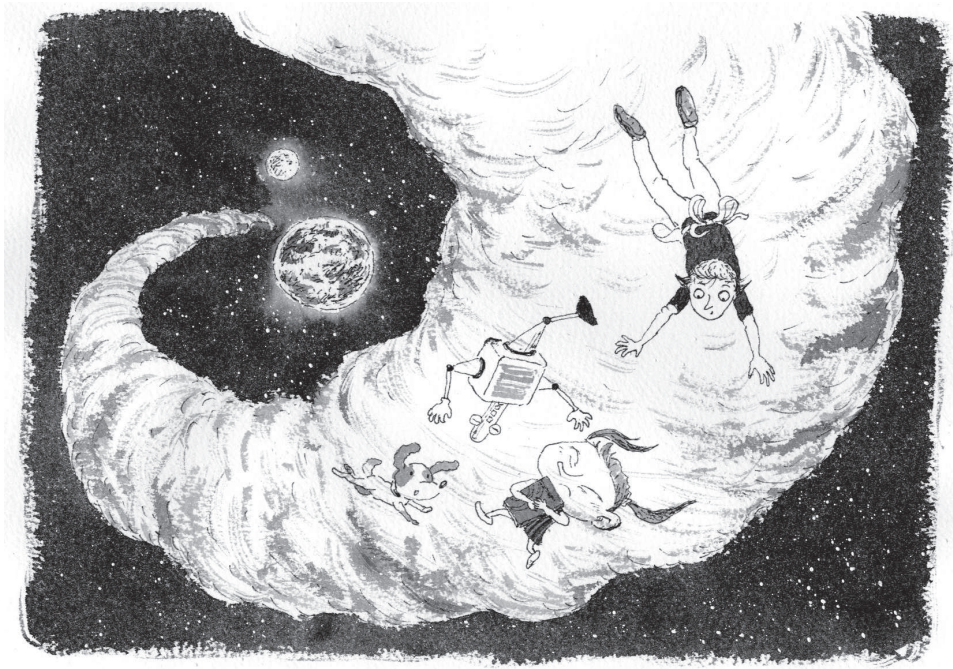
Accianco’s mother found that children on their way to the elementary school nearby were gathering and making sounds at the park in front of Accianco’s house. They looked as if they were surrounding something black on the ground.

It was a black hole. A black deep hole was suddenly there just in front of the slider. It looked just like the one through which the trio, Accianco, Kencha and Puppy-chan, went to the Wonderland one year ago.

Children were trying to have a good look of deeper down the hole while being careful not to fall into it.

Chapter 2

A Rainbow Tunnel



The trio: Accianco, Kencha and Puppy-chan, jumps into the black hole to re-enter the Wonderland. Only this time, Accianco's mother is with them.

2.1 Voyage Begins

Fuss at the Park

Accianco's mother went out at the veranda to see the situation at the park more closely. Accianco, Kencha and Puppy-chan followed.

Accianco and Puppy-chan could see what was happening through the holes on the wall of the veranda. Kencha was closely observing the black hole and the children surrounding it by zooming into the scene with his magic eyes. Perhaps children knew it was dangerous; none of them tried to get into the hole.

When Kencha zoomed out his magic eyes, he could see a police officer riding a bicycle coming towards the scene from the nearby police box. Someone may have called the police. Some adults came by to take the children away from the hole. The police officer was talking something on a wireless communication device.

A while later, the siren of a patrol car was heard. Many police officers and civil clerks came, and they all started to discuss among one another surrounding the hole. Then, suddenly the discussion was over, and the police officers placed yellow tapes around the hole so that no one could approach there. All these happened in a short period of time.

The mother thought that she needed to caution Accianco so that her daughter would not go near the hole either.

“A-chan.”

However, when she looked back, there was no Accianco, or Kencha, or Puppy-chan.

Preparing for the Voyage

“A-chan!”

Being anxious, Accianco’s mother went to the children’s room, where she saw Accianco packing her things, including some sweets, into her rucksack. Kencha and Puppy-chan were watching her, a little worried.

“A-chan, you are going, aren’t you?”

The mother knew that the black hole was the gateway to the Wonderland. She also knew that Accianco would not listen to her mother once she was determined.

One year ago, it was an accident that she fell into the hole. Also, Kencha and Puppy-chan were with her. So she figured that it would be a good experience for Accianco to see many things and to take an adventure. After all, it was her first experience of a foreign country. But this time, she could also choose not to go.

“Yes, Accianco is going again.”

Then Accianco ran towards the living room. Everyone followed her.

“A-chan, your mom is a little worried.”

“It’s all right.”

Accianco grabbed the half-completed play cheque on the carpet, and put it into her rucksack. Perhaps she intended to continue her play in the Wonderland.

Then she put the rucksack on her shoulders, and went to a bookshelf to take a book out. It was her copy of *Explorers! of the Wonderful Internet*, given to her in the Wonderland by her great grandfather and a great scientist, Dr. Suttokoholm. Accianco remembered the last words Dr. Suttokoholm told her when she left the Wonderland: “*Next time you come to the Wonderland, make sure you bring this book with you.*”

Accianco, holding the book, went outside from the door. Kencha and Puppy-chan followed her.

“A-chan! Wait!”

Following the trio, Accianco’s mother also ran towards the park.

Re-entry to the Wonderland!

There were a lot of police officers in the park, watching so that children would not come near the hole. Many officers were in fact surrounding the black hole, so that it was hard to get there.

But Accianco had realized that those police officers were all trying to be careful about around the hole, and no one was there behind the slider.

Accianco and her friends sneaked to the back of the slider. Then, Accianco quickly ran up the stairs making tapping sounds, and made it to the top of the slider.

“Hey, what are you doing, it’s dangerous!”

A police officer shouted, realizing that Accianco was on the top of the slider.

But it did not stop Accianco. She slid down the slider, and jumped into the hole. Kencha and Puppy-chan were following immediately after her. A fraction of a second earlier than the hands of police officers could catch Accianco’s mother, she also jumped into the hole still wearing an apron.

The all four disappeared into the hole, leaving only the police officers.

“Hey!”

The police officers called towards deep down the hole. But their voice did not reach Accianco, her friends, and mother.

2.2 Between Time and Space

A Long Tunnel

One year ago, when Accianco accidentally fell into the hole, or when Kencha followed her, or when Puppy-chan jumped in after finally making his mind up, it only took a moment for them to reappear in the Wonderland with a popping sound – or according to Kencha’s measurement, 133 milliseconds to be precise, which coincided with the duration of time for light to go around the Earth.

But this time, it was different. It looked as if they were all slowly falling down through some big rainbow tunnel.

Inside the tunnel, a strong wind seemed to be blowing, as the hairs of Accianco and her mother were waving. Accianco firmly held her book so that it would not be blown away by the wind.

Down below where they were heading, in the far away darkness, a huge, red, round, hot, melting thing was rotating, reflecting light from somewhere.

“Kencha, what’s that?”

Accianco’s mother asked, because she thought that Kencha would know, having experienced jumping into the hole before.

“Well, one year ago, it took only a fraction of a second. . .,” Kencha had no idea what it was. “So I didn’t notice such a thing.”

Then suddenly, something that looked about a half the size of the big round thing crashed into the thing with an ultra speed. The shape of the whole objects collapsed for a moment, and an innumerable debris scattered out in the space surrounding the object. Then at the next moment, the scattered debris gathered to form a small round object, which rapidly rotated around the big round object that recovered its shape. The distance between the big and small round objects got longer and longer.

“Ah!” Kencha must have realized something. “Perhaps it was a giant impact¹. That big round object is a planet, and we have just witnessed the birth of its satellite, I think. Though it was a fast-forward playback. I wonder what planet it is. . .”

Kencha had an answer immediately after he started his analysis.

“It appears that they are the Earth and the Moon soon after their birth.”

¹**Giant Impact** (p.142)

Beginning of the Earth

According to Kencha's explanation, while they were slowly falling down the tunnel, they were viewing a fast-forwarded history of the Earth² after its creation, which amounted to even hundreds of millions of years. Something was wrong in the first place that such old days of the Earth were seen. Moreover, the time seemed to elapse normally around the falling people, but it was running very fast further down below where the Earth was seen. Which made them think that the flow of time must be distorted inside this tunnel. The time around the Earth sometimes ran faster and then slower, but steadily ran very much faster than the real time.

"The Earth was made billions of years ago out of many small heavenly bodies crashed and stuck with one another." Kencha explained so that Accianco would easily understand. "You become hot after a push and shove game, right? Likewise, the Earth was really hot when it was born."

"The Moon was made when a big one hit?"

"Yes, it's a strong hypothesis called *Giant Impact*, which turned out to be the truth." Kencha then indicated towards the Earth with his magic hand. "Look. The ocean is forming."

Further down below, the Earth was beginning to turn blue. They witnessed in a fast-forwarded vision that the hot and melting Earth when it was first created got gradually cooled, which turned the huge amount of steam in the atmosphere into water that fell onto the surface of the Earth as a heavy rain, forming the first ocean.

The Earth was rapidly changing its appearance.

"The Earth is changing using two energy sources: the sunlight and the ground heat." Kencha explained. "First, the ground heat from the center of the Earth. The heat creates a flow of materials inside the Earth that goes round and round, which brings the hot materials towards the surface of the Earth. Just like the hot water in the bath is hotter above and cooler below. The materials inside the Earth are actually harder than steel, but they move really slowly, taking a long, long time."

Accianco thought that it was getting difficult, but she continued to listen because Kencha always liked to explain things.

"When you do push and shove, ones at the center are pushed hard from all directions, but ones at the rim are not. Likewise, on the surface of the Earth – which is all ocean now, so it actually means the bottom of the sea – the pressure is weak. That makes the hard materials melt, which becomes magma, and bursts out into the ocean. Submarine volcanos! The magma gets cooler and harder, and gradually becomes the Earth's crust. The crust

²History of the Earth (p.142)

is actually softer than what's inside the Earth. Some volcanos rise above water, and gradually become lands."

As Kencha explained, a continent was forming on the Earth.

"The next one among two energy sources that change the Earth is the sunlight. The sunlight warms the ocean, and so the steam vapors. Just like steam coming off a hot water in a bathtub. The steam in the end will become rain that falls over mountains. Then the flows of water are gathered, forming rivers, and go back to the ocean dissolving various materials on the ground. There begins the circulation of things that comes out and goes back to the ocean. Circulation means moving in a circular way that repeats going back to the beginning. A variety of materials move on the circulation of water, including the carbon dioxide in the air bursted out from under the ground as part of the gas from eruptions of volcanos."

Meanwhile, the Sun kept becoming brighter and brighter.

The Birth of the Biosphere

"Carbon dioxide helps the air holding heat and not releasing to space, so it makes the Earth warmer. I am sure you know it, too, Accianco, as everyone talks about the global warming today."

"Carbon dioxide, I know."

"The sunlight is the one that directly warms the Earth. And the brightness of the Sun is changing. If the Sun is not so bright, the Earth is not so warmed, so the amount of steam evaporated from the ocean is smaller. Then the rain doesn't fall so much, and the effect of the rain that dissolves carbon dioxide in the water and brings down to the ground becomes smaller. But the volcano is dependent only on the ground heat as its energy source. So the amount of carbon dioxide bursted out in the air by eruptions of volcanos does not change. Therefore, the amount of carbon dioxide in the air increases. Which makes the greenhouse effect stronger, and the temperature of the Earth is maintained still."

Accianco was listening, but obviously without understanding.

"On the other hand, if the Sun becomes brighter, then the Earth becomes warmer, and more steam gets evaporated from the ocean. Then more rain falls, and more carbon dioxide is dissolved into the water, reducing the amount of CO₂ in the air. Which makes the greenhouse effect weaker, maintaining the temperature of the Earth unchanged."

"As a result, the temperature of the atmosphere becomes stable, and the Earth could keep the ocean from evaporating for a long time." Accianco's mother sensed what Kencha wanted to say, and concluded his speech for him.

“That’s right. It is thought that one of our neighbors, the Venus, had its ocean evaporated.”

At that time, life was born under the stable ocean. But in no way, the event could be observed from the viewpoints of Accianco and others.

The first lives utilized the ground heat as their energy source that they could receive from the seabed. Because that was incomparably smaller than the energy from the Sun³, no big change had appeared for a long time.

After a long, long time, lives with photosynthesis capability appeared, which made the Earth look very different.

“Look!”

Accianco’s mother pointed towards the earth, excited. The green color began to cover the surface of the Earth. Accianco, too, saw the event with an astonished look.

“Photosynthesis is a process to synthesize organic materials out of water and carbon dioxide using the energy from the sunlight.” Kencha was analyzing the effects of the birth of plants to the Earth. “Because of plants, the circulation of water and other materials on the Earth has been changed a little. Because the plants absorb carbon dioxide and fix it underground, the greenhouse effect must have been weakened.”

That meant the Earth has changed its environment for lives to live more easily.

The Birth of the Humanosphere

Before long, human appeared.

Of course, the human beings were too small to be seen by Accianco and others who were looking down the Earth from far away. The reason why they could notice that human appeared, although they could not even notice that dinosaurs were there, was that the surface of the Earth had changed.

“Look, the human is born!”

Excitedly, Kencha pointed with his magic-hand. The agriculture seemed to have begun, and the forests were turning to farming fields.

That changed the reflection ratio of the sunlight and how water flowed on the surface of the Earth, which in turn had affected the environment of the Earth. Kencha was closely examining it with his magic-eye. Civilization at that time was a kind in which human redirected and utilized the flow of materials that had existed since long before the birth of human, energized mainly by the sunlight.

³Energy Budget of the Earth (p.143)

However, a blink of time later from the viewpoints of Accianco and others, so-called industrial revolution began, and human started to obtain energy from burning fossil fuels such as coal, oil and natural gas, which were resources buried underground. By becoming able to generate flows of materials and energy by themselves, human civilization had now arrived at a new stage. The population must have explosively grown, and the lights became visible in the urban areas at night.

The effects of human activity on the surface of the Earth had then become too apparent to need Kencha's magic-eye.

"Instead of movements of continental plates and erosions by flows of rivers, human started to move materials at much more faster speed by using tracks, trains, cargo ships and tankers."

"Yes, definitely." The mother remembered the conversation she had with Accianco this morning. "Money must be involved with those quick movements of materials."

Separation of All

It was then, all of a sudden, the whole tunnel trembled, and the shock made the picture book that Accianco held slip away from her arms to be blown by the wind.

"Ngamo!"

"Bow!"

Promptly, Puppy-chan jumped at the picture book, and held it in his mouth. But then, Puppy-chan got slowly blown away by the wind.

"Oh, Puppy-chan!"

Accianco tried to follow Puppy-chan, but Kencha grabbed her cloth with his magic-hand to stop her. Kencha could probably fly and bring Puppy-chan safely back with his propelling engine. He figured that he needed to make Accianco calm.

"Puppy-chan!"

"Calm down, Accianco!"

"Puppy-chan!"

Puppy-chan was gradually moving away from the rest of them.

Puppy-chan wanted to say something, too, but if he did, the picture book would be blown away. So he controlled himself to be silent, and quietly gazed Accianco back.

"Puppy-chan!"

"Ah!"

Suddenly, some electric shock ran through Kencha's body, as if he was hit by a lightning. Kencha's power faded for a short moment, which was

enough for Accianco to slip out from his magic-hand and to be drifted away by the wind.

“A-chan!”

Accianco’s mother reached her hand out, but she could not touch Accianco because of Kencha’s body in between.

“Ah, Accianco!”

Kencha became himself again, and tried to pull himself together to start the propelling engine, but his power was not enough to start it. Nevertheless, Kencha tried to follow Accianco, but this time, the mother stopped him. She thought that Kencha would not catch up with Accianco or Puppy-chan without the propelling engine, and if Kencha and the mother got separated, which meant all of them would be taken apart from one another.

Immediately after, the whole tunnel looked distorted, and then the space shrank to wrap each body separately.

So they got separated into three groups:

- Puppy-chan and the picture book
- Accianco
- Accianco’s mother and Kencha

to pop out from one black hole each that was distant from one another.

Chapter 3

A Night in the Wonderland



Each of them finds him- or herself in a nightscape of the Wonderland.

3.1 Nightscapes

Puppy-chan and Simoiida

Puppy-chan fainted by the shock of popping out of the hole.

When he woke up by the nice smell of warm milk, he found himself near an open-air fire. In front of him, there was a plate with hot milk in it. Across

the fire, he could see a young woman with long hair sitting on a blanket laid over the stony rough ground. Puppy-chan noticed that there was a blanket underneath him, too, which felt soft. He could hear the sound of a water flow nearby. He looked around, and figured that he was in a dry riverbed although it was too dark to tell. The firewood in the open-air fire crackled, and the fire was waving sometimes by the quiet wind.

Puppy-chan felt comfortable even though he was in a strange land. Perhaps it was because the young woman across the fire looked somewhat like Accianco's mother.

Puppy-chan was vacantly still for a moment, and then leapt on his legs all of a sudden, realizing something important.

"No! The picture book is gone!"

The young woman picked up a book on her side.

"Is this the one?"

"That's Accianco's book."

"I know."

"Do you know Accianco?"

She did not answer the question.

"When the morning comes, let's go to the town with the book. Then I am sure that *they* will find Puppy-chan."

Puppy-chan was a little shocked because the young woman seemed to know not only Accianco, but also Puppy-chan.

"Who are you?"

"Me?" The young woman introduced herself. "I am Simoiida."

Accianco's Mother and Kencha

Accianco's mother and Kencha were walking on a country road in the Wonderland. They could hear croaking sounds of frogs. Many stars were there in the clear sky. Since there was no light, and it was too dark, Kencha's magic-light was lighting their feet. Kencha did not seem to be working well, and the mother supported his body. Their progress was slow.

"I am sorry, Accianco's mom. There seems something wrong with me."

Kencha felt responsible for what happened in the tunnel, and he kept apologizing to the mother. It seemed as if part of Kencha's circuits was broken when he was like struck by a lightning in the tunnel.

"No, what happened has happened, and the first thing we need to do is to fix you, Kencha."

Kencha had always been counted on when something happened, but he would not be able to show his power if he was broken.

“I think we need to go to *Suttokoholm Institute of Science* for that.” The mother said.

Kencha felt that he should agree, because he must be able to be repaired in the institute of Dr. Suttokoholm who had invented many things.

Then, a night bus with a classical design approached them quietly from their back, and stopped at the side of Accianco’s mother and Kencha. That was not a bus stop, but the driver must have been kind enough to stop the bus for the mother and Kencha who were walking on an uninhabited country road.

The door opened, and the conductor of the bus got off.

“Are you two all right?”

Accianco’s mother and Kencha did not know how to explain.

“This bus goes to the town. Would you like to get on?”

It was their first priority to go to the town in order to get to Suttokoholm Institute of Science. But the problem was the fare for the bus. The mother knew that in the Wonderland, children, robots and puppies could ride trains for free, because Accianco told her so. Therefore, she could guess that Kencha, being a robot, would not be required to pay the fare. But Accianco’s mother was an adult.

“I don’t have money in the Wonderland.”

She did not know what to do, as coming here was so sudden that she did not even bring her credit card with her.

“It’s perfectly all right.” The conductor said. “I know you are not a citizen of the Wonderland, but this robot was manufactured in this country.”

“What?” Kencha was surprised although it was about his own history of life.

Accianco’s mother was quiet.

“Was I manufactured in the Wonderland?”

“Yes. Your parts are equipped with RFID tags that show they were made in the Wonderland.” The conductor said to Kencha, looking at the sensor reading at the small palm-size computer that he held in his left hand.

Kencha realized that he did not know anything about himself.

“Have you got a name?”

“Kencha.”

“Kencha, do you have anything that you can do for people?”

“I can listen to what machines are saying, and translate them for people to understand. Although I don’t feel too good to do it well right now...”

“It’ll be just fine if you do it after you get well.”

The conductor turned to Accianco’s mother to explain.

“Let Kencha, a robot born in the Wonderland, issue an electronic bill of exchange that promises a labor in this country. That will be accepted as

your fare for this bus.”

Accianco and Helmut

About that time, Accianco was sitting on a staircase that led to the door of a white simple house situated at the end of a farm. She was blankly staring at the air. It might have been because of the shock upon popping out of the hole, or because she was separated from others. But she was not crying as she did when she got alone in the Wonderland about one year ago.

After a while, the door of the house opened, and out came a boy who looked like an elementary school student.

“I knew there was a person! A little girl!” The boy told someone behind the door loudly, and came out to walk down where Accianco sat.

“I’m Helmut. And you?”

“Hi, I’m Accianco.”

It looked as if the boy was scanning Accianco with a sensor on the small computer he held in his hand.

“Sorry. I thought perhaps my father could take you home if you were just lost. Accianco, you came from a foreign land, right?”

Accianco nodded.

“It’s cold at night. Why don’t you come inside?”

“Thank you. You are very kind, Helmut.”

Accianco obviously misunderstood Helmut’s name, but he dared not point that out.

The interior of Helmut’s house looked somewhat like that of the house of Accianco’s uncle. Accianco remembered her experiences in the Wonderland one year ago: in the splendid house her uncle made by himself being an architect, she sipped a cup of cocoa that Dr. Suttokoholm made for her although he was blind, with help of the magic kitchen, and she ate spaghetti her uncle made. Accianco realized that she had not eaten her breakfast yet.

The dinner was already over in Helmut’s home, but Accianco was treated a dessert that was left over. It was a baked apple tart Helmut’s mother made.

It was so sweet and nice that Accianco wanted to show her appreciation to Helmut’s mother.

“I give you this.” Accianco said, taking the half-complete play cheque in the amount of *100 cianco* out of her rucksack.

“Oh, dear!” Helmut’s mother looked surprised in a rather exaggerated way. She told that Accianco did not need to give something in return for the tart, and that she should keep the cheque safely.

“Now that your stomach is full,” Helmut’s father started. “Accianco, how and why did you come to this country?”

Accianco told Helmut's family what had happened. Helmut, his father and mother looked very concerned, and started to discuss how they could find Accianco's family.

However, Accianco remained calm, drinking a cup of cocoa that Helmut's mother made for her. She remembered what happened one year ago.

"The great grandpa Suttoko will come for me. So it's all right."

Helmut's mother was startled to hear the name *Suttoko*.

"You don't mean Dr. Suttokoholm."

"Do you know him?"

Helmut's mother operated a remote controller to show something on the display embedded in the wall. It was the midday news she recorded today.

—Good day, this is Araki, your news jockey. Here is a news flash. Early this morning, Dr. Suttokoholm was kidnapped. The identity of the kidnapper or his or her trace has not been confirmed yet. The Hunan District Citizen's Patrol Group and the staff members of the Institute have been searching for Dr. Suttokoholm and the kidnapper. I will relay this video stream to Bettina, a video journalist living in the vicinity of Suttokoholm Institute of Science. —

Accianco could not express her feeling with words, but she felt that she got involved in very difficult circumstances now that she was in the Wonderland while Dr. Suttokoholm, her only hope, was in danger.

3.2 A Tale of Drafts in the Wonderland

Drafts and Promises

Hearing the conductor of the night bus saying that he would let Kencha issue a bill of exchange, the mother thought that Accianco would think of someone named Bill. A bill of exchange, or draft, of course, is a certificate that promises some event or something.

"Someone who received a draft can, by giving it to the person who issued it, receive a service or something that was promised on the draft. Therefore, a draft is valuable as something you give in return for a favor." The conductor was explaining why a draft to be issued by Kencha could be used in place of payment of the bus fare. "The receiver of a draft can also give it to someone else who wants what's promised on it. By doing so the original receiver can receive a different service or something in return from the new holder of the draft, because he or she will be able to use the draft."

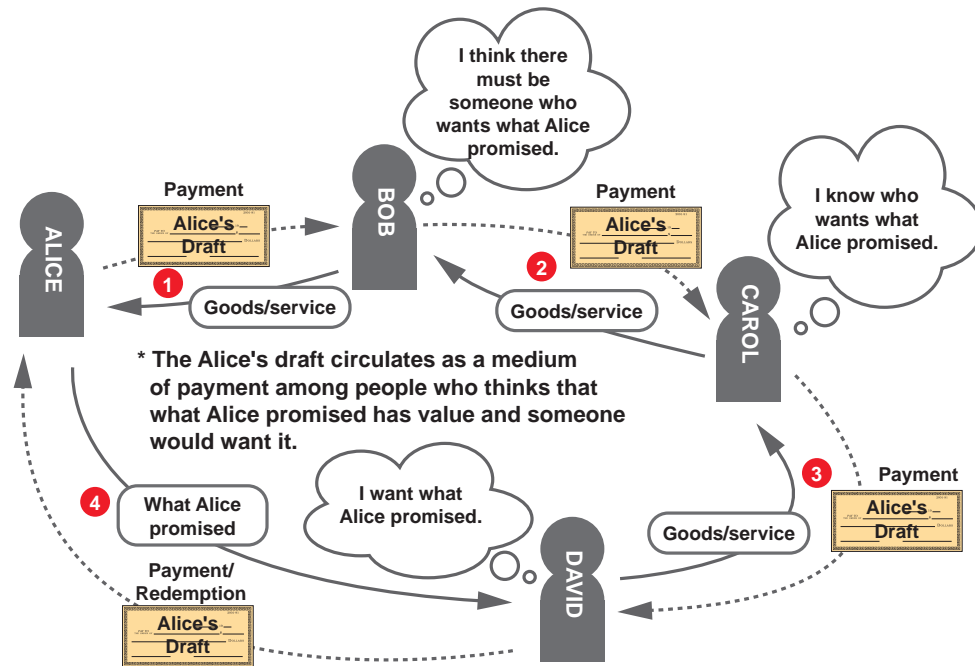


Figure 3.1: Mechanism of Drafts in the Wonderland

On the display on the Kencha's body, what Kencha understood from the conductor's explanation was displayed in the form of a picture, as if he was taking a note.

The conductor cleared his throat as to indicate that his talk was getting to the important part.

"Ahem. And this is important. The receiver of a draft can also give it to someone who thinks that someone must want what's promised on the draft. That's because that someone believes that the draft will be received by someone else. In short, the draft is circulated as a medium of payment among people who think what's promised on it is valuable and someone else must want it."

Because Accianco's mother was employed by herself, she knew how a bill of exchange or draft worked. She also knew that by endorsing, or putting her signature on the back, she could use the draft she received as a medium of her own payment. But she thought that to issue a draft, she needed to open a checking account in a bank just like using cheques, and she needed to be examined by the bank. So she asked the conductor.

"Shouldn't a bank examine Kencha or me before he can issue a draft?"

"There's no bank in the Wonderland." Said the conductor, plainly.

Certainly, Kencha was going to promise a labor, which might make presence of a bank irrelevant in this case. However, the way the conductor had put it clearly sounded as if there was not a bank in the Wonderland regardless of whether it was about issuing a draft or not.

“Now Kencha,” The conductor urged. “Why don’t you issue a draft now. I am sure there is someone who needs your labor in this country.”

Kenchu made an electronic version of a draft that promises that he “will translate a machine language to a human language when returned to the issuer”, and digitally signed¹ it to prove that he genuinely made it. Then he sent the data to the conductor via a wireless channel according to the protocol he was taught by the conductor’s computer.

Kenchu and the mother could get on the bus then, which started again towards the town.

Public Key and Trust

“Kenchu, you made a digital signature when you issued the draft, didn’t you?” Accianco’s mother whispered, trying not to wake other passengers up. “But people in the Wonderland need to have your public key, Kenchu, in order to verify that the signature is genuinely yours, right?”

A digital signature is an application of public key cryptography that uses secret and public key pairs. One year ago, Accianco, Kenchu and Puppy-chan explored the mechanism of digital signatures by a puzzle Dr. Suttokoholm left using a mysterious set that consisted of a box and two keys. In the puzzle, the box closed with a secret key could only be opened by the corresponding public key. Likewise, the data encrypted by a key Kenchu was secretly hiding could only be decrypted by his corresponding public key. Which means that by decrypting some cipher, people having Kenchu’s public key could certainly know that it was Kenchu who had encrypted the data. Roughly speaking, that was how digital signature worked.

“Yes. My public key will be distributed to others through the Internet.” Kenchu whispered back.

“How do people know that your public key is genuine?”

Kenchu’s public key might be replaced by someone else’s when it went through the Internet. To begin with, most people in the Wonderland must not know who Kenchu was. If you were given a public key of someone you did not know, it would be no use to verify authenticity of it. Accianco’s mother found the situation interesting where something seemingly sure to be uncertain had to be made certain.

¹**Digital Signature** (p.143)

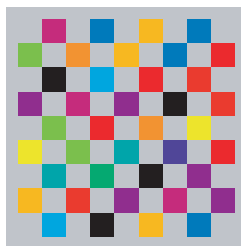


Figure 3.2: The Fingerprint of A Kencha's Public Key.

“Mr. conductor and I exchanged the copies of our public keys via a wireless channel during our face-to-face talking. At that time, we even checked the fingerprints of each other's keys.”

“By fingerprints you mean the hash values of the public keys?”

“Correct.” Kencha answered.

Kencha's public key was actually a really big number whose length was 2048 bits. There is a certain way of calculation to squash this data to make it much smaller. As a result, you would get a short 160-bit data, such as follows.

EA4A 634A 1F91 2DED F261 3556 8B18 7FD4 2DED 9F4A

This is a hash value expressed as a hexadecimal number that contains digits between 0~9 and, since we need more letters, alphabets between A~F so that the figure goes up at the count of 16.

The hash value, unlike compression of image or music, is not designed for regaining the large original data after sending them as compressed, small data. Therefore it is impossible to regain the big number by an inverse calculation. But, it is so specifically designed that if the original number is even a little different, it would produce a totally different number. By comparing the hash value calculated after receiving a data through the Internet with the one published by the originator, users of the Internet can make sure that the received data is genuine.

Because the hash value is a 40-figure number in hexadecimal, it is possible for human beings to read it aloud for verification. Such method has actually been used traditionally, but in the Wonderland, the values were often represented as color patterns where one hexadecimal figure corresponded to a color, so that even human beings could tell if there was a difference instantly.

After the conductor and Kencha exchanged the copies of their public keys on a wireless channel, the conductor showed the color patterns of the fingerprints on the display of his small computer, Kencha showed them on the display in his body, so that they could verify the ones they had received from each other were indeed genuine and there was nothing wrong.

“Therefore, Mr. conductor knows that his copy of my public key is genuine. And because he digitally signed on my public key, those who trust Mr. conductor can believe that copies of my public key they receive from him are genuine.”

Accianco’s mother understood that in the Wonderland, public keys were distributed along the connections of people.

The Protocol of the Electronic Draft

Next, the focus of interest of Accianco’s mother shifted to how Kencha’s electronic draft would be used. Kencha’s ability of translating machine languages to human languages was indeed useful, and the mother had asked Kencha for a number of times to use the ability in such occasions like diagnosing the washing machine or printer in the house when they were broken. However, if no one knew such a convenient service existed, the draft issued by Kencha would never have a chance to be utilized. There must be some mechanism for advertisement, Accianco’s mother thought.

“I wonder if they have a server in the Wonderland that collects people’s electronic drafts.”

“There’s no set server or even collection of servers.” Kencha explained. “Those who receive electronic drafts would keep the data in their computers, and then use the data to send when they use the drafts to others. If there were a set collection of servers, it would become the system’s single point of failure, meaning a single weak point that breaks the whole when it breaks. That would make the system vulnerable to attacks and heavy load.”

Kencha pretended to be an expert of the system of electronic drafts in the Wonderland, but he was just taught the protocol from the conductor’s computer.

“OK, then how do people in the Wonderland know about your draft or the translation work you promised on it?”

“It’s as same as distribution of public keys. The information spreads along with the connections of people.”

That actually made sense to the mother. Kencha’s draft would only be used among those people who could believe that the draft was genuine. Therefore, it was only natural that how Kencha’s public key spreads and how the information about the draft spreads are the same.

However, a number of new questions arose in the mind of Accianco's mother now that she knew that there were not any servers to collect electronic drafts.

"What happens if the computer of someone who received your draft gets broken and the data is lost?"

"A copy of the draft is always in my storage, and the data can easily be restored."

"Wouldn't it be possible for the issuer to rewrite the promise when something like that happens, so that it's easier and less valuable than originally promised?"

Of course, Accianco's mother knew that Kencha would not do such a thing, but there are many different kinds of people in the world.

"If the first receiver of a draft loses the data at once, then such a cunning may be a possibility." Kencha answered, examining the protocol. "But, if the draft has already been endorsed and passed to a third person, then the former receiver would keep the data for a while. So if someone did such a cunning thing, then people would know. There's no use of denying, because all draft data are digitally signed."

"If a person still keeps the data of a draft even after endorsing and giving it to someone else, wouldn't it be possible for the person to duplicate the draft and use it again against yet another person?"

Accianco's mother knew that such double spending was always a problem for electronizing payment systems such as electronic money.

Since an electronic draft is a digital data, it can be copied as many times as you want. It is not possible to distinguish among copies. If a same person uses Kencha's draft many times with different people, Accianco's mother thought, then the number of drafts that are returned to Kencha would be multiplied. It means that Kencha's debt is increased, and he would have to keep the same promise again and again although he promised it just once.

"When a draft I issued is used, I always receive a message. The draft is not considered to have moved to the next person unless I reply to the message. Therefore, I know who hold my drafts now, and would definitely notice if the same draft is duplicately used."

At that time, another question arose in the mind of Accianco's mother, but she decided to let Kencha have rest.

Chapter 4

A Mysterious Bank

*While each of the family member starts his or her journey, Accianco's mother, trying to take Kencha for a repair, gets involved in a discussion in front of **Bank of Centricity**.*

4.1 Big City in the Wonderland

Go Out to the Town with a Book

When Puppy-chan awoke, Simoiida was just putting the open-air fire off. The last thing he remembered before falling to sleep was a full of stars in the night sky. But now he saw the blue sky that seemed endless. Puppy-chan felt that it was a reality and not a dream after all that he was separated from Accianco and everyone else.

“Good morning, Puppy-chan.”

The young woman named Simoiida was still there, and still knew about Puppy-chan, Accianco and others.

“Good morning.”

“Let's move.”

They were going to move to the town with the Accianco's picture book. Simoiida had said that then they would find him, Puppy-chan remembered.

“You must be hungry. We will stop by a store to buy some dog foods.”

Puppy-chan wagged his tail.

“I am sorry that I could not catch the exact location except yours, Puppy-chan... But, if we get there, we should not be far away from where others are.”

Simoiida pointed to where futuristic high-rise buildings stood in a line among the green of the forest.

At Hunan City

That was *Hunan City*, the big city with the largest population in the Wonderland.

Meanwhile, the night bus with Accianco's mother and Kencha had arrived at *Port Liberty*, a bus terminal in Hunan City. Port Liberty was itself a high-rise building, around which numerous roads surrounded like spiral staircases. The night bus with Accianco's mother and Kencha also climbed round and round on one of the roads to finally reach the terminal point.

Suttokoholm Institute of Science was situated about 7km apart from Port Liberty. Accianco's mother and Kencha had decided to take the underground railroads nicknamed as *Hunan Tubes* by the citizens and to make connections with other trains to get to the institute.

Along the way, Kencha electronically issued drafts, each promising a small labor in the future, to pay the fare for the trains for the mother. Kencha also issued a draft along the way to buy her a doughnut at a kiosk when she got hungry.

The WAT System

While eating the doughnut in a train, Accianco's mother asked Kencha the question that was bothering her for the whole duration of this journey so far.

"I understand that anyone who wants to use your draft must send you a message. But what if your connection to the Internet was lost?"

"They will wait. If you trust someone, then the payment can be delayed anyway."

Kencha also explained that in the Wonderland, everything was a part of the Internet, and therefore if someone were to be offline, it would not be for a long time.

"OK. Then, what if the issuer escaped?"

Kencha gave an understanding look.

"If someone is irresponsible, then that someone may escape without keeping the promise." Kencha examined the protocol that the computer of the conductor of the night bus taught him. "According to the protocol, the responsibility is then transferred to the first person who received the draft. That person may not be able to give what's promised on the draft, but he or she can negotiate with the user, and replace the promise with the one they can agree to have the same value."

"And if that person was gone?"

"The responsibility is transferred to the next receiver."

"That means..." Accianco's mother realized.

If people keep running away, and the responsibility keeps following the next receivers in the chain, for the very person who is about to receive the draft, the responsibility would reach him or her in the end. Therefore, the final responsibility is held by those who participate in this system of drafts.

Accianco's mother understood that an ultimate mechanism of taking one's own responsibility is embedded in the system of drafts in the Wonderland.

"This mechanism is called the *WAT System*¹ ." Kencha spoke in an explaining way, although he was just repeating what he was taught as a protocol. "A draft is called a *WAT ticket*. People used to use paper versions, but in the Wonderland, they are now using the digitized version called *i-WAT*² ."

"Why is it called WAT?"

"It's spelled W-A-T, but it came from the unit of electricity *watts*. In the beginning, it appears that people used such units as kWh as the unit of values of the promises on their drafts."

That meant that they used cost of electricity to measure the values.

Since this was the Wonderland, the cost of generating electricity using natural energy sources such as the sunlight and wind must have been used as the standard for measuring values of the drafts, Accianco's mother thought.

"It would be burdensome to participate in the WAT System." Accianco's mother talked to herself, putting in order what she understood about the WAT System. "There is always a risk in taking a WAT ticket."

But the same went with an ordinary draft. It can be dishonored at any time, in which case endorsers may need to take partial responsibilities.

"For a person, the possibility of having to take over the responsibility must be small with a WAT ticket on which many people have endorsed before that person." Kencha said, simulating the actual probability of the event.

Suppose every participant would escape from the system by the probability of $\frac{1}{2}$. Then, one's probability of having to take responsibility is $\frac{1}{4}$ if there are two people involved with the ticket before him or her, and $\frac{1}{8}$ if there are three. Incrementing the number of involved people inversely doubles the probability of having to take responsibility. In actuality, the escaping probability must be much lower. It means that one's probability of having to take responsibility is reduced by a much faster pace.

"That makes sense." Accianco's mother went on. "Furthermore, I understand that endorsements are actually digital signatures in *i-WAT*. In order to verify those signatures, valid public keys must be obtained. Which means that people you trust or acquaintances of those people only are likely to be

¹The WAT System (p.144)

²*i-WAT* (p.144)

involved in the WAT tickets you may want to take.”

Moreover, if it is safer when there are more people involved with a WAT ticket before you, it means that the biggest risk is when you are the first person to receive a WAT ticket. Therefore, you would have to examine most carefully when a new WAT ticket is about to appear; you are the person to decide whether the freedom of creating the medium of payment should be allowed for the issuer or not.

The thought of Accianco’s mother went further. The night bus conductor could have asked her instead of Kencha to issue a paper WAT ticket. But he did not. It might have been because not only that *i*-WAT was easier to handle, but also that the conductor figured, quite calculatingly, that Kencha being a robot would not break the promise and escape.

It seemed that in the WAT System, each participant took care of his or her own risk unlike the examination by banks in which someone else was believed to take care. With that taken into consideration, the risk of participating in the WAT System might be lower than intuitively thought.

This was somewhat similar to the system of roundabouts, or intersections without traffic signals, that the mother heard in the adventure story of Accianco, Kencha and Puppy-chan one year ago.

“But, Kencha,” Accianco’s mother had prepared the final question about the WAT System. “Would you not issue more WAT tickets than you could handle?”

Of course, she knew that Kencha would not do so in reality. But, some people might make more promises than their ability could handle. Since those WAT tickets can be used in place of money, people would naturally issue as many tickets as they want in order to have more money they can use, Accianco’s mother thought.

“More promises than I could handle? If I did, my reputation would go down, and my next WAT tickets would not be received.”

WAT tickets, especially those of *i*-WAT, do not circulate in wide areas because they can be meaningful only among the connections of people such as ones in which validity of public keys can be verified. Transactions are usually among people physically knowing one another or their acquaintances, and the rumors would spread very quickly.

However, if a WAT ticket keeps being endorsed and handed to next persons, taking a quite long time before coming back to the issuer, then the fact that the issuer has drawn too many WAT tickets may not be revealed for a long period.

Yet, Accianco’s mother discovered the following by having Kencha simulate using a moderate amount of computing power not to affect his health: for the benefit of each participant’s minimizing his or her risk, it would be

best if the WAT tickets he or she was involved disappear by completing their roles as early as they can, that is, whenever there is a chance that a WAT ticket can be returned to the original issuer, it should be in exchange with satisfaction of the issuer's promise. That is because a WAT ticket in circulation that has your signature on, whether it is for issuing or for endorsement, means a risk to you.

Knowing that Dr. Suttokoholm was Kidnapped

As all questions Accianco's mother had so far were answered, being a curious woman, she began to look around inside the train as if she did not want to miss anything happening in the Wonderland.

Then she stopped her eyes for a while on the display of a small computer held in a hand of an old man sitting next to her. She screamed.

"Grandpa!"

"What?"

The old man must have felt as if it were him who was being called. But he soon realized that she was looking at the display of his computer.

"Oh, I'm sorry. But, may I ask you, sir, about the news on the display?"

"I bet you too are interested in the kidnap of Dr. Suttokoholm."

"The kidnap!?"

On the computer display of the old man were a photograph of Dr. Suttokoholm and an article. It was the first time that Accianco's mother and Kencha learned that Dr. Suttokoholm was kidnapped.

Computers in the Wonderland

"So you are the granddaughter of Dr. Suttokoholm."

Accianco's mother and Kencha had told the old man their circumstances.

"I really admire his science, inventions, thoughts and his way of life in general." The old man said heartily. "He is blind. His legs are not working too well. And yet his contributions to the world must be like hundreds of times greater than my own. Plus he is full of fun."

"May I have a look?"

Accianco's mother was handed the small computer and taught how to use it from the old man, and she read the article on its display carefully. While she was reading, she was anxious to know what had happened to her grandfather, but at the same time, she was surprised by the excellent operability of the small computer in the Wonderland. It fit well in the human palm, and its manipulation interface using fingers was intuitive, and furthermore, the displayed buttons actually changed how they felt when they were pressed.

When a finger pushed a button on the display, the finger would feel a feedback of the button being pushed down. Accianco's mother had not imagined that such a level of technology was readily available to be actually used by people in the town.

"Could you tell me how much this computer is?"

Accianco's mother might have thought that she needed the same type of computer to follow the news of the kidnap of Dr. Suttokoholm, forgetting that she did not bring money with her. She could just have Kencha search for the news on the Internet, but she was confused by the whole situations.

"I don't consider I bought this. It's rather rent than bought, but ..."

The old man seemed to remember something for a moment. "I got it. It cost me like ten old stories."

Accianco's mother thought that his explanation was a some kind of metaphor.

4.2 Mystery of the Bank of Centricity

A Bank Appears

Accianco's mother and Kencha went out of a station to change the train. They were, of course, worried about the kidnap of Dr. Suttokoholm, which was another reason why they would want to hurry to the institute. But Kencha was feeling worse while he was swung a little back and forth in the train. So the mother decided to let Kencha take a rest sitting at a bench, separating the Kencha 3 (leg-part) and being in the sleep mode for a while. Accianco's mother herself was rather tired by walking while supporting Kencha that she had to rest a little, too.

Just then, some noisy voice was heard from somewhere. Accianco's mother turned to the voice to find a pompous stone-built building there. On the entrance of the building, she could read "THE BANK OF CENTRICITY" in big letters.

It was just the last night that she heard from the night bus conductor that there was no bank in the Wonderland. She had also heard many times in the adventure story of Accianco and others that the Wonderland was like the Internet, and ones in the center did not strive in the country. She had heard that there was no capital, no school, no traffic signal at intersections, and autonomy and distributedness were valued in every aspect in the society.

It felt rather strange for her to find something with *centricity* in its name, not to mention a bank, in the Wonderland where ones in the center did not strive.

"I've been saying that the very fact itself, that there is a bank, is strange."

In front of the entrance, a bank clerk wearing a bank uniform and an old woman seemed to have an argument. Feeling somewhat anxious, Accianco's mother walked towards the building.

"You've got to open an account. Then you will obtain interest."

"Not interested."

"Then, borrow money from our bank."

The old woman looked disgusted.

"Borrow money and work for interest? I've had enough of it. That's exactly why I moved to the Wonderland."

"Shut up, and open an account!"

The bank clerk said in an angry tone, but having realized that people, including Accianco's mother, were gathering, he changed his tone and started to make a speech. He must have figured that it would be a good advertisement.

"Just think about it. By concentrating your money in the bank, you can employ tremendous funds. Money will increase infinitely, by using credit creation!"

The bank clerk spoke with exaggerated motions, and looked fixedly at some far away point.

Credit Creation and Enrichment

According to the clerk, credit creation worked as follows:

1. A bank receives money from many depositors.
2. Some of them withdraw their money soon, but many of them keep their money deposited for a long time. It is very unlikely that all the depositors withdraw their money all at the same time. Thus, the bank can keep just a part of the deposited money, and lend the rest to enterprises.
3. The money lent to the enterprises are used for the payments to their business connections.
4. The business connections who received the payments deposit the money to a bank. Then it all goes back to 2.

By repeating this process, money was newly generated on account books, and the money that the bank is said to have would increase. In addition, since enterprises needed to pay the interest, the money would increase more and more.

“However, money does not increase infinitely.” An old man having listened to the speech of the bank clerk said persuadingly.

“Yes, it does. Paper money is just a printed material. By printing, you can increase them indefinitely. Besides, money today is just a number in computers. A number can be bigger and bigger. There is no limit in the world of numbers.”

“Well, definitely, increased money means that we can buy more. It’s good.” A young man having listened to the clerk’s speech said.

Being understood, the clerk looked happy and proud.

“It’s not good that money increases.” The old man said. “Money is a representation of debt. Is it good that debt increases?”

“Money is a representation of debt? What do you mean?”

The young man did not seem to understand the old man’s words.

“Recall the explanation by Mr. bank clerk here carefully. What is the true nature of the money that is said to be increased?”

“Deposits.”

“Something turned itself into a deposit in the middle of the process.”

“...Ah.”

Definitely, if you carefully read the explained mechanism of credit creation by the clerk, you would find that the true nature of the money that is said to be increased is actually someone’s debt.

“Nevertheless, it’s good to have our money increased. We can promote a new industry with the increased money. We can improve and enrich our lives, more and more, limitlessly.” The clerk, with his arms wide open, triumphantly looked up at the sky. “The sky is the limit!”

While listening to what the clerk said, Accianco’s mother was remembering the scene she saw in the rainbow tunnel when she came to the Wonderland. It was the history of the Earth.

“That’s impossible.”

Accianco’s mother started her rebuttal.

Money and Growth

“Your argument is under the assumption that the humanosphere can infinitely grow. That’s just not possible.”

“Who are you?”

Accianco’s mother continued, citing a brief history of the Earth.

Before the so-called industrial revolution, human was spending lives directly utilizing the energy of light that fell down to the Earth from the Sun. Their lives were based on agriculture and forestry that utilized plants growing by water circulation resulted from the heat received from the Sun and

photosynthesis using the sunlight, or fishery that utilized fish involved in the food chain beginning from phytoplankton. The nature owned the driving force of the system of the Earth including the humanosphere (the part of the Earth where human activities are found). That force was the dominant factor to decide the size of the humanosphere.

However, the situations had changed drastically after human began to use underground resources such as coal, oil and natural gas, which are collectively called the fossil fuels. Human started to generate the flow of materials and energy by their own. Because human owned the driving force of the system, if they wanted to grow, it seemed possible to increase the amount of energy they use as much as they want. Thus the size of the humanosphere grew.

“What’s wrong about it?”

The bank clerk tried to cut in the talk by Accianco’s mother for every reason he could find.

“You, let her finish what she has to say!”

The old woman who was first hassled by the clerk scolded him in a strong tone, so that Accianco’s mother could continue.

“But the humanosphere cannot grow infinitely ignoring the balance with the rest of the Earth. It’s partially because the fossil fuels are limited. But even if we move to other energy sources, the humanosphere can only grow on the Earth to a limited extent.”

Accianco’s mother explained as follows.

When the humanosphere grows, the effects of human activities to other parts of the Earth grows. Which is called the environmental problem. If the environmental problem gets severe, it would be hard for human to survive. Some people say “be kind to the Earth” but it actually means “be kind to the human” by maintaining the size of the humanosphere, or else we would not succeed on the Earth.

If the humanosphere looked as if it could continue to grow indefinitely, that must have been because such a rapid growth could be tolerated by the system of the Earth for a short while. That duration of time has only been an instant compared to the whole history of the Earth. Compared to the history of the human, too, it was only a blink of time, or just around the 20th century, in which the world population and the amount of available fossil fuels had satisfied a very special condition.

As Accianco’s mother explained by overlapping the history of the Earth and progress of human civilizations, more and more people appeared to be convinced.

“She is right!”

“Infinite growth is impossible!”

“It’s just not possible!”

There was even a man probably so excited that he said something like this.

“Yes! I saw the history of the Earth myself, too. She is right!”

Experience of the Old Lady

“Just as she explained.”

The old woman who was first hassled by the bank clerk told a story, stating that it was about the country where she was born.

It was a peaceful fishing village by a lake. Day by day, people fished as necessary, to eat by themselves or to sell them in neighbor dwellings. But one day, paper money came to the village. A bank came with the money, and earnestly suggested loans. The fishermen followed the suggestion, bought bigger ships, and began to employ more efficient ways for fishing to fish more and more fishes. They also employed a new way of preservation, so that they could transport and sell fishes at far away places. They needed to earn more and more, because they had to pay back their loan with interest. The fishermen on the other side of the lake were also alerted, and tried to fish more and more fishes faster by even bigger ship and more efficient way of fishing. Every fisherman was desperate to win the competition in order to protect their lives. The lake, unlike money, was not owned by anyone, so that no one really paid any attention to the number of fishes in the lake.

“And finally, there was no fish left at all in the lake.”

Everyone was listening to the old woman’s story quietly.

The bank clerk began to move backwards as the situation for him had gotten worse.

“You will pay for this!”

Leaving with a parting shot, the clerk went back into the building.

As the commotion was over, people left, leaving Accianco’s mother and the old woman alone.

“So, you are from a fishing village.”

“That was a lie.” The old woman said simply. “It was a true story all right. But I did not experience it. I explained what I read on a book written by a scholar named Prof. Binswanger³. There was already paper money around even when I was born.”

The old woman also added.

“What I have experienced is much more awful.” She said quietly. “I sold what I must not sell as a woman.”

Accianco’s mother did not dare pry any further.

³Prof. Binswanger (p.146)

The Center Hymn

“In any case, something strange has begun.”

After realizing that Accianco’s mother was from abroad, the old woman who called herself Lois told her about the strange events that had been taking place in the Wonderland lately.

In the Wonderland, rules are decided in the collection of *Wonderland Fora*, or as some people like to call it by the Japanese name *REN*⁴, in which anyone can participate through the Internet.

Lois was participating in several fora herself, and she noticed that strange lyrics were posted at *National Anthem Forum* where monthly anthem was made.

It was entitled “The Center Hymn”, which went as follows:

Hey, hey, hey, the center strives
Hey, hey, hey, the world survives

We like, we like, Keronpans with jam in the middle
We dislike, we dislike, doughnuts with holes in the middle

Knock those anarchy fellows down
Let’s dance and sing a little
All must be up to right in the middle

Hey, hey, hey, the center strives
Hey, hey, hey, the world survives

⋮

A Keronpan was a frog-shaped bun that Accianco happened to like.

“Of course, nobody took it seriously... But those are uncanny, the lyrics and this *Bank of Centricity*.”

Lady Lois was thinking that there were some disquieting movements to introduce a mechanism in the Wonderland such that the center was to strive.

⁴**REN** (p.146)

4.3 To be, or Not to be Searched

Encryption and Almighty Mimicry Machine

Meanwhile, in Helmut's house, the family and Accianco were having breakfast and discussing what to do. Helmut seemed to have found a hint for searching whereabouts of Accianco's family while he was discovering the detail of her story.

"So, the picture book was given to you by Dr. Suttokoholm."

"Yes. Great grandpa Suttoko gave it to Accianco."

And it was gone far away with Puppy-chan in the rainbow tunnel.

Helmut pulled the display monitor on the living room table towards him, and tapped on the screen.

"It might just be possible to find where Puppy-chan is."

"Really!?"

In the Wonderland, everything was equipped with an RFID tag, and could be determined what it was from the Internet. Using that, it was also possible to trace whereabouts of a certain thing. For example, as Helmut's family ran a farm, using this mechanism the customers of a greengrocery could know that a tomato there was produced in the farm of Helmut's family, and how it was produced and transported to that store. By this, people in the Wonderland could shop with confidence.

This traceability could apply not only to commodities but also to belongings of people in principle. But because allowing it thoughtlessly would lead to invasions of privacy, it is normally the case that other people were not allowed to trace the whereabouts of one's belongings, Helmut explained.

"Those are kept secret using encryptions."

The word *encryptions* reminded Accianco of the event one year ago.

"I know that. It's about Accianco-Bot."

"Accianco-Bot?"

One year ago, when Accianco and her friends visited the Wonderland, by Dr. Suttokoholm's mischief, a robot that looked exactly like Accianco replaced her. It was just like impersonation on the Internet. Through the event, Accianco and her friends learned about encryptions.

Accianco-Bot could mimic even secret words or gestures of Accianco soon after they were performed.

"Accianco-Bot is an almighty mimicry machine."

Accianco remembered that Dr. Suttokoholm described Accianco-Bot as such.

"Almighty mimicry machine?"

"Does it sound strange?"

“An almighty mimicry machine is a computer. That’s what I learned.”

A computer could, by installing a software that runs on it, behave like a word processor, musical instrument, TV, telephone, mail system that deliver messages, etc. Also, atmospheric movements could be mimicked in a computer to make a weather forecast. So, a computer is an almighty mimicry machine that could mimic anything, Helmut explained.

“If Accianco-Bot is an almighty mimicry machine, then maybe it could mimic anyone other than Accianco.”

Helmut remembered a shape-shifting robot in a cinema he saw, which was made out of liquid metal and could turn into anything.

“If Accianco-Bot becomes someone, I can still tell by the public key and secret key.” Accianco said prudishly.

“That’s public key cryptography!” Helmut said, surprised. “You know very well for such a little girl, Accianco.”

Picture Book Pursuit

Helmut decided to put the topic back.

“People’s belongings are not usually made traceable. But when someone lost something or got it stolen, or in the case of a kidnap like this time with Dr. Suttokoholm, the traceability function becomes open for personal belongings as an exception, and anyone can search for whereabouts of such things.”

Since Accianco’s book was given by Dr. Suttokoholm, the last owner of the book was him. Because of this, it was possible that the book was still recorded as a belonging of Dr. Suttokoholm. It was also possible, then, that it was searchable now just like his wheelchair, Helmut thought.

After Helmut operated a computer to search among the list of belongings of Dr. Suttokoholm, the following item was displayed.

8000.6aa6.fc00.0001:

“Explorers! of the Wonderful Internet !”, picture book.

As expected, in the system the book still belonged to Dr. Suttokoholm.

Helmut did some operations to show the map of Hunan City on the computer display.

“Puppy-chan is in the town!”

More precisely, they discovered that the book that was gone far away with Puppy-chan was moving in the town. The map on the computer screen captured the trace of the movement.

“Ngamo!”

However, they should also remember that anyone including the Hunan City Citizen’s Patrol Group could access the same information. It could be that the book was discovered by them and being transported to somewhere. But, Helmut and Accianco could by then be certain that it must be Puppy-chan who was carrying the book. That was because they discovered that the book stayed for a while in a dog food shop in a shopping street.

Helmut thought that perhaps Accianco’s mother and Kencha, too, had realized that they could trace Puppy-chan’s whereabouts, and started to make actions.

“OK, Accianco. Let’s go find Puppy-chan!”

Accianco got excited, and expressed her joy by jumping on her chair.

“Would that be all right, Dad, Mom?”

Helmut’s father and mother looked at each other’s face, and nodded. There was no worry about a school because there was not a set school in the Wonderland. Moreover, it was encouraged by everyone that children explore and discover things by themselves in the actual society. And since more than anything, it was meant to be a help for Accianco, there was no reason to say no for the parents.

Hitchhiking to Hunan City

“Are we gonna take a train?”

Accianco was remembering about the trip on train one year ago in which they travelled from Hyururun station to Pompoco station. Changing trains and the mechanism of communication on the Internet was so much alike.

“Around here, there’s no bus or train. But it’s OK. We are gonna hitchhike.”

Accianco and Helmut went out of the house. A short while after Helmut operated his small computer, a vehicle that looked just like the one Accianco’s uncle drove came and stopped by the little two.

“Hi there. I’m Nan.” Opening the door for the driver’s seat a little, a young woman showed her face.

“I’m Helmut.”

“Accianco is, um, Accianco.”

The woman who called herself Nan took a glance at the display of the vehicular navigation system, and said.

“To Hunan City, OK. But I can only take you to Port Liberty. Would that be all right?”

From there, they could take trains. Helmut and Accianco thanked Nan, and got on the vehicle.

“Excuse me, lady, but by any chance, are you Accianco-Bot?”

Accianco had been worried by Helmut’s words that Accianco-Bot might be able to mimic anyone if it was really an almighty mimicry machine. That was the reason why she asked the question.

“Accianco-Bot? What’s that?”

“No, Accianco.” Helmut explained. “This lady is a tailor. She and my mother know each other. I haven’t met her before, but from my mother’s digital signature, I can tell that her public key is a correct one.”

“Yes, Helmut’s mother is a customer of my tailor shop. And I eat vegetables produced in the farm his family runs.” Nan started her vehicle. “Helmut’s parents would feel uneasy if he had to ride a vehicle driven by someone they didn’t know, don’t you think? That’s why we rely on people’s network.”

Since Accianco learned that there was a mechanism in the Wonderland to make certain that people really were whom they were, she decided not to ask someone if she was Accianco-Bot from the next time.

The Army of Centricity Appears

Soon after their departure, the display of the navigation system of Nan’s vehicle was suddenly went blank. Then instead, there appeared an image of a man with sunglasses, wearing a black suit and black hat. The image spoke.

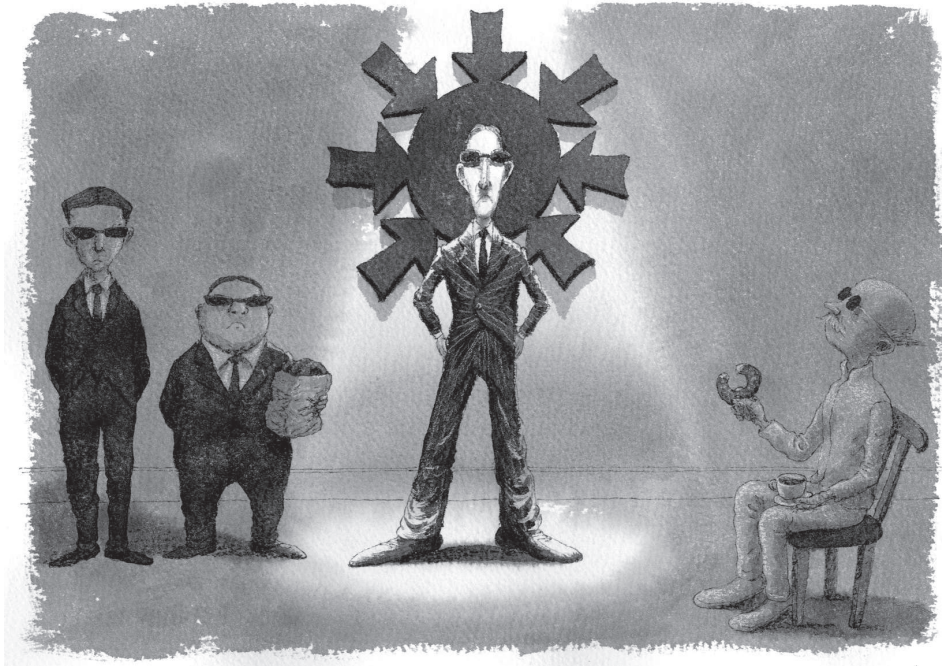
“This image is being sent to all displays to which we have obtained access. This image is being sent to all displays to which we have obtained access.”

The man stopped, as if to indicate that what he was about to say was really important. Then, he opened his mouth again to state as follows.

“Dr. Suttokoholm has been detained by us, *the Army of Centricity*.” The man repeated. “Dr. Suttokoholm has been detained by us, *the Army of Centricity*.”

Chapter 5

The Ambition of the Army of Centricity



Everyone gathers at Suttokoholm Institute of Science in the suburb of Hunan City. Meanwhile, in a room of the secret base of the Army of Centricity, Manaka, the leader, and Dr. Suttokoholm indulge themselves in a heated debate.

5.1 The Ambition

The Leader of the Army of Centricity

In the secret base of the Army of Centricity, the man was walking on a passage, looking satisfied after stating what he wanted to say in the guerrilla broadcast to all displays they could access. The statement included the fact that they have detained Dr. Suttokoholm, the objective of the abduction, and principles of the Army of Centricity.

Before long, the man stopped in front of a room, and told the door to open.

The door automatically opened to reveal that there was Dr. Suttokoholm, a bald old man wearing a white mustache and circular-lens sunglasses, sitting on a normal chair instead of his electric wheelchair. The *braille glove* for his left hand that he used for reading and operating things was also taken off.

With the help of the sound of footsteps, Dr. Suttokoholm turned his face towards the man. Then the renowned scientist said calmly.

“Manaka, aren’t you?”

The man called Manaka did not answer that. Instead, he checked the room temperature displayed on the panel embedded in the wall.

Then there came a small, plump man wearing the black suits running with a paper bag of a confectionery store in his arm.

“Boss, I’ve bought some sweets for you.”

“You idiot, address me as Mr. Leader. You idiot, address me as Mr. Leader.”

“I’m sorry, bo... , I mean, Mr. Leader.”

The man who was obviously a Manaka’s henchman apologized hurriedly, and offered the bag to Manaka. Manaka took a look at inside the bag, and again, yelled at the henchman.

“You are making me eat doughnuts!? You are making me eat doughnuts!?”

Manaka really liked sweets, but with his special principles as the leader of the Army of Centricity, it did not mean that he could eat doughnuts, which did not have centers.

“Bring Keronpans to me. Bring Keronpans to me.”

“I’m sorry. I *did* look for them, but I couldn’t find a single place that sells them...”

Then Dr. Suttokoholm said, reaching his hand towards Manaka.

“May I eat them?”

“Oh, please, help yourself. Oh, please, help yourself.”

Manaka handed the bag of doughnuts to Dr. Suttokoholm, carefully so that the scientist would not drop it.

“Haven’t the foods been enough? Haven’t the foods been enough?”

“Oh, no. I just happen to like these stuff very much. However...” Since Manaka had a strange habit of saying everything twice, Dr. Suttokoholm must have had enough. He said with a sigh. “Could you save just half of your breath.”

So, while Dr. Suttokoholm was eating doughnuts, Manaka and the henchman had a discussion. As a result, the format of negotiation was decided as follows: Manaka quickly whispers something twice in the henchman’s ear. Then, the henchman tells that to Dr. Suttokoholm just once.

“Bo..., I mean, Mr. Leader says that Hunan City has fallen into our hands.”

“Oh, I know.” Dr. Suttokoholm said, in a calm manner. “Could you give me a cup of tea?”

Port Liberty’s Fall

There were diverse reactions by the people in the Wonderland against the Manaka’s message in the guerrilla broadcast. People with strong interest in this problem, which were after all the most of the population in the Wonderland, gathered in the regional *Wonderland Fora* to discuss on the countermeasures.

Because Manaka said everything twice, his speech was made even more difficult to understand. But as people tried to put his assertions in order together, the following items were requested by the Army of Centricity in return for releasing Dr. Suttokoholm.

1. Establishment of the central government
2. Protection of intellectual properties by the government
3. Reinforcement of national power by business development of the intellectual properties

These things are normally done in other countries. But, the Army of Centricity asserted that central government must be established by them. In addition to introducing a mechanism in which the center strives to the Wonderland where the center did not strive, they meant to take over the nation. There was no way that these requests would hit the hearts of the people in the Wonderland.

However, Dr. Suttokoholm was one of the founding parents of the Wonderland, and was sort of a national treasure. Everyone had a special feeling

about him, and if not, the safety of the hostage needed to be considered first anyway.

Nan, who was driving her vehicle carrying Accianco and Helmut in the back seats towards Port Liberty, a bus terminal in Hunan City, was also a fan of Dr. Suttokoholm, and was strongly interested in the kidnap incident.

“When I was a kid, I read an essay on alcohol written by Dr. Suttokoholm, and found it a lot of fun. That was when I decided that I would become a fancy lady who likes to drink.”

On Nan’s chest, there was a transparent pendant with a Chinese character for *sake*, reflecting lights.

“Do you want a Keronpan?”

Accianco took a plastic bag of Keronpan out of her rucksack, and offered it to Nan. Accianco might have tried to change the air in the vehicle that was rather strange after the Manaka’s guerrilla broadcast.

Accianco liked Keronpans very much, but there was something she was not totally satisfied about it now. She had noticed that, although the price did not change, the bun was smaller compared from the previous year. It was not because Accianco grew bigger than the previous year. She could be certain of that because her mother also told that it became smaller when she asked her. Accianco thought that the size of Keronpan was determined by the situations of her own stomach, and she was resenting that it became smaller according to some circumstances in the adult world without her permission.

“No, but I appreciate it, Accianco.”

Nan said, and then suddenly got startled, and kicked down the brake. With a sudden shock, everyone’s body sprawled forward.

“Sorry. Are you guys OK?”

Nan turned to the back seat to find that two children just looked a little surprised.

Wondering what it was, Helmut and Accianco looked further through the front glass of the vehicle. They discovered that the road to Port Liberty was blockaded by a barricade.

On the top of the high-rise of Port Liberty was a fluttering flag with a circle in the center. It was the flag of the Army of Centricity. It was perhaps their intention to, by occupying Port Liberty, one of the important points in the traffic system in the Wonderland, divide the traffic, and to isolate this city from the rest of the nation. The Army of Centricity began to forcibly take over Hunan City, the biggest city in the Wonderland.

Probably, other terminals would be under the same kind of attack. Nan felt the reality of the big danger that the Wonderland was to face.

“Could you take us to Hunan Commons if we can’t get to Port Liberty?” Helmut said, looking at the display of his small computer. “Accianco’s friend

must be there now.”

Nan nodded, and made a U-turn with her vehicle.

Aims of the Army

In a room in the secret base of the Army of Centricity, a negotiation had begun between Manaka and Dr. Suttokoholm.

“Just as same as any other inventions by myself and my colleagues, everything about that technology has been made open to public. It’s free for you to use.” Dr. Suttokoholm said, sipping a cup of tea.

“But in that way we cannot make money.” The henchman said. “says Mr. Leader.”

“That’s worthless nonsense.” Dr. Suttokoholm shrugged to show his amazement. “Perhaps you are planning to claim rights for our inventions, and to collect fees from people who use the technology. That is something unthinkable with the common sense in the Wonderland.”

“The common sense in the Wonderland is a wonder to the rest of the world,” whispers Mr. Leader.”

Manaka was remembering the slogan that became the origin of the name *the Wonderland*. The founding parents named this country as such because they were determined to make a nation with a strange common sense from the eyes of other countries.

“My mother often said ‘If a man will not work, he shall not eat.’ Do you know such a saying?”

“It’s a noble labor to protect inventions that are precious resources for humanity, says Mr. Leader.”

“Well then, if my mother invented the words, and I claimed that I am the valid heir, would you pay me money every time you say ‘If a man will not work, he shall not eat.’?”

“That should fall in the category of fair use¹, says Mr. Leader.”

“I didn’t expect to hear the word *fair* from you.” Dr. Suttokoholm laughed for a moment. “Then, why do we need the concept of fair use?”

“Because if it were not for fair use, our freedom of speech would be obstructed, says Mr. Leader.”

Manaka continued to whisper in the henchman’s ear.

“Of course, our aim is not to restrain people’s freedom by controlling uses of inventions. We would just want to enhance the international competitiveness of the industries of the Wonderland, says Mr. Leader.”

“The Wonderland will do just fine without internationally competing.”

¹Fair Use (p.147)

“Let’s get back to our original topic. Give us all the secrets about that technology, says Mr. Leader.”

“As I said, all information about that technology has already been made open to public. Anyone can freely use it.”

“But, it’s imperfect, says Mr. Leader.”

“Technology or openness? Technology, yes. It’s imperfect.”

“It cannot be. You must be hiding something, says Mr. Leader.”

Dr. Suttokoholm shook his head.

“No. That technology is imperfect. There is no such thing as perfect technology in this world to begin with.”

Reunion at Hunan Commons

Nan’s vehicle got around Port Liberty, and was heading towards Hunan Commons.

“Hunan Commons is an open space.” Helmut explained for Accianco. “Puppy-chan looks like he is in Hunan Commons right now.”

Hunan Commons was the biggest open space in Hunan City. Accianco was so excited with expectation of seeing Puppy-chan again soon.

Soon, Nan’s vehicle arrived at Hunan Commons with full of green. Helmut and Accianco got off the vehicle. Nan, too, got off her vehicle, and made her mind to follow the two children. The scheduled business at Port Liberty could not be carried out now anyway, and she thought that these two children needed some adult to support them, after hearing their situations.

At Hunan Commons, people were spending time in their own ways. Usually, many people were resting between jobs or enjoying picnics. But now was such the time that there was a rock band singing improvised songs to criticize the occupation of Port Liberty by the Army of Centricity, and another guy was talking loudly about a measure for solving the kidnap incident of Dr. Suttokoholm on a wooden box used for carrying fruits named satsuma.

An open space is a place shared by everyone, and therefore anyone can freely use it for any purposes unless other people are troubled by such a use.

“This way!”

Helmut ran on a stone pavement following the track on the display of his small computer. Accianco and Nan followed, trying not to fall behind. Before long, after turning a corner, they found Puppy-chan drinking water at a water facility.

“Puppy-chan!”

Puppy-chan soon realized Accianco’s voice.

“Accianco!”

The two ran towards each other, hugged each other, and jumped again and again. As Puppy-chan intensely pressed his cheek against Accianco, the water around his mouth got Accianco's cheek wet.

"It's cold!"

"I'm sorry. But I'm happy."

Accianco and Puppy-chan could finally see each other again.

Then, there came Simoiida walking with the picture book.

"Hello, I'm Simoiida."

"Simoiida helped me."

The picture book Dr. Suttokoholm gave to Accianco was finally returned to Accianco. She put the book in her rucksack carefully, never to lose it again.

5.2 Targeted Institute

Kencha's Homecoming

Meanwhile, Accianco's mother and Kencha were finally at the entrance of Suttokoholm Institute of Science. Lady Lois, the old woman they had come to know through the affair in front of the *Bank of Centricity*, was with them. Lois also thought, as Nan did, that she should become the travel companion for Accianco's mother and Kencha who were not familiar with the things in the Wonderland.

When Accianco's mother, Kencha and Lois entered the institute, they found a large hologram of the Earth spinning above their heads.

"My universe!"

Accianco's mother was astonished by the unexpected sight. It was because the hologram was showing the history of the Earth from its beginning to the present in a fast forward motion. Beside the hologram of the Earth that floated in the air under the high ceiling of the entrance hall of the institute, there was also a hologram of a signboard on which they could read "SPECIAL EXHIBITION: THE HISTORY OF THE EARTH".

It must have been this hologram at the entrance hall of Suttokoholm Institute of Science that Accianco, Kencha, Puppy-chan and Accianco's mother saw in the rainbow tunnel after jumping into the black hole. It was not the real Earth after all, Accianco's mother thought.

Standing next to Accianco's mother who was looking up the hologram in amazement, Kencha was apparently looking dizzy. Having noticed the peculiarity of the scene, a staff member of the institute approached them.

Once the researcher saw Kencha from a close distance, he got astonished and shouted.

“My, this is Kinetic Electronic Neurosensory Cybernetic Heuristic Analyzer, or in abbreviation, K.E.N.C.H.A.!” The researcher called his colleague standing at the other side of the hall. “Hey, look here. It’s Kencha!”

Then the researcher took a glance at Accianco’s mother, and got astonished again.

“You are . . . Ms. Marimekko!”

Accianco’s mother smiled. The researcher realized that she was the granddaughter of Dr. Suttokoholm. *Marimekko* was a nickname of Accianco’s mother, which Dr. Suttokoholm gave to her when he saw her as a little girl. She really liked the nickname, and had asked her friends in school or even colleagues in her office today to call her Marimekko.

“Kencha seems to be out of order. Can you fix him?”

“We’ll try.”

Kencha was carried by two researchers to some engineering facility in the institute.

Coming Together

At around the same time, in Hunan Commons, the Puppy-chan’s team who had travelled along with Puppy-chan (i.e. Puppy-chan and Simoiida) and Accianco’s team who had been together with Accianco (i.e. Accianco, Helmut and Nan) were telling each other what they had experienced.

Then, a public display near them showed an image of a staff member of Suttokoholm Institute of Science. It was the researcher who talked with Accianco’s mother. The researcher addressed his talk to Simoiida, and told her that Accianco’s mother and Kencha had come to the institute.

“I understand. I’ll be back soon.”

The image on the public display disappeared after Simoiida answered.

“Are you working at Suttokoholm Institute of Science, Simoiida?”

“Yes.” Simoiida smiled. “This will bring everyone together. Let’s hurry to Suttokoholm Institute of Science.”

Everyone got on Nan’s vehicle, and headed towards the institute.

Surrounded Institute

Driving the vehicle, Nan soon realized something was wrong. There were a large number of black automobiles, all of the same type, running towards the same direction as hers. The black automobiles increased their speed, and

went ahead of Nan's vehicles one after another. Each of the automobiles had a flag with a circle in the middle, the flag of the Army of Centricity.

A roaring herd of the black automobiles, as they approaches the building of Suttokoholm Institute of Science, went circularly around the building, surrounded it and stopped. Suttokoholm Institute of Science was besieged by the Army of Centricity!

A little later, Nan's vehicle with everyone on it came. The vehicle ran through the gaps among the automobiles of the Army of Centricity, and was pulled up in front of the entrance of the institute.

Simoiida and Nan got off, and hurried into the institute taking Accianco, Helmut and Puppy-chan. Just inside the institute, Accianco's mother was waiting, looking out worriedly.

"Mom!"

Accianco jumped at her mother.

"A-chan! You're safe! You did it. I'm proud of you."

"Where's Kencha?"

"He's been repaired now." The mother told Accianco a truth. "Kencha was born in this institute."

It was then someone screamed near them. Everyone turned to the voice to find a woman who was visiting Suttokoholm Institute of Science pointing outside, trembling.

As they turned their view, they saw over the glass wall that the members of the Army of Centricity who got off their automobiles were slowly walking towards them. These members wore the black suit uniform, holding assault weapons in their arms such as machine guns.

"Gentlemen, ladies, calm down!"

Simoiida's voice made the inside of the institute quiet.

"Let's escape into the shelter."

According to the direction by Simoiida, staff members of the institute and the visitors ran through a secret pathway to go to the underground shelter. Accianco, Puppy-chan, Accianco's mother, Helmut, Nan and Lois were all together. Even Kencha who was in the middle of being repaired was carried on a movable bed.

In no time, there was no one inside, and stillness flowed in Suttokoholm Institute of Science.

An instant later, armed members of the Army of Centricity entered the institute.

A Strategy Meeting

The underground shelter could function as a meeting room in order for the survivors to plan their strategies. Simoiida skillfully set up equipments, and called everyone around the round table with a hologram projector and a console.

Looking at Simoiida acting as a chair for the strategy meeting, Accianco's mother asked Accianco standing next to her.

"Who is she?"

"She's Simoiida. She helped Puppy-chan."

"Simoiida?"

That name sounded somewhat familiar to Accianco's mother.

"I will explain, to the extent I understand, why the Army of Centricity is targeting this institute."

Simoiida operated the equipment after saying so. Then a hologram of a graphics to describe the mechanism of a wormhole² appeared above the round table. According to Simoiida, a wormhole was like a tunnel between two separate points in space-time, and its name came from a wormhole as in an apple. A wormhole makes a shortcut in space-time by digging a tunnel, just like for a worm, going through a hole in an apple could save distance than going on the surface of it.

On the hologram above the round table, there then appeared something like a blueprint to describe a specific way to make a wormhole in reality.

"This is the space-time tunnel that Dr. Suttokoholm developed, named *Suttoko-Hole*."

Perhaps the name sounded stupid. Simoiida added hurriedly as she felt that she did not receive satisfactory reactions from people.

"Of course, that was a nickname. Formally, this technology is called *Bottomless Suttoko-Hole*."

The visitors to the institute who got unexpectedly involved in this trouble really did not know how to react.

"Dr. Suttokoholm succeeded in development of a stable wormhole that is large enough to be used for transportation purposes, by a special method to make an Einstein-Rosen bridge autonomously maintained. Dr. Suttokoholm calls his method *Bottomless Einstein's Recipe*."

"I didn't understand any of this. But, why don't we just use it to escape from here?" Lois asked.

"The Army of Centricity is perhaps waiting for that."

According to Simoiida, since the way to make a Suttoko-Hole had been made open to public, anyone could actually use the technology freely. How-

²Wormhole (p.147)

ever, making it in reality was extremely difficult. It looked as if the Army of Centricity was aiming to steal the actual Bottomless Suttoko-Hole Generator, or the *Suttoko-Hole Machine* in short, so that they could monopolize the technology.

“Perhaps, as the world’s fuel expenses repetitively fluctuate violently, the Army of Centricity is planning to monopolize the technology of Suttoko-Hole as a novel method of transportation, and to make money out of it.” Then, Simoiida added something sounded mysterious. “Of course, they are mistaken. . .”

“Wouldn’t it be better to have the technology taken than to have our lives taken? Don’t you know the saying ‘run away, and live to fight another day’?” A man, probably a visitor to the institute, pointed out.

“In fact, I personally think it would be the best for us to make a Suttoko-Hole here and run away through it. But, because we are under the influence of the invasion by the Army of Centricity, we cannot increase the power of the machine high enough to make a transportation hole. It only worked a half way last time. . . There’s something we can do with some lower power, which we will show you later.”

Simoiida asked something to a staff member. He nodded, and started some computer operations.

“There is another thing. Suttoko-Hole seems to interfere with Kencha’s circuits. Today’s Suttoko-Hole technology causes trouble when putting a thing with an electronic circuit through the hole. Depending on the types of circuits, the hole might break it.”

No one in the shelter knew, but that was the imperfection of the technology about which Manaka and Dr. Suttokoholm were discussing.

Accianco’s mother had already realized that the black hole her family and herself went through was a Suttoko-Hole, listening to the explanations by Simoiida. It was perhaps Dr. Suttokoholm’s mischief that the trio, Accianco, Kencha and Puppy-chan, was brought to the Wonderland one year ago. At that time, Kencha’s GPS equipment got out of order. But, this time, who brought them to the Wonderland for what purposes?

In a corner of the shelter, the repair of Kencha by some researchers was ongoing in silence.

“Right. Let’s give Kencha a chance to be active.”

Simoiida quickly hit keys to devise a strategic plan, and showed it as a hologram.

“I suggest a plan.”

5.3 Tragedy of the Commons

A Heated Argument

Meanwhile, in the secret base of the Army of Centricity, the debate between Manaka and Dr. Suttokoholm was continuing.

“The shared resources of human race should be controlled, says Mr. Leader.”

Manaka explained with an example of a pasture that was open to anyone, or commons, borrowing the henchman’s mouth.

A ranch owner who uses the commons wonders if he should add another cow to the group of cows he owns. By incrementing the number of cows, the owner would obtain benefits. But since the grass in the pasture is limited, other users of the commons would suffer corresponding shortage of grass. The ranch owner, however, would not suffer because everyone else was paying the cost. Therefore, he concludes, he could add another cow.

If every user of the commons pursued their own benefits, they would all compete with one another, consume as much resources as they needed to win the competition, and thus dash forward to depletion of resources in the end.

This story went exactly like the story of a village that Lois told in front of the Bank of Centricity. But, either Manaka nor Dr. Suttokoholm could possibly know about that.

“The tragedy of the commons³, I know.”

The example Manaka explained through the henchman’s mouth was borrowed from a famous article a biologist named Garret Hardin submitted to a science journal in 1968.

“That tragedy would never happen if the size of the humanosphere is sufficiently small in comparison with the amount of resources provided by the nature. Usually, users of the commons are not motivated to endlessly pursue their own interests. Under that story lies today’s capitalistic economy. Such has happened because we are accustomed to measure values of things with money as the only standard for measurement.”

In the story of the fishing village that Lois told, too, the lake was peaceful until paper money came.

In Hunan Commons, also, no one was really competing to secure their places. There was enough room, and people yielded to use the places in an efficient manner. In Hunan City, people would rarely associate *commons* with *tragedy*.

“Also, I wouldn’t regard ideas of people as properties whose usages need to be controlled.”

³The Tragedy of the Commons (p.147)

Dr. Suttokoholm explained by concisely introducing the thoughts on patents⁴ by Thomas Jefferson, a former president of the United States of America.

1. An idea can be monopolized as long as one remains silent. But, once it is expressed, it is transferred to everyone, and everyone will own it. Moreover, one cannot release the idea he or she once owned.
2. Even after transferring an idea to someone, one does not lose any part of that idea.
3. An idea is like the air; it cannot be monopolized, and works for the goodness of people only after being transferred. It is the natural status of an idea.
4. Therefore, for inventions, at least in such a natural state that there is no government, no one can claim a property's right.

The Wonderland indeed created such a state that there was no government.

To this, Manaka refuted as follows.

“But, the inventors would lose their motivations if their ideas were taken by everyone. We can make such a world where new ideas are continually produced, by protecting ideas, says Mr. Leader.”

“Restriction is not the only way to encourage production of ideas. Look at our institute, for example. We don't restrict the use of our technologies, and yet we have been continuing to produce a lot of ideas. Because to be able to use ideas freely benefits everyone, we should not enforce any restrictions there. Motivations to produce ideas should be found where joy is felt watching his or her own ideas benefiting people.” Furthermore, Dr. Suttokoholm added. “To begin with, any ideas, however novel they may seem, are combinations of existing ideas. In the world where existing ideas may not be used freely, no new idea will be produced.”

“But, it does not allow us to make money, says Mr. Leader.”

Time-Thieves

Silence remained for a while.

“Manaka, have you read ‘*MOMO*⁵’ by Michael Ende?”

“Of course, says Mr. Leader.”

⁴Thoughts on Patents (p.148)

⁵MOMO (p.148)

“Obstructing people from spending free and creative lives, promoting unfairly expansion of the humanosphere, making people indulge in competitions, and lose understanding of how time should really be spent. Manaka, what you do looks like deeds of the time-thieves.”

“No! Says Mr. Leader. The system in the Wonderland in which labor hours of people are sold by the piece should rather be called the deeds of the Timesaving Bank, says Mr. Leader.”

“NEO does not steal people’s time.”

Perhaps having had too much to be tolerant, Manaka shouted with his own mouth in an angry tone.

“I hate NEO. I hate NEO!”

“Manaka, you say everything twice. If there are two same things, they are equivalent, peers, no master nor slave, and there is no center there. Perhaps, in your mind, there always is an anxiety. I think your habit of saying everything twice was earned because you have wanted to deny such an anxiety, and to feel confident in your assertions. But you want to press your centralizationistic claims so much that you lose your own center.” Dr. Suttokoholm then said as if he had seen through the future of Manaka and his army. “The Army of Centricity will lose its center by the very pursuit of centers.”

For a moment, the situation looked bad against Manaka, but he smiled; although Dr. Suttokoholm could not see it, Manaka had read the information on the display embedded in the wall.

“We, the Army of Centricity, have taken possession of Suttokoholm Institute of Science. We, the Army of Centricity, have taken possession of Suttokoholm Institute of Science!” Said Manaka, triumphantly.

Chapter 6

The Mirai-Scope

Because the future has not happened yet, it can always be changed now, says Simo-ida.

6.1 Scope of the Future

Attack of the Army

The armed group of the Army of Centricity searched everywhere inside Suttokoholm Institute of Science after they broke into its building, but they could not find the Suttoko-Hole Machine or the secret entrance to the underground shelter.

At around the same time, in a white simple house in the suburb of Hunan City, Helmut's parents watched anxiously the image in the display on the wall transferred independently by Bettina, a video journalist living near Suttokoholm Institute of Science.

They knew that Helmut was in the institute because of the emergency signal sent from the small computer Helmut carried with him.

—This is Bettina, broadcasting from a vicinity of Suttokoholm Institute of Science. An hour is about to have passed since the siege of the institute by the Army of Centricity. —

Bettina's voice sounded somewhat quiet. It was apparent that she was trying not to be noticed by the members of the army surrounding the institute. At her back, further away, the institute building and the black automobiles surrounding it were visible.

—As you can see, Suttokoholm Institute of Science has been surrounded by the army, and as you know, Port Liberty has been

blockaded by the armed forces. The invasion seems to have been rapidly progressing at many other establishments, and I have come to know that there are lots of people shut out of their offices or cannot even manage to get to their work places.

I think that this invasion by the Army of Centricity that deprives people of their freedom must not be tolerated. They would perhaps want to monopolize our shared resources such as various technologies invented at Suttokoholm Institute of Science, and to collect fees for using such technologies. They would also restrict use of public facilities such as Port Liberty in some ways.

Under these circumstances, allow me to say just this one thing: please remember the discussions by our founding parents of the Wonderland about ten years ago. How a society has allowed income based on property rights such as copyrights, patents, lands and money, and how it has destroyed the world and the planet.

Nevertheless, I suggest, for now, that you all avoid needless confrontations with the Army of Centricity, and stand by in your home. But, in such a case that your house were to be occupied by armed forces, then —

Bettina suddenly moved her eyes away from the camera surprisedly. In that instant, the video camera that must have been fixed by a tripod swayed, and the image was disturbed by some noise.

It seemed as if Bettina was arguing with someone behind the camera.

“Broadcasting without permission is unpardonable.”

That voice, perhaps of a member of the Army of Centricity, was the last thing heard from the broadcast before it was stopped. Helmut’s parents gazed at the blank display in vain.

Then, a music was played indicating arrival of an encrypted message. Helmut’s father operated a computer to show the message from Helmut displayed on the monitor on the wall.

Dad, Mom,

Don’t worry. We will escape from the institute by a secret operation.

And, it looks our future is in trouble.

— Helmut

Another Application of Suttoko-Hole

It was a short while before Helmut sent an encrypted message to his parents saying that they should not worry, as he also saw the Bettina's broadcast in the underground shelter of Suttokoholm Institute of Science. Adults had already begun to work on their contributions to bring a success to the operation Simoiida planned. Because her plan was so extraordinary that no one really agreed with it at first. But, as there was no alternative, they all decided to do their best anyway.

Simoiida called everyone again to come around the round table.

"Could you all come around the table for a moment."

After everyone gathered, something misty appeared as a hologram above the round table.

"Suttoko-Hole can show its extraordinary ability with a much smaller power compared to the application as a method of transportation." Simoiida said. "This is the *Mirai-Scope*, an extension of Suttoko-Hole to the direction of time."

"The Mirai-Scope?"

While many of them could not figure out what it was, a man leaned out his body towards the hologram interestedly. It was the man who suggested to 'run away, and live to fight another day'.

"It's wonderful. You mean, we can see the future with this?" The man asked, because *mirai* was the Japanese word for *future*.

"Yes." Simoiida answered.

"Is it a time machine?" Helmut asked.

"No. You can peep into the future, but cannot go there."

"That's still wonderful." The man gazed at the hologram above the round table. His expression was full of expectations.

"Look. This is the Earth thirty years from now."

As Simoiida operated something, the misty hologram took the shape of the Earth. But, it looked out of focus.

"It looks blurred."

Helmut and Accianco tried to see the hologram in a better condition, and made their faces closer to the image by leaning out their bodies from the rim of the round table. But the three-dimensional image of the hologram still remained to be blurred.

"The future is a set of superpositioned various possibilities, and it necessarily looks very blurred."

The three-dimensional image of the Earth was getting bigger and bigger even as they talked. It meant that the viewpoint of the Mirai-Scope was approaching the surface of the Earth.

“Closer the future you try to peep, more indefinite the elements become. So, if you try to peep into tomorrow, for example, you would just get a white image.”

The man who was leaning out for watching the hologram then looked somewhat disappointed.

“What do you mean...” Accianco’s mother was wondering. “It’s more difficult to see the near future? Wouldn’t one year from today more indefinite than tomorrow?”

“Suppose we show the Earth five hundred million years from now. Then I am sure we will have a very clear image.” Simoiida explained. “By then, the sunlight will have been much stronger than today, which will make the temperature of the surface of the Earth go up, and there will be no life surviving on this planet. That kind of rough outcomes are definite. But concrete series of events to produce such outcomes vary, and every event is indefinite.”

The researcher who was operating a computer next to Simoiida supplemented as follows.

“If we try to peep into some close future like tomorrow or one hour from now, the influences of the very event that we are peeping into the future now will strongly show in that future. That will be another superpositioned possibility on the image, peeping into which will create another influence, and we will get an infinite loop of influences to finally get a white image.”

‘N’ is for ‘NGAMO’

The viewpoint of the Mirai-Scope got even closer to the Earth, and the three-dimensional image now was of a wide ground. It was an image in which many independent views were superpositioned, but roughly speaking, lots of green were lost, and it was apparent that desertification was in progress.

“Let’s pick out infrared radiation.”

Simoiida operated, and in an instant, the three-dimensional image of the ground became thermographically colored.

“The surface temperature went up. ... It looks like a runaway warming.”

Accianco’s mother remembered what Kencha told her in the rainbow tunnel: he explained that the greenhouse effect was restrained because plants absorb carbon dioxide and fix them onto the ground.

Then, at further away, some things with extremely high temperature bursted. The people around the round table saw that many such bursts were rendered in the hologram. When Simoiida switched the image back to normal colors, it became apparent that those were explosions. It looked as if an aerial bombardment was going on.

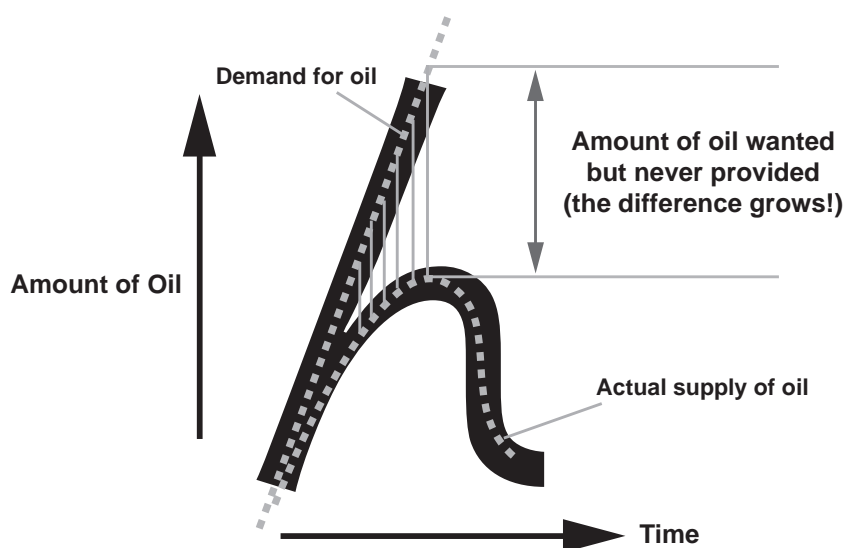


Figure 6.1: ‘N’ is for ‘NGAMO’ and Peak Oil

“Is it a war?” Helmut asked, fearfully.

“I am afraid so.” Simoiida nodded, and then analyzed a possible cause of the war. “Perhaps, human let the Peak Oil¹ reached without any meaningful countermeasures after all.”

“What’s the *Peak Oil*?”

“It’s a point of time at which the growth of oil production in the world stops and turns into a downward slope. We know that oil is buried there, but as digging becomes more difficult, oil becomes less and less usable.”

“Ngamo!”

Perhaps because Accianco suddenly exclaimed, Simoiida seemed to be startled for a second.

“Wow, excuse me. Everyone knows Ngamo is the name of a duck Accianco calls when she is surprised, right?” Then, she soon came up with an idea. “Yes, it’s just like ‘N’ for ‘Ngamo’ spelled in Japanese language. It looks a little like an italicized small letter ‘h’ ...”

The Japanese letter was magnified and shown above the round table.

“The line going upward is the demand for oil. But, the actual amount of oil that we can dig cannot catch up with the demand because we will have to dig deeper and deeper, and we will have to find new oilfield further and further. In fact, it must decrease at some point in time. This means the difference between the demand for oil and the actual supply of oil will grow

¹Peak Oil (p.149)

bigger and bigger, right?”

Everyone including Accianco nodded.

“If there is less supply than demand, the price becomes higher. The price of oil will be incredibly high, and the lives of people depending on oil will go crazy and be broken to pieces.

Is There Hope?

The three-dimensional image produced by the Mirai-Scope went even closer to the surface of the Earth.

“Today, even foods cannot be produced without oil in many other countries, can they?”

As Simoiida said so, Helmut remembered what he had learned from the lecture by the owner of a fish shop in the town. In one country, because the price of oil went up, fishing vessels that burned oil to move could not go for fishing. The lecturer told that it had put many fishermen in the country out of business. In that same country, the increased price of oil had enormous influences over the prices of foods, because their agriculture had used fertilizers and pesticides made out of oil, and it had also used machines that burn oil to cultivate fields.

“The Wonderland is OK for now, but the invasion by the Army of Centricity has made it uncertain in the future...”

“Is the Wonderland endangered by the invasion of the Army of Centricity in the sense of energy use?”

Simoiida answered the question by Accianco’s mother.

“The Wonderland has already completed its transition to use natural energy sources. Therefore, I am not certain whether the energy problem would directly influence this country even with the invasion. However, it is obvious that the Army of Centricity wants to make money. It’s inevitable that the nature is exploited when people want to make money.” Simoiida continued. “And, exploitation of the nature will lead to serious shortage of foods, water and energy. I guess that is why human race will start a war using the last energy available to fight over the small amount of resources that are left over.”

The Mirai-Scope showed where the Wonderland should be. It looked as if the country was also involved with the war, and the land that was once filled with green looked devastated.

They could see a large amount of what looked like paper money whirling in the wind.

Simoiida said, looking at the scene.

“It looks as if money could not buy foods in the end. There will be no one who would give up their foods just because they are given money, while they are about to starve themselves.”

“I see no people.” Accianco’s mother realized, and then continued as if to persuade herself. “But, I guess we cannot see them because people move by their own wills, and that makes them blur heavily.”

But, possibly. . .

“It’s not like there will be no people anymore, is it?” Helmut said, speaking for what everyone was afraid of.

“This is awful. . .” Lois had lost her words for a while, but then spoke with an angry tone. “I haven’t been striving for this future! I don’t accept this worthless future!”

“What are you talking about, old lady.” A man said. It was the man who stared into the image until he found that a close future was not visible with the Mirai-Scope. “I hate to point this out, but thirty years later, I’m sure you won’t be living.”

Lois glared at him penetratingly.

“I’m not worried about myself!”

The man flinched by her fury.

“We are in our position to have borrowed the Earth from children in the future. But, look at this. Look what we have done! How can we apologize to these children?” Lois said, indicating Accianco and Helmut with her hand.

Lois could not stop her anger, and walked towards the man.

“You must have been thinking about gambling back then.”

“No, I wasn’t” He explained. “I was thinking about financing. I was thinking about saving the economy of my country.”

“It’s the same thing.”

Lois had identified where the man came from by his accent.

“Your country imports most of your foods from abroad. Do you have any idea how much water is consumed in the countries where your foods are made? Importing a lot of foods means importing a lot of water², causing water shortage around the world. Moreover, you throw away many of the cooked foods using those imported foods just because they are unsold or even about to remain unsold. You allow such humongous wastes because you can make money out of it. Money is the only standard of value for you. And your government likes to say countermeasures for global warming or climate changes, but actually, you don’t give a damn about the Earth. It’s all about growth, growth, growth. Economic growth over sacrifice of other countries?

²Virtual Water (p.149)

Don't make me laugh! It's your comfortable lives as you say, that will create this future!"

The man could not talk back.

"Why don't you stop there, old lady." Nan calmed Lois who might have still continued. "This man here came to see the Wonderland. It means he wants to solve the problems in his country, don't you think?"

Lois did not know where to direct her anger, and breathed fiercely for a while. Then having recovered her presence of mind to some extent, she came close to Simoiida.

"Hey. Isn't there any hope?"

Simoiida answered. It was the answer she had prepared in case someone asked her the very question.

"Yes, there always is a hope. The future is never dark. What has not happened can always be changed now."

Leaving the words, Simoiida walked away to see how Kencha's repair was going.

6.2 Escape from the Institute

Kencha is Go!

Simoiida came back immediately.

"Repair is complete, everyone. Kencha is go!"

On her side, there was Kencha on the movable bed. He was separated into the three parts: Kencha 1 (head), Kencha 2 (chest) and Kencha 3 (leg).

"Kencha, are you all right?" Accianco ran up to him.

"Yes, I'm OK." Answered Kencha 1. "Accianco, I'm sorry that I let you go in the rainbow tunnel."

Kencha looked utterly lively, although his parts were separated.

"It's OK. But, Kencha, you are in pieces. Are you really OK?"

"This is fine. This is an important mission." This time, Kencha 2 answered.

Then there came three researchers to carry one Kencha's part each to a machinery at the corner of the shelter. It was a set of catapults for emergency communication capsules. Kencha 1 and 2 were set at the machinery first, as there were only two catapults. The researcher who was holding Kencha 3 in his arm was waiting behind the machinery.

Having waited for the right moment, Simoiida commanded.

"Kencha, part 1, part 2. Go!"

With booming sound, Kencha 1 and 2 were shot out. Soon after, Kencha 3 was brought to be set on the catapult.

“Part 3. Go!”

Kencha 3 was also shot out into the air.

The Tossed-About Army

Looking up at the sky, the members of the Army of Centricity just outside Suttokoholm Institute of Science were stirred. It was because three mysterious flying objects were suddenly launched from the top of the institute building, and made a circular flight in the sky above them.

As a member of the army consulted the headquarter, an Image of Manaka appeared on the video phone that looked like a wrist watch.

“Those must be the Suttoko-Hole Machine. Go after them. Those must be the Suttoko-Hole Machine. Go after them!”

Manaka misunderstood that Kencha 1, 2 and 3 that flew out of the institute were the parts of the Suttoko-Hole Machine that can generate *Bottomless Suttoko-Hole*, a small wormhole that Dr. Suttokoholm invented. He figured that the institute staff had to launch them in the air, because they knew that the army members were looking for the machine, and it must have been getting more and more difficult to hide it from the excellent searchers of his army.

The army members, in confusion, got in their automobiles, and started to chase Kencha 1, 2 and 3 in the sky above them. Noticing it, Kencha intentionally flew in a winding way, or had Kencha 1 and 2 cross in the air, and so on. That made automobiles of the Army of Centricity clashed with one another, one after another like a chain-reaction.

Then, when there were only a few automobiles left that could run normally, Kencha 1, 2 and 3 flew away in all different directions.

The remaining automobiles ran after them with their maximal speed, but in no way they could catch up with Kencha 1, 2 and 3 that could fly at the speed of Mach, and soon they lost the flying objects from their sights.

A Secret Escape

Whereas the members of the Army of Centricity were in confusion, everyone taking refuge in the shelter walked through a secret exit to appear at the parking space of Suttokoholm Institute of Science. Then they separated to get evenly on the two buses for tourists that were parked there. Accianco, Puppy-chan, Accianco’s mother, Helmut, Nan, Lois and Simoiida were all on

the same bus. Nan took the steering wheel as she had a citizen's license for driving a bus and was skillful in driving.

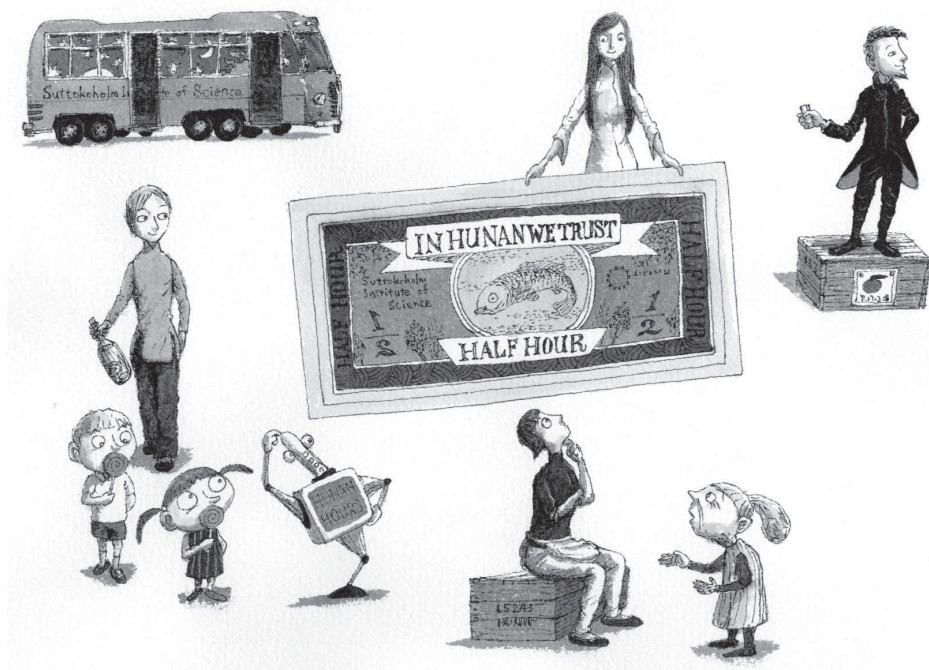
Quietly, silently, they made a secret departure.

Some members of the Army of Centricity noticed the event. But, because they had no automobiles around the institute that could be usable, they had no means for chasing the buses.

The two buses ran away towards different directions from each other, because they figured that they could not be too careful however improbable it was for the army members to be able to chase them.

Chapter 7

NEO in the Wonderland



In Hunan Commons that is turned into a shelter, they learn the mechanism of money in the Wonderland.

7.1 Hunan HOURS

Docking

The bus with Accianco, her family and friends, driven by Nan, was heading towards Hunan Commons as its tentative destination. There was no automobiles running after it.

Meanwhile, parts of Kencha, flying separately as Kencha 1, 2 and 3, gathered at the sky far away from Hunan City, and performed a docking to become one complete robot. Then, faster than ever, Kencha flew at the speed of Mach back to Hunan City.

Kencha was difficult to detect with a radar to begin with, but as planned, he slowed down when he reached Hunan City, and made a very low-altitude flight to avoid being detected by the radars of the Army of Centricity.

Kencha soon caught up with the bus Nan drove, and further slowed down to move in parallel with the vehicle.

The skylight of bus slid open, to which Kencha slowly approached. Then Kencha grabbed the edge of the window with his magic hand, and safely stopped his propelling engine. And he slipped into the bus.

In the bus, everyone welcomed Kencha with an applause.

Accianco, Kencha and Puppy-chan smiled at one another. Finally, the trio was together again.

Another Shelter

The forceful invasion by the Army of Centricity was now ongoing not only at Port Liberty and Suttokoholm Institute of Science, but also at a variety of facilities in Hunan District.

Following which, a large number of people lost their houses and jobs. Hunan Commons was now like a shelter for those people.

Volunteers were supplying foods for hungry people. People with things to spare had brought things they did not need or they had made, to hold a bazaar where they could sell those things. It looked like some festival.

Everyone got off the bus, and looked around the temporary shops opened here and there in the park, as if they were enjoying a brief moment of rest. Nan was evaluating bottles of fruit wine in a shop opened by a person who used to work at Port Liberty. Accianco seemed like she wanted a candy sold in a stall.

Looking at her situation, Kencha decided to issue an electronic draft to promise a labor in the future, as he did for her mother to buy a doughnut

“I’ll issue a WAT ticket. Then Accianco will be able to buy a candy.”

“Kencha, wait.” Simoiida stopped him. “If you use an electronic currency system now, the Army of Centricity may be able to track the transaction.”

Simoiida then took out a bundle of paper money, and distributed the scrips to everyone.

“Please use these instead. This is an anonymous currency called Hunan HOURS.”

Nature and Human as a Nature

The paper money everyone received had the amount printed as $\frac{1}{2}$ *hours*. According to Simoiida, in Hunan HOURS, *1 hour* represented the value of one hour of a labor. If you give *1 hour* worth of paper money to someone, be it a carpenter, dentist or musician, he or she will return the value by working for an hour for the person who gave them the paper money. That was how Hunan HOURS worked.

“Is this the money in the Wonderland?”

Even for Accianco, Kencha and Puppy-chan who had visited the Wonderland before, it was the first time to see the actual money used in the country.

“Actually, under NEO, we don’t have a set money that circulates in the whole country. This is a kind of money used only in Hunan District. A local money¹, so to speak.”

“What’s NEO?” Accianco’s mother asked.

This time, it was Lois who answered the question.

“It stands for New Economic Order. It was named after ‘The Natural Economic Order²’, a book by Sylvio Gessel, an economist. Under NEO, we have decided that the nature and human as a nature must be the standard for money in the Wonderland.”

The standard here was a basis of thinking about values. For example, under the gold standard system, gold is the standard of values. Likewise, under NEO in the Wonderland, the nature was the standard of values.

“OK? Then, everyone. Go buying anything you want.”

“Yahoo!”

Urged by Lois, Accianco and her friends ran for shopping at stalls.

“Simoiida, come with us.”

Urged by Puppy-chan, Simoiida, too, went to accompany the shopping by children.

Accianco’s mother stayed with Lois to learn from her the mechanism of money in the Wonderland in detail.

“How do you actually make a currency whose standard is the nature?”

“Basically, it’s the WAT System.”

“The WAT System!”

“Do you know it?” After asking, Lois soon remembered. “Ah, right. That robot called Kencha paid for your fare with a WAT ticket when we rode a train.”

Accianco’s mother nodded.

¹Local Currency (p.150)

²The Natural Economic Order (p.151)

“Yes. So, is the WAT System the monetary system in the Wonderland?”

“As that girl said, we don’t have any set money that circulates in the whole country. But, the WAT System is an archetype of all mechanisms of money.” Lois explained. “Basically, a WAT ticket promises a thing or a labor. That means, a material or energy. By that, a currency is made based on movements of natural beings.” Lois continued. “In the case of an anonymous currency, its value is backed up by using the WAT System issued by some well-known organization in the community. That Hunan HOURS scrip, each of those, has a corresponding promise on a WAT ticket.”

“Like energy necessary for thirty minutes of labor by a human being in case of $\frac{1}{2}$ hours.”

“Exactly.” Lois smiled. “I knew that you are a fast learner.”

Somehow, Lois seemed to enjoy explaining things to Accianco’s mother.

“An anonymous paper money is a convertible scrip³ to a WAT ticket, as it were. If you bring them to the organization that issues them, they would actually exchange them with WAT tickets.”

Accianco’s mother looked closely at her scrip of Hunan HOURS to find “Issued by Suttokoholm Institute of Science” printed on it.

“I guess, then, it’s not like one hour of lazy working would worth *1 hour* in Hunan HOURS.”

“It always amazes me, I mean, how foreign people think.” Lois laughed. “Of course. Because that wouldn’t satisfy the standard use of energy. If the client thinks, ‘isn’t he or she a bit too lazy?’, then, it was not evaluated as *1-hour-worth labor*.”

“Um, I must say I don’t know much about finance.” Accianco’s mother asked after the preamble. “Is there difference of prices among regions in WAT tickets, too? If there is, then, wouldn’t there be brokers of WAT tickets earning money by using such a difference?”

The difference of prices is information. Accianco’s mother thought that if people can earn money using such information, information could be the standard instead of the nature.

“In principle, it’s possible.” Lois said. “But, mechanisms have been installed that would make such earnings difficult. The values of time or energy would not vary very much among regions, and the WAT tickets would not circulate in wide areas in the first place. Yet, the monetary mechanism in the Wonderland is free, and we don’t prohibit anything. That’s why we just avoid putting a price for information as part of our culture, as our manner of living.”

³Convertible Notes (p.152)

The Motto of U.S. Dollars

Before long, children came back after shopping. Accianco and Helmut had candies in their mouths. Then there came Nan with a bottle of fruit wine, and Lois called everyone to come around her.

“This Hunan HOURS scrip is interesting.” Lois was smiling mischievously. “Do you know what words are printed on a dollar bill of United States of America?”

Accianco’s mother used to live in the States, but she had never looked at designs of the coins and bills there as closely as to be able to answer that question instantly.

Lois took out a one dollar paper money from her pocket, and handed it to Accianco’s mother.

“Let me see, let me see.” Accianco, too, looked closely at the design of the paper money.

As everyone saw, on the back of one dollar bill went the motto as follows.

IN GOD WE TRUST

“That’s what it says. But, this money is also used for exploiting the natural resources and fighting wars.”

Lois said, and put the one dollar bill back to her pocket.

The Motto of Hunan HOURS

Then, what was written on a scrip of Hunan HOURS? Accianco’s mother looked closely at the scrip to discover that the following was written there.

IN HUNAN WE TRUST

Accianco’s mother felt that this motto was very smart. It was kind of making fun of the serious statement “IN GOD WE TRUST”, and moreover, because it was rather difficult to tell the difference between “HUNAN” and “HUMAN” at the first glance, this motto could be easily misread as follows.

IN HUMAN WE TRUST

“Mom, what does it say?”

The mother explained to Accianco.

“Ngamo!”

Accianco felt a wonder in that many things other than the amount were printed on the money.

7.2 The World of Money in the Wonderland

Money and Languages

“Looks strange? But, money circulates because people believe that they can use it. People who use the same money are friends in a way that they believe in the same thing. This is called, in some scholarly field, *shared illusion*. Anyway, that makes it very important to write down on our money with what thinkings we are going to use it.”

“I learned that money is like a language.” Helmut remembered what he learned from the lady in a bakery in a class. “A language is understood because everyone thinks it’s understood.”

Money that was only usable in Hunan District was like a dialect. However, a language is built by those who speak it in the first place. The lady in a bakery explained in a class that it was rather strange for someone to decide the standard language to be spoken in a country, Helmut told.

A language is a medium of exchanging ideas. If there is no appropriate words to exchange ideas between two, the two can create new words they can understand whenever such a situation occurs. If necessary, the invented words can be used by other people.

Likewise, the WAT System had been designed along with the thought that people could create their own money whenever and however they needed.

“Even the money is centerless in the centerless world of the Wonderland.” Accianco’s mother spoke to herself.

“Look.”

Lois pointed to people who were using scrips at a nearby stall. The man at the shop looked at the front and back of the scrip he received from the customer, and explained something after soon returning the scrip.

“The one issued by Suttokoholm Institute of Science is not bad, but by any chance, do you have a bond of Port Liberty? One of my friends works there, and I want to help him.”

The customer took out a bundle of scrips from his pocket, and chose one scrip from the bundle to give it to the shop. Then the deal seemed done.

“That makes me nostalgic.” Lois said. “Just ten years ago, we were all doing like that with paper tickets. Today, those negotiations were partly done by the computers.”

Accianco’s mother understood that just like choosing right words for each conversation, right kind of money were chosen for each transaction in the Wonderland.

In Commemoration of the Invasion

Accianco’s mother just happened to notice that Accianco was holding some kind of a scrip in her hand that was different from Hunan HOURS. It looked like a paper WAT ticket.

“A-chaan, what’s that paper thing?”

“The shop gave this to me as a change”

The mother was handed the ticket to have a closer look. The ticket was folded once, and on its back, it had two tables: one is for endorsement and the other was a calendar that had decreasing number in the unit of kWh by weeks.

Lois came to have a look, and said.

“Ah, that’s an aging WAT ticket⁴ .”

“An aging WAT ticket?”

According to Lois, it was a kind of WAT ticket with which the promised value gets smaller and smaller as time elapses. It was made of paper, but there was a contact address of the issuer printed, and it could be exchanged with its electronic version at any time. The actual values of those tickets are lower than the printed amount, so some cumbersome calculation was necessary. For this reason, an aging ticket was usually circulated in the form of *i*-WAT. But as this was a time of emergency, someone must have started to use the paper tickets to avoid being tracked by the Army of Centricity, Lois analyzed.

“The value of this decreases? Why do you make such a thing?”

“Better than increasing, don’t you think?”

Accianco’s mother remembered that during the debate in front of the Bank of Centricity building, an old man told that it was not good if the amount of money increases as money is a representation of debt.

The mother then closely examined the WAT ticket in her hand, discovering something strange.

“What is this? Isn’t this, well, inappropriate?”

⁴Aging WAT Tickets (p.152)

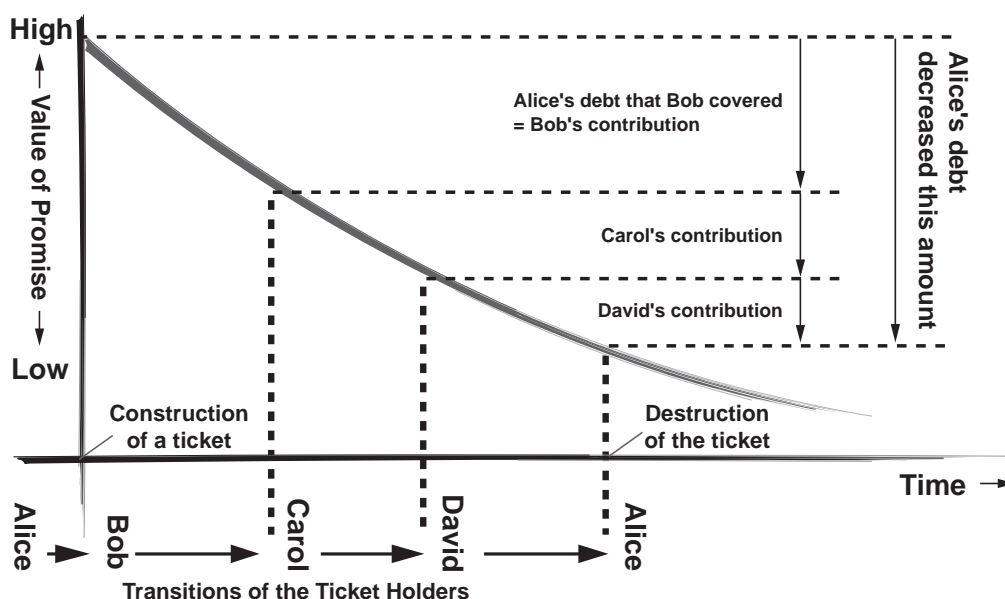


Figure 7.1: An Aging WAT Ticket and Mutual Help

Wondering what she meant, everyone tried to have a look of the ticket in her hand.

“Look. It says ‘In commemoration of the invasion by the Army of Centricity’.”

Indeed, on the WAT ticket it could read “in commemoration of the invasion by the Army of Centricity” next to “The bond of Port Liberty”.

However, although they had surely read it, Lois, Simoiida, Nan and Helmut did not show any expressions in their faces. They did not know what was bothering Accianco’s mother so much.

“Oh, I see.” After a pause, Lois realized. “It’s like taking advantage of every situation.”

Having noticed that Accianco’s mother looked puzzled, Lois seemed as if she had decided to explain the system in more depth.

Aging WAT Tickets

“This is likely to confuse those people who hear it for the first time.”

Lois told Helmut to find a stick, using which she drew a graph on the ground to explain. The vertical axis was the promised value, and the horizontal axis was the time.

“Now, suppose Alice lost her place to live because of the invasion by the Army of Centricity. She would have to live with heavy expenses for a while, which makes her want to issue many WAT tickets, but she doesn’t have time to spare for keeping the promises she would want to write on the tickets. So, she issues WAT tickets such that the amount of promised value decreases as time elapses, that is, aging tickets. For example, if she promises one hour of labor, it would be fifty minutes next week, forty minutes the week after, and so on.

This way, when the ticket comes back to Alice, she can pay back by providing less than what she originally promised. Whereas she must have received values equivalent to what she promised when she issued the tickets. This means that she gained some profit.”

Lois explained so, while she drew a line in the graph on the ground to express the case where the value of a ticket decreases as time elapses. She also marked points of time at which her ticket was issued and it was redeemed.

“A ticket Alice issues as such was received by Bob. The reason why Bob receives such a ticket that its value is reduced once he has it is, of course, he wants to help her.”

Lois grinned there, as if to indicate that that would not really be the reason.

“Reduction of the promised value means that the reduced amount is covered by Bob, doesn’t it? When Bob uses the ticket by endorsing, its value is already decreased. Compared with what Bob did for Alice, what Carol would do for Bob in exchange with the ticket would worth less, like shorter labor hours. Bob’s covering part of her debt is equivalent to Bob’s donating the same amount to Alice.

But, what’s interesting about these tickets is, they are not only about those spirits of charity.

Reasons why Bob would receive the aging ticket that Alice issues are actually manyfold. First of all, everyone knows that Alice lost her house by the invasion, don’t they? By the news, for example. Then, there could be other people who would want to make donations to Alice. Such tickets are more likely to be received than regular ones.

If Bob uses such tickets as early as possible, he can reduce the amount of his donations, and at the same time, he can still appeal to the public that his mind is full of charity, and in fact, he had made donations to Alice.

Suppose everyone thinks that way. Then, this ticket circulates in an incredible speed, and contributes for a lively economy. Those in trouble are helped by donations, and ones around them are helped by the lively economy. This is in fact a mechanism for a mutual help.”

“I see.” Actually, there were more than a few things Accianco’s mother

did not really see. But, she understood that it was a new form of donation system. “It’s totally different from calling for subscriptions like we would normally see.”

“I’m not sure whether those would actually reach the people in trouble. . . . Although there must be people seriously working on it.” Lois did not seem to feel comfortable talking about these activities. “I can’t really help but thinking, who do they think they are? Who are they to believe that they can *give alms* to people, or that they have a power to coordinate givings and distribute them for people’s sake.”

Lois started to walk as if she thought that this talk was over. Everyone else followed.

“I would like to ask you about the lively economy.” Accianco’s mother could not help pursuing things until she could be confident that she understood it. “Isn’t it possible that that helps growing of economy? If NEO sets the nature as our standard, growing of the humanosphere must be avoided. Am I wrong?”

Lois stopped.

“If people got involved in disasters or incidents and their lives were broken, they would want to regain the lives they had before, wouldn’t they?”

“Yes.”

“That’s how human as a nature conducts their lives. The mechanism of aging WAT tickets helps it. That liveliness of economy would only be present as long as there are people in trouble. And that liveliness is needed by the troubled people and people surrounding them in order for the recovery.” Lois ended her talk with this line. “Things to happen happen. Things not to happen will not happen. We all are to decide that.”

A Musician in the Wonderland

They walked for a while to find a man with a beard wearing a black cloth standing on a wooden box of satsuma fruit. The man looked quite popular. Many people came by to do something with short distance wireless communication with him using their computers, and then shook hands with him.

Accianco and all came closer to the man, and talked with him. He called himself DJ Fellini. The name sounded familiar to Nan and Helmut. He was one of the famous musicians in the Wonderland. He said he was evicted from his home studio by the Army of Centricity.

“Now, this wooden box of satsuma fruit is my DJ booth.” DJ Fellini said, in a self-mocking manner.

“We’ve been watching you from over there, but what have you been doing?”

“I’m distributing music data for a mobile clubbing⁵ .”

“What’s mobile clubbing?”

“Um. . . it’s like *flash mob*⁶ *silent disco*.”

Everyone did not know what the words meant.

According to DJ Fellini, a mobile clubbing is an event in which many people gather at a public space such as a train station, coordinated by using the Internet. They remain silent throughout the event, but suddenly, they start dancing as if they were in a discotheque, each listening to their own choice of music with a headphone. It is amusing to see a daily space turning instantly into a dance hall even though there is no music heard, and also to see a space to share the activity of dancing coming into existence even though people are listening to different pieces of music independently. For those reasons, mobile clubbing was getting accepted as a popular culture among young generations, DJ Fellini explained.

This time, he was distributing some new musical tracks for a specific mobile clubbing event, which was being planned to take place right in front of Port Liberty that was occupied first by the Army of Centricity. It was being planned as a protest against their invasion.

“Be careful. They are dangerous.” Lois advised.

DJ Fellini told everyone that he always distributed his new music on streets whenever they were made, not only for the event he talked about.

“Do you sell them?” Accianco’s mother asked.

“Digital data produced in this country are free.” DJ Fellini answered, noticing that Accianco’s mother was from a foreign country. “We, the musicians in the Wonderland, don’t do business like selling recorded music, because we cannot put a price tag on information.”

“Then, you earn by live performances?”

“That’s part of it. But we can print our own money.”

“He means they can issue aging WAT tickets.” Lois helped.

“Yes. We issue WAT tickets promising that we perform live for a certain duration. But that duration of time diminishes gradually. Then, we can use the saved time for composing.”

That made sense to Accianco’s mother.

A musician’s job is to produce information in the form of music. He or she is not productive in a sense that their job does not directly produce flows of materials or energy. If they cannot sell information that is their product

⁵Mobile Clubbing (p.153)

⁶Flash Mob (p.153)

of work, then they need to live by people's grace. This situation, in a way, seemed similar to those of victims of accidents or disasters.

"A fan of your music can help you to continue your musical activities by accepting the aging WAT tickets you issue."

"Yes." DJ Fellini said. "If I can please many people with my music, then probably many people will accept my WAT tickets. If my music cannot please anyone, no one will accept my WAT tickets. I am always tried by all of you, and living under the grace of all of you."

Then, DJ Fellini put his hand over his chest, and bowed like a stage actor would do.

"Well, let's exchange public keys." Lois said, taking out her small computer from a pocket. "I'll join the team if I have a chance."

Lois and DJ Fellini exchanged copies of their public keys, and then showed each other the displays of their small computers to verify the fingerprints of their public keys.

"Ms. Lois," Looking at the display of computer in his hand, DJ Fellini said. "Let's make the national anthem for this month together that will startle the Army of Centricity."

He realized that Lois was a member of the National Anthem Forum.

"I'll think about it."

Lois waved her hand, and they left the DJ Fellini's wooden box DJ booth.

A Thought Experiment: Government Without Tax

"I understand that in the mechanism of aging WAT tickets, the issuers are helped by people, but at the same time, they are tried."

Lois nodded, laughed and tapped on the shoulder of Accianco's mother.

"This is just a thought, but, you wouldn't need tax any longer with it."

Lois explained with a simple thought experiment what would happen if a government used aging WAT tickets.

Suppose that a local government thought it might be beneficial for the people there if a new bridge is made over a river.

In an ordinary manner, the budget for building the bridge would be allocated, contractors selected, and the construction would commence. There would be a series of explanatory meetings for the people, and if strongly objected, it might result in a plebiscite.

With a government without tax, the government issues aging WAT tickets for specific purposes. The contractors would accept them to pay for expenses of the construction. To actually pay for the expenses, the WAT tickets need to be accepted by people surrounding the contractors, such as their business connections, employees, and shops where the employees go shopping.

If the people think, as a consensus, that the bridge is necessary, then the WAT tickets will be accepted. It is not because of principles, but rather that everyone thinks that others would accept them. Accordingly, the contractors accept the tickets issued by the government, and the construction would commence.

If the people think that the bridge is unnecessary, then the WAT tickets will not be accepted. It is because everyone thinks that others would not accept them. Accordingly, the contractors would not accept the tickets, and the construction would not start. If it did, it would certainly be derailed.

“Some people like the idea of consumption as voting. Well then, wouldn’t it be better if the government had people directly vote for the policies? Isn’t it democracy?”

In short, by doing so, things necessary to be made will be made, those unnecessary to be made will not be made, and those requiring further discussion will face a rough going.

Of course, since the Wonderland did not have a government in the first place, this sort of mechanism was not necessary in this country. But in this country, any individuals or organizations could make use of such a mechanism.

“Why don’t you start it in your country, too?”

Accianco’s mother did not know whether to take it as a joke or not.

“Um. . . Lois,”

“Yes?”

“Why do you know so much about economy?”

In general, people in the Wonderland seemed to have been highly educated by thorough realization of teaching among themselves. However, Accianco’s mother thought, ones with such an extensive knowledge as Lois must be rare even among those people.

“Well, I don’t know.”

Lois evaded answering the question.

Chapter 8

A Chase and Escape

Everyone chases the Army of Centricity, and the Army of Centricity chases everyone.

8.1 A Happening

The Bank of Centricity Note

It was then that Puppy-chan came with something held in his mouth.

Everyone looked at Puppy-chan, wondering what it was. Puppy-can, too, looked back at everyone with a worried look.

After an awkward silence, Lois realized, and took a sheet of paper out from Puppy-chan's mouth.

"I picked it up from the ground over there!"

With something in his mouth, of course he could not speak.

On the sheet of paper Puppy-chan gave to Lois was written "The Bank of Centricity Note" It looked like a paper money that the Bank of Centricity issued.

The note had a circle in the middle, the amount printed as *1 manaka*, and the Bank of Centricity as the issuer. But, it did not have a motto printed. On the back of the note, there was a drawing of a Keronpan with probably a plentiful of jam inside.

"What a bumf, a mere scrap of paper." Lois talked to herself. "But, even this circulates as long as everyone holds the same illusion. . ."

A good point was that now everyone could be sure that the Bank of Centricity was a partner of the Army of Centricity, because the design of the note was quite similar to that of the flag of the Army of Centricity. The members of the army must be employed by the Bank of Centricity notes.

Another Kidnap

A bad point was that they needed to leave Hunan Commons soon. The fact that these bank notes circulated around here meant that possibly there were the members of the Army of Centricity around.

Simoiida initiated and coordinated the discussion on the destination. No one had realized, during the discussion, that someone was sneakingly stealing up behind Accianco. It was totally unexpected, perhaps because it was a woman casually dressed, unlike the uniform worn by the members of the Army of Centricity that was a black suits.

The woman quickly reached out an arm from behind Accianco to cover her mouth, then took and held her body under the other arm, and ran.

“Mgago!”

Accianco’s scream was blocked by the woman’s palm, and was not clearly heard. The first one who noticed the event was Puppy-chan, but by then, the woman holding Accianco had already run far away.

Puppy-chan made one hell of a dash to run after them.

“Bow wow!”

The bark was so intense that everyone had finally realized some terrible thing was happening.

“A-chan!”

“Accianco!”

Kenchu floated in the air, and ignited the propelling engine to make a swift take off.

At the time, the woman was already near her vehicle she had parked. She slipped into the driving seat with Accianco under her arm, and slapped the door shut. Vehicles in the Wonderland had a mechanism of automatically setting up seat belts for the drivers, but this time, the belt was not set properly because Accianco’s body obstructed its movement. The warning lamp lit, but the woman quickly overrode the warning, and holding the steering wheel with one hand, she started the vehicle.

Kenchu caught up with the vehicle right after that, and hooked the vehicle’s body with his magic hand. But the vehicle accelerated harder than he expected, so that his magic hand was not firmly hooking. Plus, the vehicle suddenly curved, and Kencha’s body was swung away to the opposite direction.

“Aaargh!”

Puppy-chan ran after the vehicle that drove away.

Pursuit

The vehicle driven by the woman ran fiercely on the roads of Hunan City. Puppy-chan was running after the vehicle frantically, but it was in the middle of a roadway. Many vehicles, honking their horns, drove past Puppy-chan one after another. He could be run over at any time.

Puppy-chan was in danger!

Then there flew Kencha, and he picked up Puppy-chan and ascended. After hovering there for a while, Kencha with Puppy-chan got in the bus Nan drove from its open skylight on top.

Puppy-chan was in low spirits.

“I am so sorry. I lost sight of the car...”

“No. You did fine, Puppy-chan.” The mother said, although she was very worried about Accianco, too.

“No problem.” Helmut said, looking intensively at the display of his small computer. “We can track the vehicle that took Accianco.”

More precisely, they could track the RFID tag embedded in the book inside Accianco’s rucksack. The information was immediately transferred from Helmut’s small computer to the navigation system of the bus. Nan took a glance at the display, and said.

“We’ll take a short cut!”

The bus on which everyone rode took a tight curve at a roundabout.

A Crash

Before long, the bus went through a narrow road between two buildings, and came near the next roundabout. A moment earlier than their bus entered the roundabout, people in the bus saw that the vehicle that took Accianco entered the roundabout from a different direction. But Nan slowed down the bus cautiously.

Meanwhile, the woman who kidnapped Accianco had noticed that a tourist bus for Suttokoholm Institute of Science was running after her vehicle. That had probably made her upset.

She stepped hard on the gas instead of the brake, which made the vehicle speed up instead of slow down. The vehicle violently hit its right side with the base of the monument in the middle of the roundabout, and by its reaction, spun noisily on the road. Sudden braking sounds were heard here and there at the roundabout as others tried to avoid the spinning vehicle that slid aside. A moment later, the woman’s vehicle ran onto a pavement, and stopped after crashing into the trunk of a street tree, breaking its windscreen by the impact.

People in the bus could vaguely see that a person was thrown out from the seat by the inertia, and the body fell on the ground.

Inside the bus, Accianco's mother tried to scream, but her voice was hardly audible.

One That Betrays

Obstructed their way by the vehicles that made sudden stops, Nan had to stop the bus.

Accianco's mother manually opened the door of the bus, jumped out on the road, and ran, looking pale. While running, she was remembering when she made the birth to Accianco. It was not such a long time ago, and the memory revived vividly in her mind. She could feel what she felt when little Accianco who grew big in her womb finally came out to the world after what seemed like an eternal cycles of big and small waves of pain. Accianco was a very, very important girl with a fragment of her life inside, with the future of life inside.

— I don't mind losing my life in return!

Both her grandfather and father being scientists, Accianco's mother grew up not to believe in God. But this time, she could not help but praying to some being beyond her existence.

— Please, save A-chan!

When the mother ran up to where the vehicle crashed, she found that the woman who kidnapped Accianco was lying on her back, holding Accianco tightly in her arms. The woman was lying still. Accianco was not moving at all either, with her eyes closed.

The mother, uttering something that did not become words, unfolded the arms that surrounded Accianco, and then cautiously held the little girl in her own arms.

"A-chan,"

When the mother calmly called her name, Accianco opened her eyes, looking somewhat surprised. For a short moment, her expression was as if nothing had happened, but at the next instant, she began to cry like a fire being set.

"Mom!" Accianco clang to her mother. "Aaaah!"

"A-chan!" The mother, too, held Accianco tightly, crying. "I'm so sorry. It must have been horrifying. Are you OK? Are you hurt?"

The mother touched everywhere on Accianco's body to see whether she was injured, she felt any pain, or not.

It was then that everyone else came. Kencha was there, too, and he

scanned Accianco's body with his magic scanner. After an intensive diagnosis, he looked relieved.

"Good. Accianco is not injured at all."

Everyone was relieved for the time being. Then the woman lying gave a groaning sound.

"nn. . ."

It looked as if she regained her consciousness, but she still was dim. Nan came close to her, bent her knees down to talk to the woman in her ear.

"What's your name?"

"nn. . ."

"What's your name?"

"... Hiromi."

The pochette Hiromi wore on her shoulder was open, and everyone noticed that a bundle of the Bank of Centricity note was stuck out of the bag.

"Have you been employed by the Army of Centricity?"

Lois asked, to which Hiromi nodded, groaning with pain.

"... Our office was occupied, and I was losing my job. ... Then they told me I could become rich, if only I brought the great granddaughter of Suttokoholm ..."

"You are a fool." Lois said pitifully. "A real fool."

Then, Lois continued persuadingly.

"What meaning is there to become rich? Don't you see it's totally meaningless? Because, in this country, you can make your own money for free whenever and regardless of how much you need."

"That's right. . ." Hiromi laughed weakly.

"How long have you been in the Wonderland?" Nan asked.

"... Three months now. ... I was feeling anxious. I've heard there's no insurance company in this country... I didn't know what to do if I got unemployed. . ."

Lois sighed.

It was apparent that Hiromi, who had not been here for long enough, understood little about such mechanisms like mutual help with aging WAT tickets.

"There *is* insurance in this country. Would there be a better insurance than living daily while cherishing the close relationships with your friends and neighbors, and getting ready for helping one another in times of need?"

"Her bones are broken. Severe bruises, too."

Kench reported, after diagnosing Hiromi with his magic scanner.

"We should move her to a hospital." Simoiida said, after looking something up with her small computer. "But no ambulance seems to be able to

come for a long time, because the Army of Centricity has been preventing the move of the emergency medical group of this region.”

“Well, then *we* move her to a hospital? That means we let ourselves be exposed to the Army of Centricity.”

“Let me take her with my vehicle.”

A man offered, who pulled over his vehicle to see if they needed any help.

When they turned around, they found that the roundabout was already back to normal, although vehicles were randomly stopped on the road in confusion only a while ago.

Over the monument, they could see that vehicles ran avoiding their bus on the middle of the road.

Researchers of the institute carefully held Hiromi, and took her to the vehicle of the man who offered the ride to a hospital.

Watching the scene, Lois said to Accianco’s mother.

“This is a rising nation. Not a small number of people are here without understanding NEO.”

The mother posed a question, her face still wet with tears.

“I wonder if the Army of Centricity has been intentionally picking people new to this country to talk into working for them.”

If that was true, then, although she wouldn’t want to think that way, it was possible that there were more people in Hunan City who were spying on them or informing their whereabouts to the army.

Therefore, by a suggestion by Simoiida, they decided to take refuge in a rural town, where they would discuss their next move in detail.

While Kencha controlled traffic, they all walked across the roundabout to get on the bus again, and left Hunan City.

8.2 A Mechanism of Tracking

Another Pursuers

The bus Nan drove and on which everyone rode was running fast on a highway. Because of Kencha’s contribution, there was no member of the Army of Centricity who could follow them from Suttokoholm Institute of Science to Hunan Commons. After that, too, although Hiromi was about to take Accianco away, the Army of Centricity should have no idea where the bus was running, and no one should be able to chase them.

However, after a while, an automobile appeared behind the bus, which hoisted the flag of the Army of Centricity.

So another hard time began for them. This time, it was a car chase on a highway.

Kung Fu Showdown

The automobile of the Army of Centricity increased its speed, and soon caught up with the bus to run in parallel with it. From the window of the automobile, a member of the army leaned out, reached out his arm to grab the window frame of the bus, and then pulled his arm and clang to the bus on the outside. Then the man smashed the windowpane with his fist, and broke into the bus.

People screamed.

The man stood at right in the middle of the aisle as if to emphasize that he was a member of the Army of Centricity, and took a fighting stance of Kung Fu. He seemed to be willing to bring the whole bus under his control by himself.

“Someone, take the wheel!”

Suddenly, Nan stood up from the driver’s seat. Accianco happened to be there, and held the steering wheel at once. But she held it with too much strength, so that the wheel turned, and the bus moved largely away from its course, making everyone reel towards the other side.

People screamed again.

Without a moment’s delay, Kencha reached his magic hand to take hold of the steering wheel, stabilized the course of the bus, and then slipped into the driver’s seat.

But, although the bus must be running straight now, Nan, who was standing to confront the man on the aisle, was swaying left and right. On her hand was the bottle of fruit wine she obtained in Hunan Commons. Nan must have drunk from it. The man was full of fighting spirit with the posture of Kung Fu, but Nan, who was to confront him, was drunk and tottering. It was an unusual sight.

It all happened at the moment when the man slightly moved to launch his attack.

“What!?”

The fight was over while Accianco blinked. The man was lying on the floor, fainted.

The fact was that Nan was an expert of Zui Quan, or Drunken Fist, a technique of Kung Fu using which she would become stronger as she drank more alcohol!

Time to Throw Away

One crisis was gone, thanks to Nan's big contribution. However, as she drank alcohol, she could not drive any longer. Instead, Kencha continued to take the steering wheel of the bus. Kencha made the bus increase its speed to the extreme, and managed to outdistance the automobile of the Army of Centricity.

Behind the bus, people could see that new pursuing automobiles joined, one after another.

They were certain that nobody was after them at least until they left Hunan City. Then why could the Army of Centricity chase their bus?

"Ah!" Simoiida realized. "Accianco's picture book!"

The picture book Dr. Suttokoholm gave to Accianco had an RFID tag embedded, just as any other things manufactured in the Wonderland. Because it was still considered as Dr. Suttokoholm's personal belonging, privacy protection for accessing the whereabouts of the book had been removed since the kidnap of Dr. Suttokoholm.

The facts that Accianco and Helmut could find Puppy-chan in Hunan Commons, and that everyone could track the whereabouts of the vehicle that took Accianco away, owed to RFID. However, removal of privacy protection meant that anyone, not only friends, could do the same thing.

The Army of Centricity must have taken advantage of it, that is, by tracking the RFID tag embedded in the book inside Accianco's rucksack, they could track the bus down until now.

"A-chan, let's throw away the book." Accianco's mother suggested.

The mother knew that there were plentiful of ways to disable identification of the book even in the presence of RFID. For example, they could cover the tag with a piece of aluminum foil, physically break it, reprogram the number in its memory, or accompany it with a special tag that prevents normal readings of the identification numbers.

But, under the circumstances, it would be the best if they threw the book out the window of the bus.

"No!"

"Throw it away, Accianco!" Simoiida too must have thought that it would be quick and the best way to be sure.

"No way!"

As a researcher of the institute reached his arm to her rucksack, Accianco horrifiedly held the rucksack in her arms, and ran towards the last seats in the back of the bus as if to run away from everyone. To Accianco, the book was a treasure she was given by Dr. Suttokoholm. She could not even imagine giving it away, let alone throwing it out the window of a running bus.

“If you don’t throw it away now, Accianco, even if we could get rid of the Army of Centricity this time, soon they will find us again, and chase us.”

“A-chan, please, throw the book away!”

Everyone tried to persuade her, but she kept shaking her head.

Then, Puppy-chan approached Accianco, and talked to her.

“Accianco, everyone is in trouble.”

“The book is mine!”

“If you don’t throw the book away now, everyone will suffer again. Everyone you like, Accianco, will feel scared. And maybe, you won’t be able to take care of the book in the end anyway. Do you still think it doesn’t matter?”

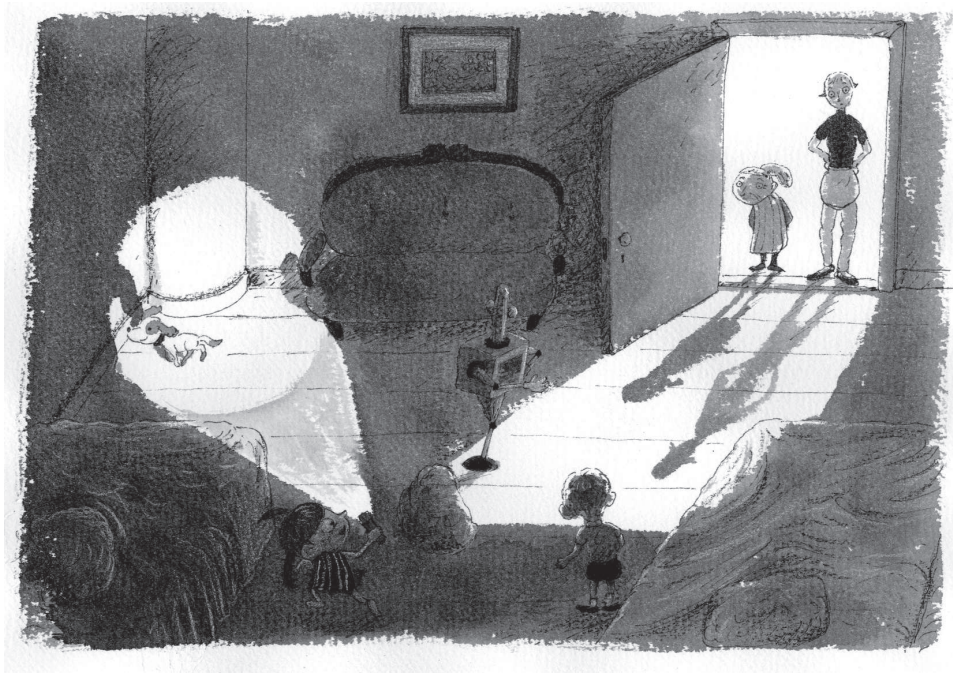
“Ngamo...”

Accianco was silent for a moment. Then, she took the book out from her rucksack, and with her all might, she threw it out the broken window with a shout, which the army member smashed open with his fist a while ago.

Accianco’s copy of the picture book went falling, riffled, and went further down under the overpass on which the bus ran.

Chapter 9

The Birth of Resistanco



In the night, a resistance begins against the Army of Centricity by the friends of the Wonderland.

9.1 Devotion

Truth about Simoiida

Meanwhile, Kencha was feeling a danger.

Right now, the bus was still under a good condition, and it was running at an incredible speed. Usually, this would be considered as a really dangerous

way of driving, but that itself had been taken care of by Kencha's computing power, and so was all right. However, the problem was that he was forcing the bus to do something barely tolerable by its mechanisms, and the motors could be overly heated at any time soon. If that happens, it would be the end.

Having realized the circumstances, Simoiida clenched her fists as if she made a decision, and with a shout, jumped up on the roof of the bus through the skylight. While everyone was taken aback, she made tapping sounds running on the roof of the bus that ran at the speed of almost 200km per hour. Then she jumped off on the road, rolled round and round, leaped to her feet, and stood in the way of the automobiles of the Army of Centricity.

For just a brief moment, the appearance of her changed, and she looked very much like Accianco, and then soon became Simoiida again.

"Ah!"

Everyone uttered a sound of surprise. Simoiida was Accianco-Bot!

Simoiida reached her arms out with open palms, and caught the first automobile with her bare hands. With a heavy crashing sound, the front of the automobile collapsed, and as if falling forward, its back sprang up. But Simoiida remained calm, and lifted the automobile high above with her arms.

"Simoiida!"

"Accianco-Bot!"

Simoiida=Accianco-Bot slowly turned around while she was still lifting the automobile.

"Simoiida!"

Simoiida continued to gaze calmly at the bus on which everyone rode. Everyone could see that a herd of automobiles of the Army of Centricity was coming towards her from her back.

Simoiida looked further and further, and before long, she could no longer be seen from the bus.

The Feeling of Loss

They remained silent in the bus.

There was no pursuer any more, but they lost words for the size of what they have just lost.

"SIM.O.I.I.D.A stands for ..." A researcher of the institute opened his mouth at last. "SIMulated Organism: Imitation of Intelligence, Doings and Appearance ... She was developed to manifest in physical space the abilities of a computer as an almighty mimicry machine ..." The researcher was at a loss for words for a second before he could continue. "But, that courage ... It was not a mimicry at all."

Kench and Simoiida=Accianco-Bot were both robots developed at Sut-tokoholm Institute of Science. Simoiida was a Kencha's sister robot.

From then on, again, they remained silent for a long time.

9.2 Formation of Resistance

In Virna

The bus had arrived at Virna, a suburban town on the edge of Hunan District. It was a town with old-fashioned windmills.

Everyone was apparently lifeless by losing Simoiida who acted as a staff officer in the group.

But, if they did not do anything, they could not return the will of Simoiida who protected them by sacrificing herself. Everyone began to feel that they needed to start something.

And it was started.

"Let's form a resistance." Lois began.

Resistance and Cryptography

"What distance?" Accianco asked.

"It's not distance. A resistance is a movement to resist."

Lois made a proposal to everyone.

"We will counter them by our own, centers-not-striving way, because things that have not happened can always be changed now. If we didn't, how do we apologize to the young woman? Let's spread the network of resistance in this country. We are going to call everyone on the Internet."

"If we use the Internet, wouldn't the Army of Centricity be able to wire-tap?" Accianco's mother posed a question.

"We'll use PGP¹."

PGP (Pretty Good Privacy) was a kind of cryptography with public keys and secret keys. Lois proposed to spread the movement of resistance in the Wonderland without letting the Army of Centricity know about it, by forwarding a message signed and encrypted in PGP through the connections of people.

Accianco, Kencha and Puppy-chan remembered their adventure trip in the Wonderland a year ago. Simoiida=Accianco-Bot impersonated Accianco, and Dr. Suttokoholm taught them how public key cryptography worked using

¹PGP (GnuPG) (p.153)

a puzzle, so that they could have means to tell which one is genuine even if they are facing a computer as an almighty mimicry machine.

“Do you remember the words by your uncle at that time, Accianco?” Kencha asked. “Your uncle said, ‘using cryptography, good guys trying to catch the bad guys can also discuss without the bad guys knowing about it.’ That very thing is going to happen in the Wonderland.”

The uncle also implied that if a government was trying to do bad things, the people could use cryptography to prevent such things from happening. The Army of Centricity was not a government yet, but in a sense that the people were countering against a tyranny, what the uncle said one year ago was indeed going to happen today.

Beginning of Resistance

“Accianco named the movement.” Accianco had come up with the idea of calling the resistance with a different name, because *resistance* still sounded like *distance* to her. “It’s *Resistanco*.”

Accianco made a nickname for the resistance in the same way that she arranged her real name “A-chan” to get “Accianco.”

“It’s cute. Isn’t it a good name?” Lois seemed to like it.

It was really a good name for the movement. It sounded funny, and that had made all of them smile again. Everyone muttered the name, and enjoyed the sound of it.

Hence, *Resistanco* began, as the resistance against the Army of Centricity by the friends of the Wonderland!

Chapter 10

The 133 msec Resistance

The aim of hedge funds that have funded the Army of Centricity becomes apparent by the information provided by Jean-Loup who decides to help Resistanco. The story goes forward to the final confrontation.

10.1 RESISTANCE IS FUTILE

The North Wind and the Sun (1)

The Army of Centricity established the central government the very day they forcibly took the big urban district of Hunan City under their control. They elected their leader Manaka as the president, who immediately started dictatorship.

It did not mean that the whole country was now under control of the army, but the situation was as if the people living in Hunan City became hostages, and it was difficult for the rest of the country to do anything about it.

Manaka ordered his government to make posters, on each of them there was this slogan

RESISTANCE IS FUTILE

printed twice, as that was Manaka's way, and had them posted everywhere in the city to restrain any movements of resistance.

He also announced the following three rules of disallowance.

1. Citizens of the Wonderland may not hold meetings or demonstration parades without permission.

2. Citizens of the Wonderland may not broadcast without permission.
3. Citizens of the Wonderland may not publish without permission.

Furthermore, Manaka disliked the image of the centerless Wonderland so much that he decided to reorganize Hunan City to fit his taste exactly.

As a start, he changed names.

Port Liberty, one of the important points of traffic in Hunan City, was made to change its name to *Port Authority*. A train station called Circus station near Hunan Commons, which was a hub station where many lines of railroads intersected, was renamed to *Grand Central Station*. And Hunan Commons was made to change its name to *Central Park*.

The citizens were indignant at those changes that disallowed them to use familiar names.

Then, Manaka, thinking that educating the citizens was important, established *Central University* in the Wonderland where there had not been any schools, and shrewdly became its first principal.

The next thing Manaka enforced was *Economy Police* by patrolling members of the Army of Centricity. It was to maintain strict control over use of currency so as to disallow any transactions not using the Bank of Centricity notes.

While at about the same time, an encrypted e-mail message to call for participation in *Resistanco*, a movement of resistance proposed by Lois and named by Accianco, was forwarded from people to people, and circulated with dizzying rapidity.

The e-mail message was only passed among the webs of trust that people have spun through daily economic activities such as hitchhiking relations.

The North Wind and the Sun (2)

At that night, in a lodge in Virna, a town on the edge of Hunan District, the promoters of Resistanco, that is, Accianco, Kencha and Puppy-chan, Accianco's mother, Lois, Helmut, Nan and other people they have been traveling with, were discussing their further actions over dinner. At the table, there also was a young man named Jean-Loop, the member of the Army of Centricity who attacked the bus and was knocked unconscious by Nan's Zui Quan.

He was a threat to the safety of everyone's life. and one of the reasons why Simoiida=Accianco-Bot had to sacrifice herself. Yet, everyone welcomed Jean-Loop as a new member of the party. It was partly because he was useful as an informer about the Army of Centricity, but more than that, everyone

had come to realize that Jean-Loop was not a bad guy, through his behaviors in Virna so far.

Several hours ago, in the afternoon that day, Jean-Loop was once released. Everyone did not want to take someone into custody in the first place, even if that someone was a member of the Army of Centricity. Plus, they wanted to avoid leakage of the plans of Resistanco while an army member was there. So they decided to wait until Jean-Loop regained his consciousness, and released him at a far side of Virna. But, he soon came back. He said that he wanted to show the superiority of the centers-striving mechanism that the Army of Centricity had put forth. In that sense, he was a convicted criminal who believed that his deeds were righteous.

Accompanied by Nan just in case, Jean-Loop took children such as Accianco and Helmut to the market in Virna.

On their way, he explained how much possibilities the nature and people of the Wonderland had (to which everyone had no objection), an assertion that only the Army of Centricity could utilize such possibilities, and the meaning of enriched life to him and how the Bank of Centricity could support such a life. He talked about those ideals he believed in a heated fashion.

Jean-Loop had a lot of the Bank of Centricity notes that he has been paid as salaries from the Army of Centricity, and therefore considered himself as a rich person. He thought that he could prove the utility of the Bank of Centricity notes whose values were now guaranteed by the central government, by buying candies to children as a demonstration. However, the Bank of Centricity notes in which he had so much confidence now were not accepted in any stores.

Manaka started the Economy Police because he was worried that situations like that would arise. But it was not functioning in Virna at all, as it was impossible to place one army member/police officer for each citizen in Hunan District.

“Unlike you, many of us, the people of the Wonderland, are not here because of our principles.” The manager of the shop they visited last said to Jean-Loop. “Or rather, those are the majority of us. We are here based on our rational judgment.”

People of the market did not reject the Bank of Centricity notes by some strong beliefs as that of Jean-Loop. But just simply, they reasoned that if they accepted them, they would not be able to use such money that nobody else would accept.

Members of Resistanco warmly welcomed Jean-Loop, who came back dropping his head down.

Network Gift Economy

The topic at the dinner table was the source of funding to the Army of Centricity.

Even though no one in the Wonderland would accept the Bank of Centricity notes, the army could so far purchase weapons and automobiles, and prepare the foods and lodgings for the army members.

If they could discover the source of funding for those, they could also discover a way to counter the Army of Centricity.

“The Army of Centricity has been funded by some foreign corporations.” Jean-Loop said in a honest and simple manner. “In return, the Bank of Centricity notes are issued and given to them, I’ve heard.”

Everyone else wondered what corporations they were and what objectives they had.

“I could only guess.” Jean-Loop said.

“Superficially, it’s about money making.”

Lois analyzed as follows.

The Wonderland had plenty of know-hows to survive in the planet from now on, including state-of-the-art technologies such as Suttoko-Hole and the design of the society that did not depend on fossil fuels at all. The scenario could be like first purchasing large quantities of the Bank of Centricity notes inexpensively, monopolizing the know-hows and foods produced in the Wonderland, and then controlling the export of those resources with the Bank of Centricity notes as the only currency for such transactions. In effect, they would be able to obtain an enormous fortune by making the Bank of Centricity notes the new key currency in the world.

“That’s not the only scenario for money making, though. And in addition, on the underside of all these, I think there is a force that does not approve the economy of the Wonderland.”

“What’s economy?” Accianco asked.

“Exchanging is the basis of our lives.” Lois said, and then pondered for a while to find the best way to explain it to Accianco. “Well, concisely,

1. To make useful things for people, to do useful things for people, or to make people feel pleasant,
2. To share those things with people so that they can experience them, and
3. To use and have fun with those shared things.

Economy is the whole connections of people that are made from those activities.”

NEO (New Economic Order), or the mechanism of economy in the Wonderland, was rather more primitive than advanced, based on relationship of giving and being given among people¹. Such relationship had been gradually replaced by monetary economy in the history of humanity, as the population and the size of economy grew. However, NEO had shown that economy could go just well with the ancient method of giving and being given by ingeniously applying digital technology. Lois probably wanted to say that there were people in the world who did not think favorably of it.

Light in the Darkness

As the evening went on, while the adults continued the strategy meeting, children were put to beds in the next room.

But, the children just pretended to go to sleep. The quartet, Accianco, Kencha, Puppy-chan and Helmut, crept to get up, and in the darkness, started to play a strategy meeting of their own.

After a while, Accianco found a flashlight placed in the room as an emergency light.

Accianco turned the flashlight towards Puppy-chan, and switched it on to cast the beam of light on him. Then Puppy-chan barked, and avoiding the light, ran round and round around Accianco.

As that was a little noisy, Accianco's mother came in from the next room.

"A-chan, you must stop that."

"Now, now, let them play."

Before she knew, Lois was standing behind her, and watching Accianco and her friends play, smiling.

"Light is fast. Can Puppy-chan dodge this?" Wholeheartedly, Accianco followed Puppy-chan with the light of the flashlight.

"Yes, light is fast. It takes only 133 milliseconds for the light to go around the Earth." Kencha said.

"But, doesn't light go straight?" Helmut posed a bit fundamental question. "It's strange that light goes around the Earth, while the Earth is round and light doesn't curve."

"Hmm, the space curves by gravity, so even though light goes straight, it may look as if it curves, but the gravity of the Earth is ..." Kencha kept murmuring.

"Well then, we can relay."

Accianco said, and posed as if she was ready for a race. She used to play a relay race with her friends for a while after watching a track and field game

¹**Gift Economy** (p.154)

on TV. When Accianco, Kencha and Puppy-chan played a relay game, they formed a triangle, and ran to hand over the baton to the next person. Then in the end, the last runner went where the first one originally was.

Puppy-chan borrowed another flashlight from the next room.

When Puppy-chan received the beam of light that Accianco cast, he cast the light forward to Kencha. Kencha flashed his magic eye to send light to Accianco. By doing this, the light came back where it started, although it took longer.

Lois was watching the play, and suddenly, she smiled brightly.

“You’re right, professor.” Lois talked to herself. “In the darkness, we must not forget to turn on the light.”

She seemed to remember something from her past.

“You’d better excuse me, because I have to write an encrypted mail to DJ Fellini.”

Later that night, another encrypted e-mail message ran about the whole country of the Wonderland. While the adults worked hard preparing for something, the children slept peacefully after playing until exhaustion.

10.2 RESISTANCO IS FERTILE

A Cute Resistance

Next morning,

RESISTANCO IS FERTILE

as the slogan, posters were found posted everywhere in Hunan City that had Accianco’s photo on them.

The poster was meant to reveal the existence of Resistanco, a movement of resistance that had already spread in the whole country of the Wonderland, to the Army of Centricity. Also, its design was symbolizing the assertion that this movement of resistance would enrich people’s lives by growing new buds, flowers and fruits, just like a fertile land.

The members of the Army of Centricity, who were patrolling the city under the pretext of protecting the public peace, kept tearing off the posters whenever they found them, but after a while, the posters were found again on the same spots.

Light Goes Around the Earth

Meanwhile, in the surroundings of Accianco and the friends, the new national anthem of the Wonderland for the month was about to be recorded as part of activities of Resistanco. Now the national anthem of the country was, without people's consent, decided by the Army of Centricity (you know, "*The Center Hymn*"). But, the National Anthem Forum made another anthem of the month entitled "133 milliseconds" last night, which was about to be recorded this morning.

The central government that the Army of Centricity made forbade people to broadcast without permission. For this reason, public studios were occupied by the army, and private studios in the houses of news jockeys and DJs were also under their surveillance all the time.

So, Resistanco decided to record tracks independently on streets, and collect their data through the Internet to mix them into one song.

Lois was asked to participate in the song by reading some lines, and accepted the role although unwillingly.

One hundred thirty three milliseconds.

That's how long it takes for the light to go around the Earth.

Let's take hold of a flashlight, and pass the signal on and on.

There were people everywhere on streets, reading these lines aloud.

The song was also sang in many places. Partly, it was recorded in the lodge where the friends stayed last night. A young woman, who worked at the lodge and was asked to sing solo, was a little nervous.

One hundred thirty three milliseconds.

That's the time the light will go around the Earth.

Let's take hold of a flashlight, and pass the signal on and on.

The light will go around the Earth.

The vocal tracks, which contained narrations by Lois and other people and the singing in many places by many people, were gathered and mixed inside a subway train avoiding to be noticed by the Army of Centricity, by a musical unit *Unnecessary Noise Prohibited* and DJ Fellini, and was in no time completed as a song.

The song, the national anthem of the month of the Wonderland, "*133 milliseconds*" got instantly listened to by a large number of people around

the world using P2P (peer-to-peer)² file sharing, without being broadcast at all.

The song, actually, was the theme music for the event about to happen.

The Flash Mob

At around noon, in addition to the offense and defense over posters, a new activity of Resistanco began.

On the streets of Hunan City, a mob appeared with flashlights in their hands. Among the mob, there was a familiar figure . . . It was *you*. Perhaps *you*, too, received the e-mail message of Resistanco, and had to come all the way to the Wonderland because you could not be ignorant.

The central government that the Army of Centricity made forbade people to hold meetings and demonstration parades. However, the people with flashlights walked looking unconcerned, and never talked among themselves, so that it was difficult to tell by just looking that those were the group of people who gathered for the same purpose.

The people gradually stopped to stand while keeping distance from one another, and shortly made one long line. The line traversed Hunan City north and south, and extended further up north.

In the line, here and there, there were Accianco and her friends, whose faces were known to the Army of Centricity, in disguise.

At the same time as the bell in a clock tower rang, Accianco, who was on the edge of the line switched on her flashlight. The next person who saw the light forwarded the beam of light to the next person, and one by one, the relay made the light travel. Puppy-chan, Kencha, Helmut, Accianco's mother, Lois, Nan, Jean-Loop, and *you*, people kept forwarding the signal on and on.

Some people were taking pictures and shooting videos of the scene, but actually, those people were also friends of Resistanco.

Members of the Army of Centricity who were patrolling the city finally noticed that something was going on. But, people in the mob blended into another crowd soon after they sent the signal, and therefore no one was caught by the army.

There were people listening to some music on headphones, and forwarded the signal while dancing. They must be mobile clubbers, friends of DJ Fellini. Some other people were masquerading as some characters. They were having fun! On a lake, people on boats, in a gorge, a person on a hanging bridge,

²P2P (p.154)

people passed the signal on and on. So the signal, the beam of light, went beyond a mountain, and got forwarded north and north.

This was the demonstration by Resistanco, entitled *133 milliseconds*.

The light of flashlight went on and on along the connections of people, and sometimes as a signal from a lighthouse, or sometimes as a light of a lantern on a sailing boat that was crossing the ocean, or sometimes as a signal from a gas-filled balloon, and taking much and much longer time than 133 milliseconds, went around the Earth, and came back.

The Impacts of “133 Milliseconds”

By this demonstration, conceptually, a ring made out of light surrounded the Earth. In its middle, there was the Earth. The ring, being a circle, had no center anywhere on its circumference.

1. We do not want centers.
2. If there is a center, for us living on the Earth, it must be the nature called the Earth.
3. We wish that the nature and human as a nature will become the standard of values.

These assertions expressed by the demonstration “133 milliseconds” struck the world as an intense message.

It took just a moment for “133 milliseconds” to be performed in each region. But as roles had clearly been decided between the people who forwarded the signal of light and the ones who recorded the scene, everything had been able to be played back as images. The central government that the Army of Centricity made forbade people to publish without permission. However, the images of and articles about “133 milliseconds” were made open to public, without going through the cumbersome procedure of publishing, by the people’s blogs and tweets. News media in all countries unanimously broadcast the news based on such resources.

10.3 Collapse of the Army

Leaving Investors

While the world bubbled with the topic of “133 milliseconds”, in the secret base of the Army of Centricity, a meeting was held surrounding Manaka.

The participants of the meeting was talking among themselves for a while, but shortly, began to leave the room one by one.

Manaka was left there, and drooped his shoulders.

The participants of the meeting were representatives of the hedge funds³ that had funded the Army of Centricity. They had intended to earn a tremendous amount of profits using the Bank of Centricity notes at the foreign exchange market. However, now that the world had come to know that the central government established by the Army of Centricity was not a regular government but an invader, the hedge funds decided to back out of their plan, being afraid that their connection with the Army of Centricity would be revealed at any time.

So all the Bank of Centricity notes were sold off, and the funds were withdrawn.

Because the investors, the only people who accepted the notes, had left, the Bank of Centricity notes turned into tons of wastepaper. They did not circulate outside the circle of the army to begin with, but people got utterly disillusioned.

From the president to a penniless man, Manaka fell in an instant.

“Why, why,” Manaka talked to himself. “If the center strives, the world survives. If the center strives, the world survives, doesn’t it? If I become the supervisor of the world economy, if I become the supervisor of the world economy, and everyone entrusts right in the middle, and everyone entrusts right in the middle, that would make the world a better place, that would make the world a better place, wouldn’t it? Isn’t it the righteousness of mine? Isn’t it the righteousness of mine?”

Manaka’s intention, although it was expressed in radical means, was good.

“Righteousness?” The man who was the last person to leave the room stopped, and turned around to see Manaka. “Good or evil, right or wrong in the world, are all like a beauty contest.”

He meant that what majority of people thought as good was good.

“Considering what happened and was viewed by the world, the majority will support the citizens of the Wonderland instead of you. Well, if that’s the case, we will just vote for the side that majority of people will, only earlier.” The man smiled daringly. “One way or the other, we will make profits.”

Then the man left the room. Manaka was left alone, sitting right in the middle of a large room.

³Hedge Fund (p.155)

Saving Dr. Suttokoholm

Around that time, Accianco and friends of Resistanco were watching their opportunity from a concealed place in front of the building of the Bank of Centricity. They had already figured that the bank must be the secret base of the Army of Centricity.

Before long, they could see that army members, in large numbers and looking discontented, came out from the building. It looked as if one half of the objectives of Resistanco had been just achieved. The Army of Centricity, which occupied Hunan City and once built a government of their own, collapsed in an instant.

"I wonder if investors got a great damage from this." Accianco's mother said.

"Well, that's not likely." Lois pointed out. "I'm sure they are hedge funds. They must be prepared for earning profits on either case, whether the Army of Centricity or Resistanco wins. As their name suggests, hedge funds hedge risks."

For example, if the world thought that the nature of the Wonderland, including its foods, valued more than the Bank of Centricity notes, hedge funds would just invest on the side. Probably, they had already been working on it even before the Army of Centricity began invading the Wonderland, Lois analyzed.

"So, one way or the other, those people will win. Is that it?"

"No, that's not likely either." Lois said, smiling mischievously. "Do you think they can buy things in the Wonderland with money?"

The next step for Resistanco was to save Dr. Suttokoholm.

Without difficulty, Accianco and friends entered the building of the Bank of Centricity that had become lax on security, and searched for the room in which Dr. Suttokoholm was held custody. They ran on the complicated passages inside the building, opened the doors one by one to find the scientist. The former members of the Army of Centricity, whom they sometimes encountered, did not do anything but inactively followed them with eyes.

Soon, when they opened the door of a room, they found Dr. Suttokoholm sitting there.

"Hi, that was early." Having felt their existence, Dr. Suttokoholm said.

72 hours after the kidnap, Dr. Suttokoholm was finally rescued.

"Let's get out of this building quickly. I feel something is wrong."

"Oh, that voice must be of Lois."

"Long time no see, professor."

"Do you know her, grandpa?"

“Ha-ha, do I know her?” Dr. Suttokoholm laughed. “She was a member of the group who thought up NEO.”

They all looked at Lois, surprised.

“You are an economist?”

“Oh, come on, stop calling me that.” Lois said, sounding a little embarrassed. “It’s just that I seem to have more experiences than others, so I interfered with the system of this country a little.”

Since they could not find the wheelchair, Jean-Loop and Nan supported the body of Dr. Suttokoholm from both sides.

“I’m honored.” Nan said to his ear.

“Oh, no, *I* am honored, supported by such . . .” Dr. Suttokoholm stopped, and then turned his head to Jean-Loop. “Oh, this young man . . . I’m borrowing your shoulder once again.”

“I am . . . ashamed.”

They headed towards the elevator.

The Burning Bank

At that time, suddenly, it became noisy downstairs, and they heard the wail of an alarm.

It appeared that the former members of the Army of Centricity set fire on the building of the Bank of Centricity!

With voice that denounced Manaka and cracking sounds of glasses, what sounded like small explosions were heard from downstairs.

“Let’s go to the roof!”

As the fire seemed to have started from downward, the only way to go for them was upward. They could expect that the fire group of the district would soon come to put out the fire, now that the Army of Centricity collapsed, and there was no party to prevent them from coming. They could probably buy time until then, and they could even call the citizen’s patrol group to come rescuing them with a helicopter.

While the smoke and heat got worse and worse, they lowered their bodies to go up the stairs, and finally, arrived at the roof.

Only that there was Manaka standing, with a gun in his hand, as if he had been waiting for their arrival.

Chapter 11

The Final Confrontation

Accianco makes a promise. Manaka, Helmut and Kencha also make promises.

11.1 A Gun and the Duck

Transfixion

Manaka, with a gun in his hand, stared at everyone silently.

Accianco held Puppy-chan in her arms. Accianco's mother stood before Accianco and Puppy-chan to protect them. Then, Kencha stood before Accianco's mother and spread his magic hands wide open.

Lois took Helmut's hand, and urged him to hide behind her.

Nan and Jean-Loop took Dr. Suttokoholm down from their shoulders, and stood to confront Manaka.

Manaka was still silent.

"Boss!"

A voice was heard from behind, and a former member of the Army of Centricity came to the scene, running. It was the small, plump man who stood between Manaka and Dr. Suttokoholm when they had a heated debate.

"Boss, don't!"

It was the moment when Manaka's right hand that held the gun slowly began to move.

The Duck on the Roof

Then, Manaka pointed the gun in his own temple, and put his finger on the trigger.

"Ah!"

"Boss!"

“Ngamo!”

Accianco’s mother was startled, and turned around to cover Accianco’s eyes with her palm. Accianco shook her mother’s hand off, and pointing at the sky, screamed again.

“Ngamo!”

They all turned their heads towards where Accianco’s finger pointed, wondering what was happening. They soon realized that something was coming towards them from the sky.

That was *Ngamo*, a bird of passage, a bird of the family Anatidae. Ngamo was flying towards them for real!

The duck glided down at a recklessly fast speed to the roof of the Bank of Centricity building where everyone was, and then hovered right in front of the eyes of Manaka, fluttering its wings. When surprised Manaka raised his left hand trying to brush the duck away, the duck quickly caught him off guard, and took the gun from his right hand with its beak. The duck landed keeping distance from Manaka.

The shape of the duck shifted into that of Accianco for a moment, and then turned into that of Simoiida.

“Simoiida!”

“You are alive!”

“Oh, she won’t die.” Tears were about to come into the eyes of Manaka’s henchman. “This woman here single-handedly annihilated our whole unit.”

“I’m sorry, it was so energy-consuming that I couldn’t move for a while.”

The henchman approached Simoiida, took her both hands, and held them tightly.

“Thank you!”

The henchman wanted to thank her for saving Manaka’s life.

The Sleeping Duck

At that moment, Simoiida suddenly appeared to have lost her entire force, and collapsed.

“Simoiida!”

“Hey, what are you . . . I just held your hands.”

“No, I’m just a bit tired.” Simoiida moved her eyes to Accianco and others who hastened to her. “Accianco, Puppy-chan, Kencha, and Accianco’s mother,” Simoiida tried to smile. “Thank you for saving the Wonderland. It’s now all right here.”

“Accianco didn’t do anything.”

After coming to the Wonderland again through the Suttoko-Hole, Accianco was helped by Helmut, got on Nan’s vehicle, bought a candy in Hu-

nan Commons, got almost taken away by Hiromi, and threw away the picture book Dr. Suttokoholm kindly gave her. All right, she named Resistanco, and her photo was on the poster, but she just passed a beam of light with a flashlight. She did not feel that she did something special to save the Wonderland.

Simoiida did not say anything, and just gave a smile to Accianco.

Then, Simoiida shifted her shape into that of Accianco for a short moment, and then became Ngamo again, and silently closed her eyes.

“Simoiida!”

“She’s all right. She’s just asleep.” Dr. Suttokoholm said, perhaps having detected her sleep-breath. “She needs rest. Just let her sleep.”

Meanwhile, being penniless, and moreover, his gun being taken away, Manaka did not know what to do, except kneeling and sitting down right there hopelessly.

11.2 A Fresh Start

Manaka’s Hereafter

“Well, what are you going to do now?”

Being so asked by Dr. Suttokoholm, Makana raised his head.

“What do you mean what I’m going to do . . .? What do you mean what I’m going to do . . .?”

It was Manaka himself who had done and directed such bad deeds. The only possibility for him to do now was to get himself caught by the police, and judged by the law.

But, Manaka realized. The Wonderland did not have a center. For a country that does not have a center that holds authority, what is the police, or what is the law?

“There is no police in the Wonderland. There is no police in the Wonderland?”

The residents of the Wonderland, such as Dr. Suttokoholm, Lois, Nan and Helmut nodded.

“Of course, you must make amends for what you did.” Lois said. “Therefore, what you are going to do hereafter means a lot.”

Although Manaka had troubled everyone, and got penniless in the end, the Wonderland was kind even to such a failed person. Or rather, it could be an expression of severeness. The question was how he was going to recover.

Gifts from Accianco

Accianco took a bag of Keronpan out from her rucksack.

“I give you this.”

Accianco thought that Manaka would be in trouble after he lost all his money, because then he would not be able to buy anything even when he was hungry.

“Thank you.” Manaka grasped the bag of Keronpan firmly. “Thank you.”

On his hands that grasped the bag, drops of tears fell one after another.

Accianco was about to close the rucksack when she realized that there was a half-completed play cheque inside.

Accianco kneeled, put the cheque down, and wrote “To Mr. Manaka” with a crayon. Then, she signed her name as “Accianco”, and handed the play cheque of the value *100 cianco* to Manaka.

“I give you this, too.”

“This means . . .” Manaka gazed at the cheque Accianco gave him. “This means!”

“Yes.” The voice of Lois was trembling a little. “You understand what that means, too, don’t you?”

Lois then turned to Accianco, and asked if it was really all right for her to give the cheque to Manaka.

“Are you sure, Accianco?”

“Yes, I’m sure.”

“Umm, that one is,” Accianco’s mother appeared to be a little upset. “A play cheque A-chan made. Does it have any value?”

Lois answered, smiling.

“Enough to start a new business.”

A value is decided by possibilities and a story.

Accianco was still little, having limitless possibilities.

And the town was full of posters of Resistanco that had Accianco’s photo. The cheque on which the story of Accianco, the heroine who saved the Wonderland, was carved, meant enormous value under NEO.

Of course, even under NEO, creation of money meant creation of debt. It means that Accianco had just promised that she would make some big contribution to the society in the future.

Up until now (and probably for a long time to come), Accianco had been given allowance by the mother. That money came to Accianco’s house because Accianco’s mother worked, doing something so valuable that everyone wanted to say “Thank you” to the mother. This time, Accianco promised

that she will do something even more valuable in the future that many people will want to say “Thank you” to her.

When Lois tried to confirm that with Accianco again, she answered with a smile.

“Yes, Accianco will do something useful for the world when I grow up.”

Then, Accianco hooked her little finger to Lois’s, and they made a promise for the future.

Manaka’s Resolution

Manaka made his mind to start a toy shop with the cheque he was given by Accianco. He decided to live the rest of his life doing something for children.

Helmut also wanted to chip in with a WAT ticket.

“Wait, wait.”

Manaka stopped Helmut who was about to transmit a ticket from his small computer.

“Let me decide the unit, the meaning. Let me decide the unit, the meaning.”

For a moment, they thought about the Bank of Centricity note, but they were relieved by his next words.

“But I quit the unit *manaka*. I quit the unit *manaka*.”

Manaka wanted to propose a new currency that children can freely use for pursuing their possibilities.

“Then, why don’t you drop the last ‘ka’?”

As Lois suggested, if you drop “ka” from “manaka”, you get “mana”. Those were first two syllables of the Japanese word “manabi” that meant “study”.

Consequently, a 10 *manas* WAT ticket was issued by Helmut, and given to Manaka.

That was the moment of birth for the currency “mana” that circulated only for educational purposes, and was going to be used widely around the world hereafter. To learn new things, children were now allowed to freely issue *manas* to get services from people around them. Later, these children becoming adults would accept *manas* from the next generation to pass the knowledge on.

It was then that people of the fire group and patrol group wearing fire suits piled out from the door to the roof. It appeared that the fire of the building had been put out.

Reunion

Among the people of the fire group and patrol group, there was Accianco's uncle, also wearing a fire suit.

"Rongo!" Accianco's mother called the uncle, that is, her younger brother.

"Hi, everyone. Hello, sister. It must have been such a trouble."

Puppy-chan jumped at the uncle.

"Wow, Puppy-chan, you played an active part, too." The uncle held Puppy-chan in his arms. "I too received the Risistanco's e-mail. Everyone did very well."

The uncle was visiting near Hunan City for a vacation, and he hastened to the city as soon as he received the message of Resistanco.

"I almost forgot. When I was fishing under an overpass, this thing had fallen from the above."

In his hand that was stretched out towards Accianco was the copy of "Explorers! of the Wonderful Internet" that Accianco threw out from the window of the bus.

11.3 Return to the Community

The Secret of the Suttoko-Hole Machine

Then, the wheelchair and the braille glove of Dr. Suttokoholm were brought, which were found in the building by the fire group. Dr. Suttokoholm sat on the wheelchair, wore the braille glove on his left hand, and then operated something in the air.

Which somehow made the buildings around them move with big, roaring sounds.

"Hey, grandpa!" The uncle screamed. "What the heck have you begun this time!?"

The uncle thought that Dr. Suttokoholm started some mischief again.

"Huh?" Dr. Suttokoholm answered, remaining calm. "What have I begun? Don't you see that I've begun to prepare so that Accianco and her family can go back?"

Among those high-rise buildings that began to move, some got higher, some got lower, and with big squeaking sounds, all slowly slid horizontally. Shortly, from the viewpoint of everyone on the roof, the buildings got aligned in the form of a ring surrounding the Bank of Centricity building, keeping the same distances with neighboring ones and having the same height. In the process, some roads were cleanly separated at their joints with roundabouts, and slowly rotated to avoid the moving buildings. At the boundaries of the

separated roads, the signs for closed traffic appeared, extending themselves from under the road, making people wonder how they had been folded under the road in the first place.

Then, the heliport on the roof of each high-rise surrounding the Bank of Centricity building opened from side to side, and from inside, something looked like a laser irradiator appeared, rotating to point at everyone on the roof.

This was the Suttoko-Hole Machine. Hunan City itself was the machine!

There was more to it. The software program stored in the memory of the computer to control Dr. Suttokoholm's wheelchair unleashed itself, and copied itself through the Internet to all computers in Hunan City, multiplying. Each copy of the program contributed partially to computation necessary for making a Suttoko-Hole that connects exact two points on the Earth.

Everyone's small computer, such as Helmut's, Lois's, Nan's and Manaka's, also participated in the computation.

"Applying all electricity and computation power of the whole town, the machine concentrates energy onto one point from all angles to make a hole in the space. I've participated in the City Planning Forum for Hunan City for making this, and have secretly put some mechanisms onto the design of this city."

"I remember that buildings moved several times since last year. I've been wondering." One of the members of the fir group said.

Dr. Suttokoholm noticed that Helmut was amazed to watch the movements of the buildings, and talked to him.

"This wormhole requires huge electricity and huge computation power. So actually, it doesn't pay as means of transportation. Rather, the Mirai-Scope as an application of this technology will contribute a lot more to humanity."

"But, the Mirai-Scope cannot see anything when it peeps at near future, because of uncertainty. I don't think it will be useful for making any forecasts ..."

At that moment, something sounded really funny in Helmut's back, and a commotion was heard. When he turned around, there was a black hole. A Suttoko-Hole had been generated by all electricity and computers from the whole Hunan City.

"Now, go back to your home. And thank you."

Dr. Suttokoholm said to Accianco and her family.

Another Promise

But, Kencha could not go through the Suttoko-Hole, because it was possible that if a thing with electronic circuits go through a Suttoko-Hole, it would

break.

“Accianco, I cannot go through the Suttoko-Hole.”

“I see.”

“And, I’ve promised to work with some WAT tickets. So, I will work for a little in the Wonderland.”

It appeared that some inquiries had already been received through the Internet asking if he could translate machine languages to human languages.

“Kench, is your home the institute?”

Accianco worried if Suttokoholm Institute of Science was actually the home for Kench, because he was born there.

“No. My family members are Accianco, Puppy-chan and Accianco’s mom.” Kench smiled, and then promised. “So, I’ll go home on a plane in no time.”

Accianco nodded.

“Now, if you are ready, go. Let’s meet again.”

Prompted by Dr. Suttokoholm, Accianco, Puppy-chan and Accianco’s mother came near the Suttoko-Hole. Then, waving their hands for the people seeing them off, they jumped into the hole, and with a popping sound, instantly reappeared at the park in front of their house.

Towards the Money in the Wonderland

This is the end of the adventure story of Accianco, her family and friends over the money in the Wonderland.

But, this story has a sequel, or two.

The thief who stole money from the unattended vegetable shop in their neighborhood was caught by the police while they were in the Wonderland. The criminal was a young man who could not better his life although he worked and worked, and finally, he found himself in poverty.

He worked for a company for seven years as a temporary worker. He was confident that he worked hard as a member of the company with his colleagues, and with hope, he applied for the employment examination for the regular employees for the company. But he failed at screening by the submitted documents, without an interview. He had realized that for the company, he was not worthwhile even to hear what he had to say. The notification of failure was sent by the name of the president of the company who spoke kindly to him for a number of times, which made the shock even deeper for him. He had come to think about himself all the time, introspecting what was wrong and invaluable about himself, and for that reason, he could not put his hands on his work for about a week. That was an enough reason for the company to fire him. He began to work by the day, but he could not

repay his debt any longer, and almost unconsciously, he put his hands on the box of money at the shop.

This was not just someone else's affair. It could happen to anyone.

Therefore, Accianco's mother made a proposal to start a new economy in the region, referring to the mechanism of money in the Wonderland. It was a proposal to make a regional society in which people could live with confidence, without a need to steal money.

After the movement got on the right track, and got being talked about even outside that region, Accianco's mother was often called to give a talk. She always ended her talk with these words:

"Why don't you start a new economy of your own, in your own region? It can start as a very simple thing.

If you don't do anything, nothing will change. But, if you start something, that thing will start producing things around you.

RESISTANCO IS FERTILE

Because it is you who can change your own lives."

30 years later.

Chapter 12

After the Petroleum Civilization

The appearance of the sky has changed, and so has that of the oceans. Mr. Human, Ms. Human, where has the oil gone?

12.1 The Fruits of Time

Changes in the Sky

In the blue sky, there floated a number of white airships. The sky was quiet except for the weak sounds of motors that rotated the propellers.

As if weaving its way between the airships, a duck was flying. The duck awoke from what seemed like an eternal sleep, and flew towards the big sky as it used to a long time ago. As if recapturing its senses of bodily movements that had been long forgotten, the duck would flutter wildly to go high up in the air, and then stopped the movement of its wings to glide gracefully. Repeating this sequence of movements for several times, something appeared to be troubling the duck, and it kept looking around itself and leaning its head, wondering.

— What has happened to the sky?

The duck had been puzzled by the apparent change in the sky from what it used to know. Airplanes have gone from the sky.

It could not even see the jet fighters it used to see often, which flew at supersonic speed, roaring and cutting through the air.

— Has human stopped fighting?

The duck shook its head as if to say that it was not possible, and made its mind to fly further to continue its exploration.

Then, all of a sudden, a big, white metallic wing appeared out of clouds, and proceeded forward to the duck. A big airplane showed itself. The duck hurriedly amplified its strength to flutter, barely prevented itself from being hit, and flew over the wing of the airplane.

That was close. The duck was caught off guard, because it could only faintly hear the sounds of propellers cutting the air, rotated by the numerous motors on the big wing. The duck admitted that it was being careless, and decided to use the embedded radar in its body from then on, in addition to its eyes and ears.

To thoroughly investigate the airplane it awaited, the duck flew over and in parallel with it.

It was a propeller-driven airplane that had a small body and impropor-tionately huge wings on which photovoltaic power generation panels were spread to cover the whole part. As the duck recalled, the airships it had encountered so far also had photovoltaic power generation panels on their bodies.

These airships and airplanes would not be able to carry many people and travel fast in the air, the duck wondered. But, as it saw through the windows of their passenger cabins, the travelers appeared to have enjoyed their graceful trips in the sky.

The duck lowered its altitude.

Changes in the Oceans

On the ground, the duck could see trains and electric vehicles running. Such a tendency not to use gasoline-powered automobiles, the duck remembered, was already eminent before it went to sleep. But, there was one thing that duck overlooked, possibly because the sight was so natural; the ground apparently had more luxuriant greens.

Houses were there among greens, and the whole cityscape was in the greens. Along the seashore, numerous propellers were rotating to generate electricity.

Turning its eyes to the ocean, the duck could see a large number of sailing boats running, leaving white traces behind. There found no ships with funnels. The duck remembered that the funnels had become a mere facade by the progress of engine technologies since many years before it went to sleep. They were only meant as places for painting identification signs, but perhaps the ships had lost engines all together, or engines had been replaced by electric motors by now, and those identification signs appeared to be painted on the big sails in most cases.

The sailing boats themselves looked different from before. Many cargo ships had the form of a computer-controlled parasailing-style sail dragging the ship body.

Yet, the duck noticed, there was an old-style white sailing boat gracefully moving on the ocean. It was rather a large ship. On its broad deck, the duck could see a crowd of people.

— What are they doing?

As the duck approached, it saw that a party was ongoing, and by the side of band people wearing uniform red jackets playing the instruments, a man and woman wearing white suits and a dress, respectively, were talking with friends who came to bless.

The duck stopped on top of the mast of the ship for a while, and listened attentively to the band playing. It was a nostalgic jazz tune.

Then the duck noticed that something was moving on the sea a little far away. The duck's eyes, with a high performance optical system, zoomed into the moving object. It was what appeared to be a father and a son on a small boat, fishing. Such sights could be seen everywhere on the ocean.

— How peaceful it is. What a tranquility.

It was as if an ancient relation between the ocean and human had now come back.

And then, the duck realized that there was yet another point critically different from the oceans it had remembered; on this ocean, anywhere as far as the eyes of the duck could see, there was not a single tanker transporting oil.

Where Has Oil Gone?

The duck closed its eyes, and in its mind, put into order what it had observed so far: airships, a new breed of airplane that flies by photovoltaic power generation, sailing boats in the parasailing style. To the eyes of the duck, it seemed as if human had made such a slow and peaceful world that they did not have to use so much energy to live lively and have fun.

— Where has the oil gone?

At last, the duck had realized the length of the years it had slept.

Already, the oil was virtually no longer usable because the cost was too expensive, and it was all right for human not to use it.

The duck took off again, and after repeating to circle satisfiedly for several times, began to fly towards where it came from: Suttokoholm Institute of Science in the Wonderland.

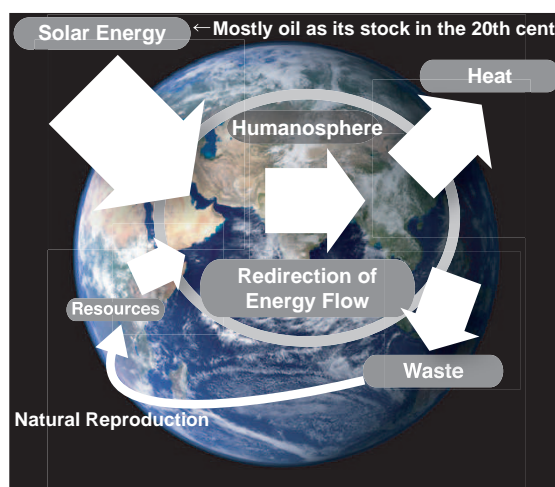


Figure 12.1: The Earth and Its Energy Flow

12.2 Learning from the Past

History of the Earth (Reprise)

Meanwhile, at Suttoko-Memorial Hall next to Suttokoholm Institute of Science, a female researcher who started *Earth-Scale Operating System Science*, which saved the world, was giving a lecture. It was a talk about how she looked back the past thirty years.

“— The key to the solution was to learn from the past. As you know, the hologram of ‘History of the Earth’, a special exhibition at Suttokoholm Institute of Science thirty years ago, was the real image of the Earth actually taken in the past. *Mirai-Scope*, a time-ward application of *Bottomless Suttoko-Hole* that is a wormhole invented by Dr. Suttokoholm, was discovered by a researcher called Ms. Mirai. Hence the name *Mirai-Scope*, but it could be misleading for those people who use Japanese. Of course, we can see not only the future, but also the past from any angles based on the same principle.

So, right after the discovery of the *Mirai-Scope*, a fixed point observation of the Earth was tried since its beginning to the present. It was from this trial that the hologram of ‘History of the Earth’ exhibition was made.”

On a large screen behind the scientist, an image of the Earth floating in the darkness appeared.

“Let’s review the system we call the Earth once again. A system has inputs and outputs. If we see the Earth based on its inputs and outputs,

then our human civilization is just a side effect.

First, let's review the inputs. Among the energy sources that the Earth can utilize, the Sun is dominant, which brings about 174PJ of energy per second to the Earth. Today, we can feel it in our daily life, as in ancient days, people who had just started a civilization must have felt. Only today, we feel the same feeling by using more advanced energy engineering.

But, just thirty years ago, we still maintained as is the shapes of civilizations and life styles under the particularly special circumstances in the history called the twentieth century. Instead of utilizing the solar energy flowing into our atmosphere right at this moment, we burnt its stocks to obtain tremendous energy.

The oil is a fossil fuel. It was generated by a long process of plants growing by receiving the solar energy, animals eating the plants, and their dead bodies being accumulated and compressed under a big pressure. Throughout the twentieth century and at the beginning of the twenty-first century, we had instantly burnt more than half of the stocks of the solar energy that the biosphere had accumulated for long, long years

By depending the energy to be used by the civilization on the stocks of solar energy accumulated in the Earth, we don't have to wait for the stocks to deplete for facing the problem; much before that, the cost of the energy is destined to increase when the balance between the energy to obtain the stocks and the energy to be obtained breaks. This is the energy problem.

Next, let's review the outputs. If the solar energy is the input of the Earth, the outputs of the terrestrial activities using such energy are heat and waste. We cannot escape from this relation because of the laws of thermodynamics.

The heat, one of the outputs of the Earth, is eventually transferred to the outer space by an infra-red radiation. The ratio of this radiation is determined by the physical conditions of the Earth's environment.

The waste, the other output of the Earth, is for example carbon dioxide from a viewpoint of human. Carbon dioxide is removed from the atmosphere at some rate to be accumulated in the sea ground by the circulation of water the Earth has, and to be fixed in the ground by the photosynthesis of the plants.

What if human used energy at an exceeding rate than those processings of the outputs? Of course, the heat and waste stay in the living environment of human. This is the true nature of the environmental problem.

We had learned by observations of the past civilizations using the Mirai-Scope the fact that declines of all civilizations were due to some energy or environmental problems. This had to be obvious, because to sustain a civilization, high inputs are needed as to maintain its activities, and low outputs need to be managed as not to stain its environment. Many civilizations had

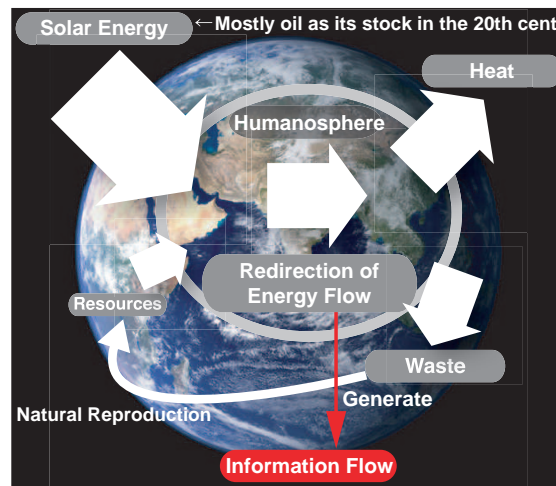


Figure 12.2: The Energy Flow Generates the Information Flow

shortened their lives by pursuing their prosperity and consuming more energy than the reproduction ability of the nature could handle.”

On the diagram of the Earth as one system, which was shown on the screen at her back, there added an item to indicate the flow of information in the civilization.

“Now, about thirty years ago, our civilization also was facing an unprecedented danger.

The real problem was not, as often talked about at the time, acceleration of global warming by the synergism of produced heat and greenhouse effect gasses. Rather, it was about the design of the information flow.

Now, let’s review the relation between the energy flow that flows in from the Sun and out of the Earth, and the information flow that flows within our civilization.

A human being is a carrier of energy. We obtain energy from foods that had received a piece of the Sun, change that into a different form while producing a bit of heat and waste, and transfer the energy to the outside world.

During this process, we can also send information by controlling transfer of the base energy, for example, by strengthening and weakening the flowing energy.

For example, right now, my voice is heard in your ears as the compression wave reaches through the air directly or via the amplification equipment of this hall. This compression wave is a sequence of thick and thin air produced by shifting the shapes of my vocal cords, tongue and mouth over the flow of

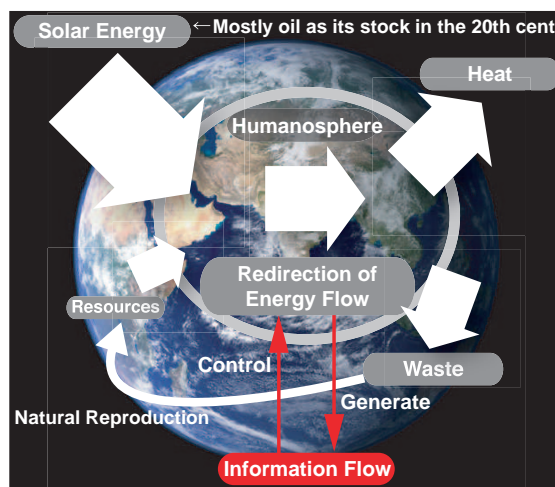


Figure 12.3: The Information Flow Controls the Energy Flow

the air pushed out from my throat.

It would be simpler to cite an example of electronic computers that are tools to externalize our brains, so to speak. We generate a flow of digital information by shifting electric energy where it's 1 if the voltage is high and 0 if the voltage is low; but the opposite would work just fine.

In these ways, we transfer information by controlling the flow of energy. In a physics point of view, the information flow is just a subordinate of the energy flow. However, we are animals that choose their activities accordingly to information, and choosing activities for us living with a civilization means none other than deciding on how we redirect the energy flow.”

On the diagram shown in the screen at her back, there added an arrow to indicate the control by the information flow over the energy flow, in addition to the arrow to indicate the generation of the information flow by the energy flow.

“That is to say, a paradoxical situation was born in which the information flow has the control over the energy flow, based on our peculiarity as an animal. This meant that how human uses energy is decided by how they design the information flow, and efficiency and effectiveness of the energy flow itself are not of human concern.

This was our favorite example: in some country, to make a box of lunch, foods were transferred 160 thousand kilometers all together burning the oil, which is four times longer than the distance around the Earth and just less than half the distance between the Earth and the Moon. Moreover, many of the lunch boxes made that way were disposed when the shops decided that

they were going to be unsold. These kind of things were ongoing under the paradoxical situation. These humongous wastes were efficient at the level of the information flow called the flow of money.”

The scientist continued, somewhat emphatically.

“Here is another example. We kept observing such a phenomenon that when the economy gets slow, the size of sweets sold for children gets reduced. Because the sweets are made for human to eat, there should be no reason for the size of sweets to get reduced unless the size of human beings gets reduced. We think, perhaps unconsciously, that standards do not change, or must not be changed. The fact that we changed the size of sweets instead of their price, I think, was a manifestation that money, instead of human body, was our standard.

Meanwhile, the financial economy, the most eminent among the information flow that human had created, was destroying the world by influencing the energy flow in a stunningly powerful way as it expanded immensely by the meaningless act of buying money with money and the mechanism of loan to borrow from the future. What money really is is debt, or in another word, a promise. It is not a physical entity so that it does not follow the laws of thermodynamics. It accumulates itself, and as there is more and more money, it becomes a bigger purchasing power, moves more materials on the Earth faster, and gives powerful influences over the energy flow. Furthermore, once it is discovered that the promise is no longer keepable, the money that seemed surely to exist disappears. It will affect seriously the activities of human as a carrier of energy. The worst part is that the physical conditions of the terrestrial environment decides the limit of the size of the energy flow that can maintain a civilization. If the size of monetary world exceeds that limit, it is then impossible that the promise will ever be kept. Such economy is destined to collapse.

Given the situation, a small number of scientists began to cry out loud. ‘If we do not redesign the information flow represented by the financial economy, terrible things will happen!’ But this appeal did not quite appeal to the hearts of people.”

The Keyword is “Sail”

“The change began almost unexpectedly.

Around that time, partly because of speculations, the price of the oil began to rise sharply. Then, even those people who kept driving automobiles with strong will despite of all warnings about environmental concerns suddenly stopped using gasoline-powered vehicles.



Figure 12.4: The Keyword is “Sail”

We could feel with reality that human can change if the input changes, that is, if conditions of how we obtain the energy.

The sense of crisis towards the Peak Oil positively worked for the transition of our civilization. We could finally make the first step towards the big transition after realizing from the bottom of our hearts that the oil will not be usable any longer. Of course, it was not a transition to nuclear energy as some people envisioned, because it was apparent that nuclear energy depended on oil with respect to mining, etc.”

A big Chinese character to denote “sail” was displayed on the screen behind her.

“Thus, the technology to receive the natural energy with planes has become the new foundation of our civilization. It was the birth of natural energy engineering, or using more familiar term for us today, *sailogy*. In this field of engineering, based on the viewpoint that the natural energy is to be utilized, a large variety of technologies have been systematized.

Photovoltaic power generation and solar thermal utilization that directly use sunlight.

Damless hydroelectric generation¹ including micro hydro, tidal power, tidal current power and wave power, which utilizes water circulation on the surface of the Earth while minimizing the effects to it.

Wind power generation, windmills and sails to receive wind as driving force. These examples utilize atmospheric circulation.

In space, too, solar sails² to drive spacecrafts forward by receiving energy of light from the Sun, and aerobraking³ to slow down spacecrafts by the friction with the atmosphere of a planet.

¹**Damless Hydro** (p.155)

²**Solar Sail** (p.155)

³**Aerobraking** (p.156)

All these instances have been systematically understood today under the name of sailogy.

The lifestyle of hoisting a sail to receive a blessing of the nature, on the Earth or otherwise, has become the basic of our lives.”

The Distributed Society

“When we change the means to obtain energy, our civilization changes, and our cultures, or our ways of lives, also change.

The oil had limited places to be extracted, and energy needed to be aggregated to transport the oil to the places in need. We also needed large facilities to burn the oil to obtain electricity.

But, the sunlight reaches our atmosphere equally. Even to shady places, the solar energy flows in indirectly in such forms as winds or water flows. If we want electricity, power generation is possible everywhere. In a society based on sailogy, sub-energy flows originated from the energy flow from the Sun can start everywhere.

As it is apparent from old Chinese saying of managing soil and water as the origin of governance, social systems such as politics and economy have had the role of coordinating the energy flow.

In ancient days, the driving force of the energy flow was on the side of the nature, and starting points of the sub-energy flows were distributed, although there must have been optimal points from which people extracted the natural energy in each region. The social systems, too, were distributed to some degree, accordingly to the energy sources.

By the so-called industrial revolution, where we learned to use fossil fuels, people obtained the driving force of their own energy flow, but its starting point was centralized. Accordingly, the social structure had to be centralized. Globalization was destined to emerge even in the eighteenth century when the industrial revolution started.

The new revolution of our civilization was not an information revolution as people would say at the time, but the energy revolution we had with sailogy. By that, while still keeping the driving force of the energy flows, human could distribute the starting points of them again. And, we needed distributed social structures in accordance with the distributed energy flows, in order to efficiently coordinate the flows.

Through this rise of decentralization in the social structure, human society finally started to move forward to designing the information flow that fits the new form; the information flow that is autonomous, distributed and matching with the energy flow.”

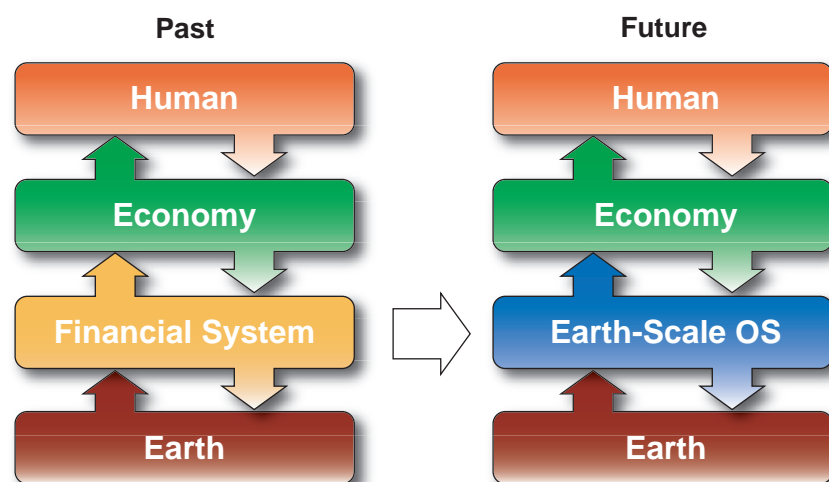


Figure 12.5: The Layer Structure of the Earth and Civilization

The Earth-Scale Operating System

“When we started redesigning the information flow in our civilization, we referred to the framework of operating systems⁴ that are basic software of computers. We thought that to tackle this difficult problem, the shortest way was to utilize the knowledge of computer science, especially in the fields of distributed systems⁵ and resource management.

An operating system of a computer aids programs that users cast to run on the computer by coordinating the requests from those programs, and accommodating various resources in the computer. The objective is not for the system to grow.

Likewise, the Earth-Scale Operating System of the Earth as one distributed computer aids people’s lives in the terrestrial environment by coordinating the requests from economic activities of people, and accommodating various resources on the Earth. The objective, again, is not for the system to grow.”

On the screen at her back, a diagram appeared to explain the relation among the Earth, human and the Earth-Scale Operating System, which was similar to that of computers, users and operating systems.

“Because the Earth is finite, the function has always been needed to coordinate between human desire and resources on the Earth.

⁴Operating System (p.156)

⁵Distributed System (p.156)

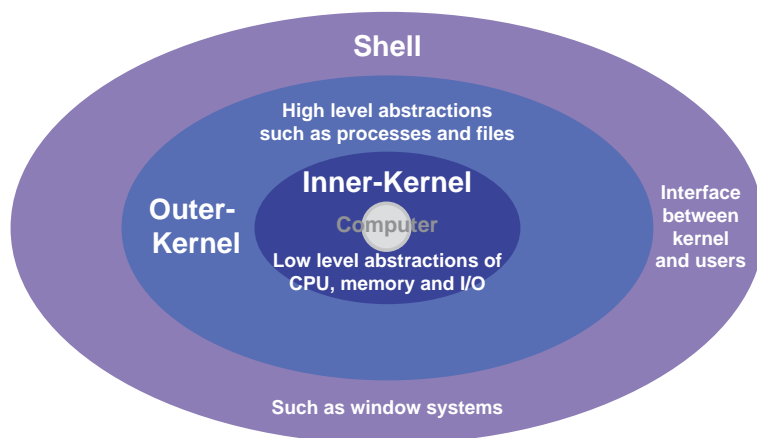


Figure 12.6: Design of Existing Operating Systems

This function used to be realized by the financial economy system; the system was designed to allow human to release one hundred percent of their desire. Under this system, the objective of economic activities is replaced by earning more money, and people were frantically indulged in the best way to earn money: having things done inexpensively. To do so, the easiest way was to exploit from where no complaints were returned if only small costs were paid; Those were the poor people, the nature, and the future children.

At any cost, it was necessary to replace this function based on financial thoughts with that based on scientific thoughts.

However, the framework of existing operating systems was useful only as a starting point for the problems of efficient resource allocations and sustainable system designs. For realizing coordinations among selfish entities that self-organize and repetitively construct and destruct themselves, switching of mind was needed. We needed to overturn the design of existing operating systems.”

The next diagram on the screen at her back explained the structure of old operating systems. The structure had the hardware resources of the computer in the middle, surrounded by the inner-kernel⁶ that abstracts such resources, which was then surrounded by the outer-kernel that provides higher abstractions such as processes and files needed for programs to run, and on the outer-most layer, there was the shell⁷ as the interface with the user.

“And that was exactly what we did. We have overturned the design of

⁶Kernel (p.157)

⁷Shell (p.158)

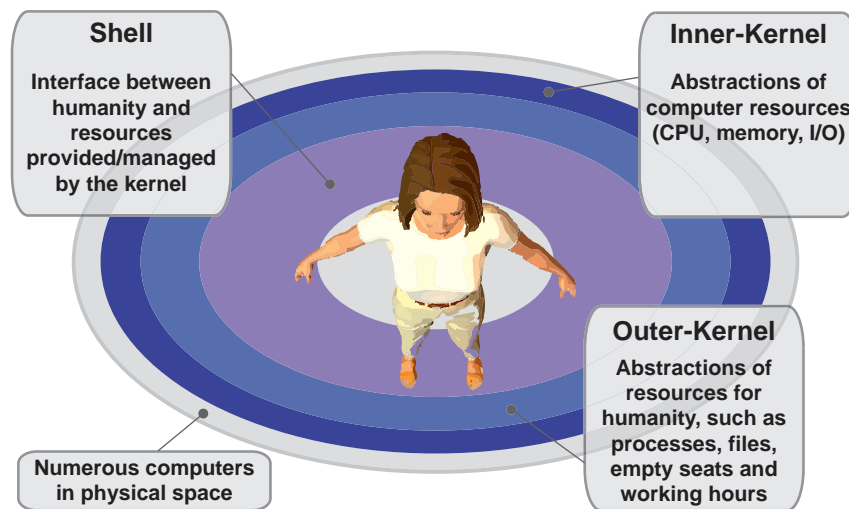


Figure 12.7: Overturning the Design of Existing Operating Systems

the operating systems. We have pulled its inside out, and placed human in the middle.”

The diagram on the screen at her back turned itself inside out, and there appeared a figure of a human being in the middle. The computer that used to be in the middle got torn apart, and its pieces found their places at the outer rim as numerous computing resources.

“Because there are many people, in actuality, this system is polycentric. There is no center that aggregates or controls the whole.

And for the whole to be maintained this way, the concept of ‘*local-production-local-consumption*’ is important. This concept, as you all know, originated in the field of agriculture, and meant the principle of purchasing agricultural products from producers in the vicinity. But this concept can be applied to any aspects of our lives. It indicates an engineering principle of ‘selecting the nearest resources among the equivalent ones’.

Accommodation of resources following the principle of local-production-local-consumption is superior in its efficiency; because nearest resources are utilized, we can save energy consumption for transportations, and resources are quickly obtained. It is also superior in stability; because the number of relays is minimized, we get less points of failure. Furthermore, it is superior in plasticity, too. Plasticity is a property of a system to measure how the system can go on if part of it is broken and its shape changes. If a region can almost hold itself only with nearest resources, then it will be more likely that activities in such a region can continue even when it is separated from

the rest of the world by some disaster.

The Earth-Scale Operating System designed in that way realizes a new information environment in which everything that can be abstracted on the network, including processors, memories, disk storages, network bandwidths, keyboards, displays, sensors and actuators, software, images, audio, documents, know-hows, vehicles and their seats, fuels, electricity, water, clothes, foods, and human beings and their talents, abilities or efforts, are captured as resources, and provided to people in need when and where they need them to be utilized efficiently.

Such an information environment enriches our lives, and at the same time, avoids unnecessary energy consumptions, and forms circulative, autonomous, distributed and cooperative local-production-local-consumption economy that is tolerant of disasters and other catastrophic events, to be the new foundation for us to live in harmony with the natural environment of the twenty-first century.”

The Circulative Society

“Of course, for this system to work properly, first thing we needed to do was to change the mechanism of money. We needed to construct a mechanism of economy in which money itself cannot be the objective, and which does not need to grow for itself to continue, because the objective of the Earth-Scale Operating System is not to grow, and any more growth on the terrestrial system meant breakage of our civilization.

The model we used for construction of the new monetary system was, of course, NEO in the Wonderland.

NEO, or New Economic Order, proved its robustness by successfully getting rid of the hedge funds that tried economic invasion to the Wonderland right after the failure of the Army of Centricity thirty years ago. As you know by experiencing it yourself or learning it in history classes, that incident caused the decline of hedge funds who were already straying in search for usable disparities under the situation of the energy crisis, which in turn caused the global breakage of the financial system, and in the end, led to the energy revolution by sailogy. It was really fortunate for us human that this change was realized as a gradual transition towards the new economy based on the energy flow, rather than sudden shift in confusion, thanks to the grass-root movement in each region to alter their ways of economy.

By building the circulative society as we know today, based on the monetary mechanism of the Wonderland and in which the Earth-Scale Operating System is in working, the world crisis has been avoided for the time being.”

12.3 To Future

A Ribbon in the Blue Vault of Heaven

Meanwhile, the duck was on its way back to Suttokoholm Institute of Science, thinking about the events that would have happened during the long years of its sleep.

It appeared that human could evade the foreseen destruction safely. That really made the duck feel at ease. Despite of all diverse difficulties that the duck could easily imagine, human had finally managed it. The duck was proud of human.

However ...

— Twenty years, or perhaps thirty years ...

Thinking of the length of those years, the duck had dimly realized that its creator would no longer be in this world.

But, there was no time for sorrow.

The next generation had already begun. Must witness their future, the duck thought.

Soon, the duck would arrive at Suttokoholm Institute of Science.

Then, the duck realized that something was floating far away, in the sky above the equator.

— What is that?

As the duck's excellent sight captured it, it was like a ribbon having a black luster, vertically straightened for a very long distance. A ribbon-like object was glittering, receiving the sunlight and the wind, and was stretched from high above in the space down to the ground. The mind of the duck analyzed what it was with its full force.

— Composition: carbon. ... It's made out of carbon nanotube! ⁸

It was a proof that the future the duck must witness had almost already arrived.

A Space Elevator

At Suttoko-Memorial Hall, the talk by the scientist continued.

“— But, the problem of poverty in the world has not been solved completely. If we intend to, we will hit the energy problem again, because the size of population who can live happily on this planet called the Earth has an upper limit.

⁸Carbon Nanotube (p.159)

It has been estimated that the upper limit of the population on the Earth, while for the humanosphere to sustain itself in accordance with the nature, is about one billion people.”

On the screen, a bar chart was shown to indicate how much one billion people was to the whole population in the world. It was apparent from the graph that many people would not be able to stay on the Earth if happiness of everyone was to be pursued.

“That is the reason why we have to build the space elevator⁹ now.”

The scientist then briefly explained the theory behind a space elevator.

You hang down a string from a satellite that goes around the Earth once every twenty-four hours, the same rate as the spinning of the Earth, or in other words, from the geostationary orbit. Because that would make the satellite drop as its center of gravity goes down, you stretch out a string upward, too. If you keep stretching the strings for both directions, then one end of the string will reach the ground in the end. Once this is done, you no longer have to burn fuels and fly rockets. Instead, you just have to climb up and down the string to go to the space and come back from there. Since tremendous tension is applied to this string by the gravity of the Earth and the centrifugal force from its own rotation, it has to be made of robust materials such as carbon nanotube.

“We will go out to the space, where we will form a new foundation of our lives. We are now confident that we can build a circulative system in space, as we could build one on the ground.”

The ribbon stretching vertically in the sky above the equator, the one the duck saw, was displayed on the screen. It was the ribbon of the space elevator under construction, in cooperation of people across the world submitting their assets and efforts using the mechanism of the aging money of the NEO in the Wonderland.

“There still are mountainous problems to solve. But, do we not have a hope today?” After asking so, the scientist slowly looked around the hall. “Yes, and the future is never dark, because things that have not happened yet can always be changed now.”

The scientist then smiled, and closing her eyes, lowered her head deeply. After a moment’s silence, a thunderous applause filled Suttoko-Memorial Hall, which did not seem to end.

The Promise was Kept

At that time, someone shouted.

⁹Space Elevator (p.159)

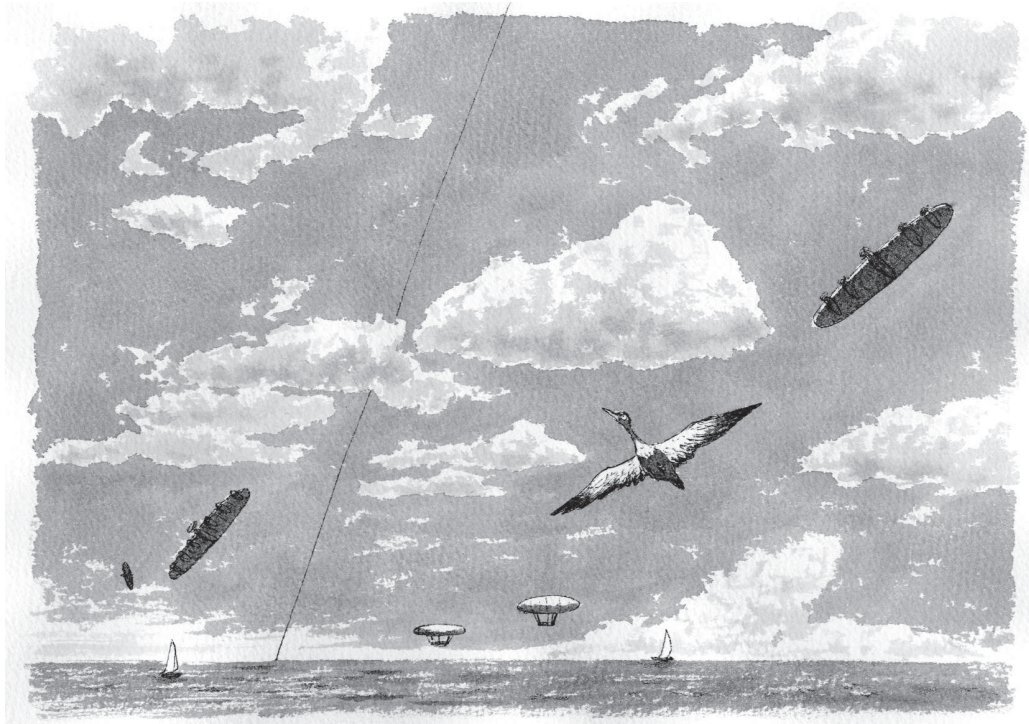
“Accianco!”

That was a cue for the crowd to roar, arousing everyone to cheer. Everyone who gathered at Suttoko-Memorial Hall stood up, and gave the scientist even bigger applause and yells.

“Accianco!”

“Accianco!”

The scientist blushed a little, being called by the nickname from her childhood.



Afterword

I hope you have enjoyed the adventures of Accianco, her family and friends, over “money in the Wonderland”.

This story was originally written as a serial story on a web site “Accianco.jp” (<http://www.accianco.jp/>) in 2004, as a sequel to Prof. Jun Murai’s “Explorers! of the Wonderful Internet” published in 2003. Those concept I introduced in the original story as advanced applications of the Internet, such as news broadcast in moving image by individuals, blogs, or palm-size small computers, are now things you can see daily. I feel as if the time has passed through the content.

But, on the other hand, concentration vs. distribution, the main theme of this story, and various problems of freedom and safety with respect to this binary opposition, or the situations of *monetary economy* being expanded beyond *real economy* (actual production, distribution and consumption) and money going berserk destroying the world, have been just brought onto a stage to be recognized as problems, and how we will be dealing with these problems is difficult to foresee. Our *Resistanco* has just begun.

The Earth-Scale Operating System, an information system to efficiently and effectively accommodate every resource on the Earth including natural resources such as solar energy, artificial resources such as vehicles, and even talents and working power of people, is my research theme today.

Actually, I hope that the Internet can take the role as the Earth-Scale Operating System. However, in reality, I regret that the Internet has not been well utilized; I feel that there are problems of the Internet calling in such thoughts resembling that of the Army of Centricity, promoting globalization by abusing its ability to connect any two points on the Earth.

In relation to this, some people have an opinion that efficient utilization of resources promoted by the Earth-Scale Operating System does not necessarily aid the happiness of people. For example, some has pointed out the problem of line-hauler drivers’ deaths from overwork: a driver transported the load to a far away place and was thinking that he or she could take a rest now. But, because it would be a waste of energy if an empty track runs on

the returning trip, the company searches for a load, and hastens the driver to transport it on the way back. The driver was made to work without taking rest.

But, if such is the case, the real problem is that someone is forcing the driver to overwork in order to make money. If the driver takes the rest for one night, and then transports the load on his or her way back, it would save fuels and also be reasonable for the well beings of the driver.

There are some things we can tell those people living deeply in the reality in which money is the only standard. We can tell them that it is not a necessary way of life, that we should not work or make other people work for making money, but help one another to live happily under the condition given by the nature called our bodies, and that the Internet can be used wisely for those purposes. I think that such a telling is *Resistanco* for us.

For this, the *Mirai-Scope* can also be used wisely. You may be thinking that no *Mirai-Scope* exists in this world. But, it is a symbol of our scientific mind that tries to read the history of the Earth and universe correctly, and to foresee the uncertain future.

By the way, the 133 milliseconds demonstration in the story was an event that took place in the *Wonderland*. Then, why could the signal of light go around the Earth?

That is because the *Wonderland* does not have a border.

The readers would have realized that the *Wonderland* is a metaphor of the Internet. Just like the Internet does not have a border, the *Wonderland* indeed does not have a border. What happened in the *Wonderland* in this story are what are happening on the Internet, and are indeed happening throughout the world.

I would like to thank everyone in *TaroJiro-sha Editas* including Ms. Kitayama and Mr. Suda who put much efforts in publishing this story, Mr. Yamamura who painted splendid illustrations for inside and the cover, Mr. Usui who showed his creativity in design of the book, everyone in *Gesell Research Society Japan* including Mr. Morino, the inventor of the *WAT System* himself, who gave me many hints through a series of discussions, my friends in *Keio University*, and my wife *Atsuko* who gave birth to the wonderful characters of the trio. And last but not least, I would like to express my gratitude to *you*, who have read this story and participated in the demonstration of 133 milliseconds.

I have dedicated this story to *Panse Saito* and his generation, in the hope that we will be able to return the Earth to them in a beautiful shape, which we have been borrowing from them, children of the future.

WAR IS OVER!

IF YOU WANT IT

Yoko Ono and John Lennon, 1969

The war-like economy is over right at this moment, if only we want it.

December 8, 2008

Kenji Saito

Afterword for the English Version

This English version licensed under *Creative Commons – Attribution-Share Alike* would not have been produced if it were not for Ms. Kitayama and TaroJiro-Sha Editas who gave me a ready consent that the translated text of their publication can go public as a free document. I also thank Mr. Yamamura and Mr. Usui for kindly agreeing to allowing this PDF document to include their creations.

<<Thanking to volunteers who sent patches comes here.>>

Appendix A

Commentary by the Author

–Prologue: The Adventure One Year Ago–

Roundabout (p.3)

Reference: R.A. Retting, B.N. Persaud, P.E. Garder and D. Lord, “Crash and injury reduction following installation of roundabouts in the United States,” American Journal of Public Health, Vol.91, No.4, April 2001.

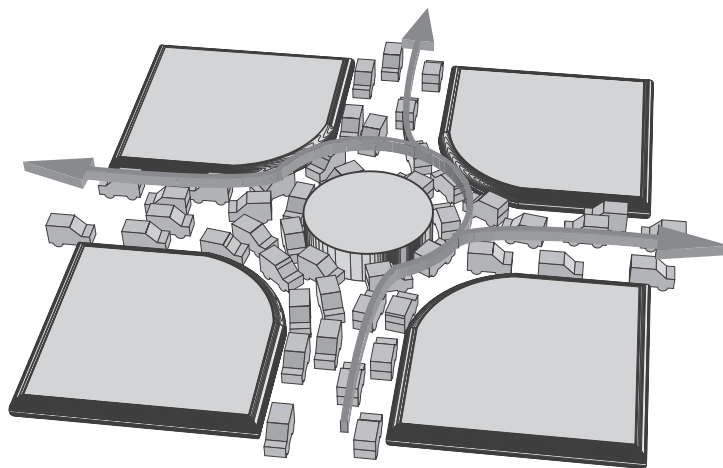


Figure A.1: Roundabout (Keeping to the Right)

A roundabout is, as illustrated in FigureA.1, an intersection in which vehicles go round and round avoiding the obstacle in the middle, and leave to the directions of their choices.

In these intersections, drivers slow down their vehicles based on their own judgments, as a result of which the flow of vehicles as a whole is controlled. If drivers ignore the obstacle, they will collide to be injured or dead. If they fall asleep or just lose focus, accidents are also inevitable. Therefore, the drivers have to be careful if they like it or not. At a roundabout, safety is not something provided by others.

According to the article in the reference, the number of severe accidents were reduced 38% after converting intersections with traffic signals and stop signs to roundabouts.

In the story, the damages by the crash accident caused by Hiromi's driving were comparatively small. That may have been because all surrounding vehicles were slowed down.

By the way, roundabout is a term used in the United Kingdom. I stayed there for a short while from 1994 to 1995, and enjoyed going through a big roundabout everyday when commuting.

RFID Tag (p.4)

Reference: RFID - Wikipedia.

<http://ja.wikipedia.org/wiki/RFID>

An RFID tag is used for identifying an object in **R**adio **F**requency **I**Dentification. A tag has a unique number, reading which via wireless communication the object with the tag is identified. RFID is expected to replace barcode for identifying commodities. Public transportation cards already in services such as Suica by JR East, Japan, are applications of RFID in a broad sense.

RFID is different from barcode in that remote objects can be identified to some extent because it uses radio waves, and individual commodity as well as the name of the commodity can be identified.

Cryptography (p.4)

Reference:

- (1) Jun Murai. Explorers! of the Wonderful Internet. TaroJiro-Sha Editas, 2003 (in Japanese)
- (2) Cryptography - Wikipedia, the free encyclopedia.
<http://en.wikipedia.org/wiki/Cryptography>

The basic mechanism of cryptography broadly used on the Internet today is explained extensively in *Chapter 7 Wonders of Security* of Reference (1) (pp.118-137), which precedes this story. It is called public key cryptography, which I will briefly review here.

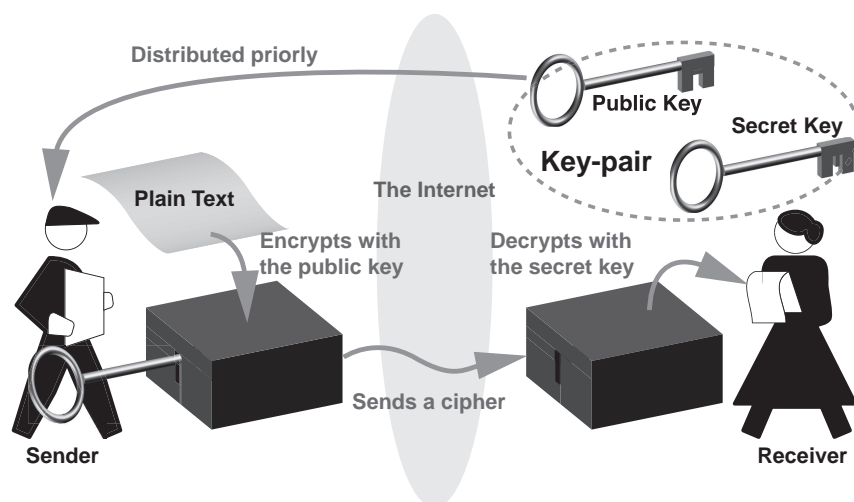


Figure A.2: Encryption/Decryption with Public Key Cryptography

As illustrated in FigureA.2, those who want to receive encrypted text prepare their own key pairs. A key pair consists of the public key and the secret key. The secret key is kept secretly by the owner of the key pair, and the public key is distributed priorly among people who may want to send encrypted text to that person.

A sender of an encrypted text uses the receiver's public key to encrypt the original text. Because the cipher can only be decrypted by the secret key corresponding to the public key, a secret communication is possible in which the text is made confidential to the owner of the secret key.

Those readers who would like to know more detail about cryptography in general may want to read Reference (2).

If you really want to make sure that encrypted communication is secret between you and the correspondent, a big problem is how you verify that the public key of the correspondent is genuine. It is possible that the key is replaced by another when it goes through the Internet.

When you go shopping on the Internet, cryptographic communication is performed so that your private information such as credit card numbers are kept secret. But in such a mechanism, the authenticity of the public key of the shop is certified by the efforts of someone in the middle. That is something

different from the way of thinking in the Wonderland, and therefore, in the story, I have introduced another way to do it using the webs of trust.

–Chapter 2 A Rainbow Tunnel–

Giant Impact (p.14)

Reference: Giant impact hypothesis - Wikipedia, the free encyclopedia.
http://en.wikipedia.org/wiki/Giant_impact_hypothesis

How was our Moon made? The most plausible hypothesis today is that a heavenly body the size of Mars collided the ancient Earth, and the debris from the collision gathered to form the Moon. This is called *Giant impact hypothesis*.

As explained in the following section, this story needed to review an outline of the history of the Earth. When talking about the Earth in its beginning, the birth of the Moon is something you cannot just ignore.

History of the Earth (p.15)

Reference: Takafumi Matsui. Space Person's Way of Life – Introduction to Astrobiology –. Iwanami-Shinsho, 2003 (in Japanese)

I consulted the reference by Prof. Matsui of Tokyo University about the beginnings of the Earth, the biosphere and the humanosphere that are described in the story.

In the book, I found the following passage impressive:

“... It is suicidal for the humanosphere to consider the twenty-first century based on the ways of thinking, senses of values, concepts and systems of the twentieth century. Simply put, we are destined to fail if we think about the twenty-first century based on the concepts and systems that have been established in the framework of the twentieth century, such as democracy, market economy, human right, love, god, and money.”

I thought that these things could be said with dignity only by the physicist who have continued to look steadily with his scientific mind at the Earth as one system, its beginning and the future. I also thought it was indispensable to refer to the history of the Earth in order to clearly describe the problems that humanity has to face and their causes.

Energy Budget of the Earth (p.17)

Reference: Earth's energy budget - Wikipedia, the free encyclopedia.
http://en.wikipedia.org/wiki/Earth%27s_energy_budget

Imagine that you have an apple on your palm while standing on the Earth. Suppose that the weight of the apple is about 102 grams. Then, the force of the apple pushing down your palm is called 1N (newton; or $kg \cdot m/s^2$). If you push up the apple 1 meter above, the energy to do so is called 1J (joule). If you do it in one second, the power consumed is called 1W (watt).

The total amount of energy entering the Earth's atmosphere is estimated at the rate of 174PW (petawatts), where P (peta) means $1,000 \times 1,000 \times 1,000 \times 1,000 \times 1,000$. Solar light amounts 99.978% of it. The ground heat is at the rate of about 23TW (terawatts), where T (tera) means $\frac{1}{1,000}$ of P (peta), which amounts just 0.013% of the total energy.

—Chapter 3 A Night in the Wonderland—

Digital Signature (p.26)

Reference: Digital signature - Wikipedia, the free encyclopedia.
http://en.wikipedia.org/wiki/Digital_signature

By applying digital signature to data such as a document, the following can be guaranteed:

1. The person on the signature has signed the document.
2. The document has not been modified since the signature.

There introduced a variety of applications of digital signatures in the story. The mechanism is better described in the book preceding this story as in the case of **cryptography** (p.140), but let me review it briefly here.

As FigureA.3 illustrates, a person who wants to send a digitally signed text calculates the hash value of the text, and encrypts the value with his or her secret key. The result is the signature, which the person sends with the text.

The receiver calculates the hash value of the received text, and sees if it matches the hash value decrypted from the signature using the sender's public key. If it matches, the receiver can be sure that the person who has the corresponding secret key to the public key has signed the text, and the text has not been modified since.

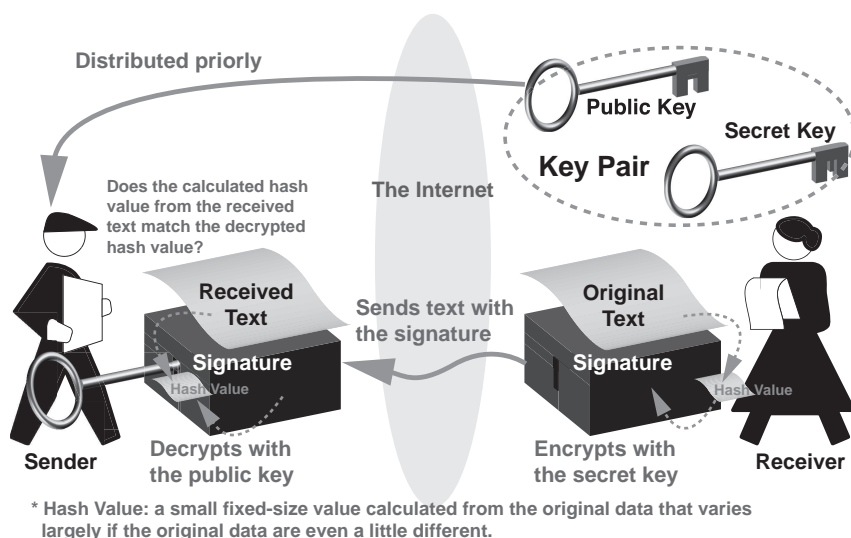


Figure A.3: Digital Signature

—Chapter 4 A Mysterious Bank—

The WAT System (p.32)

Reference: Rui Izumi. The WAT-System.

<http://www.watsystems.net/watsystems-translation/english.html>

The WAT System is a mechanism of a **local currency** (p.150) developed by Mr. Eiichi Morino, the chair of the Gesell Research Society Japan, which has been used in reality in many regions including Shiki City, Saitama prefecture, Chita peninsula and a farm in Yamato City, Kanagawa prefecture, Japan. It was also used in Yufuin, Oita prefecture, but the currency is not so much circulated today as its role of community building has been satisfied.

A WAT ticket, the medium of the WAT System, can be designed by anyone to meet their own needs. On a standard WAT ticket, it is written that “WAT members wish that the nature and human as a nature will be the standard.”

i-WAT (p.32)

Reference: i-WAT. <http://www.media-art-online.org/iwat/>

i-WAT is an electronized version of the WAT System I developed so that it can be used on the Internet.

In fact, you can download the software for personal computers by following the links you will find in the URL in the reference. You will have to have **PGP (GnuPG)** (p.153) installed because digital signatures are needed for endorsements and so on.

It is a software still in progress, and many features are planned to be added including supports for mobile phones. I would be really grateful if you could try the software, and give me some feedback.

i-WAT is a free software¹, distributed under GNU GPL (General Public License).

Now that I mentioned it, I will have to explain about GNU and free software.

Free Software (p.145)

Reference: The GNU Operating System. <http://www.gnu.org/>

GNU (**GNU's Not UNIX**; pronounced with the first G) is a project to implement the whole software environment that is compatible with UNIX **operating system** (p.156) as free software.

A free software does not simply mean that it is provided free of charge, but it is a software that guarantees all four essential freedoms as follows (quoted from the reference):

- The freedom to run the program, for any purpose (freedom 0).
- The freedom to study how the program works, and change it to make it do what you wish (freedom 1). Access to the source code is a precondition for this.
- The freedom to redistribute copies so you can help your neighbor (freedom 2).
- The freedom to improve the program, and release your improvements (and modified versions in general) to the public, so that the whole community benefits (freedom 3). Access to the source code is a precondition for this.

The number starts from 0 because it is a manner in computer science. A source code is a program written in a programming language that human beings can read and write.

¹**Free Software** (p.145)

These four essential freedoms are very important for making a sustainable information society. If we have access to the source code, even when the developers or the vendors are gone, we can continue to improve the software if the software is truly needed.

This way of thinking matches very well with the Wonderland.

Prof. Binswanger (p.39)

Reference: Atsunori Kawamura, Group Gendai. Ende's Last Message – “Questioning Money from Its Root”. NHK Publishing, 2000

The episode of a fishing village that Lois tells in the story is based on the real story quoted by Ende himself in the reference.

Prof. Binswanger is a Swiss economist.

REN (p.40)

Reference: Yuko Tanaka. What is REN? (in Japanese)
<http://www.lian.com/TANAKA/>

Lian (or REN) is a group for cultural activities formed for a variety of objectives in Edo era, Japan. It is a system from which we can learn how we could collaborate using the Internet.

Prof. Tanaka of Housei University explained REN in the reference in the following way:

“Chinese character *lian* in Japanese is pronounced REN, and means a forum. ... It is made for a variety of reasons, but in Edo era in Japan (1603~1867), it was made for people to indulge in development of software [works of art], research or translation for the most part.

... Characteristics of RENs in Edo era included that they never got oversized (therefore the number of RENs tended to increase), they did not aim to continue their existences, they had coordinators but no strong leaders, the costs of operations were distributed proportionally to the economic strength of each participant, all members were creators without distinguishing patrons and artists or consumers and producers, a variety of ages, classes and professions were intermingled, members could freely join and leave, RENs were closely connected one another, and each member was

polyonymous. A creative person who participated in RENs usually used multiple (sometimes, tens of) names according to their activities.”

–Chapter 5 The Ambition of the Army of Centricity–

Fair Use (p.49)

Reference: Fair use - Wikipedia, the free encyclopedia.
http://en.wikipedia.org/wiki/Fair_use

Fair use represents a limited case in which a copyrighted material can be used without requiring permission of the copyright holders because the use is fair.

In Japan, fair use is not clearly defined in the law to specify the cases in principle, and the description remains to be enumeration of instances. As this would lead to loss of users’ benefits, as of year 2009, some political movements are witnessed towards defining the Japanese version of fair use concept.

Wormhole (p.54)

Reference: Wormhole - Wikipedia, the free encyclopedia.
<http://en.wikipedia.org/wiki/Wormhole>

A wormhole in physics is a tunnel that connects a point in spacetime with another in distance, going through which one can travel faster than light. It is also called an Einstein-Rosen Bridge because it was discovered by Einstein and Rosen as a consequence of general relativity.

This is a familiar concept for any Sci-Fi lovers, but a wormhole is a completely fictitious existence today.

The Tragedy of the Commons (p.56)

Reference: Garrett Hardin. The tragedy of the commons. *Science*, Vol. 162, 1968

The tragedy of the commons is a thought-provoking thought experiment about sharing resources in a **distributed system** (p.156), published in *Science*. The detail is as Manaka explained through the mouth of the henchman in the story.

A Thought on Patents (p.57)

Reference: Lawrence Lessig. The Future of Ideas: The Fate of the Commons in a Connected World. Random House, 2001

I followed the reference in introducing Jefferson's thought on patents in the story.

MOMO (p.57)

Reference:

- (1) Michael Ende. MOMO (English translation). DoubleDay, 1974.
- (2) Werner Onken. Eiichi Miyasaka (translator). Introduction to "MOMO" for economists (in Japanese). Free Economics Research vol.14.
http://www.grsj.org/book/sfe/keizaigakusha_notameno_momo_nyumon.pdf
- (3) Robert Mittelstaedt. Michael Ende's Last Words to the Japanese.
http://www.themoneysyndrome.org/wp-content/uploads/2009/04/kinen_shu-en.pdf

Economist Werner Onken read "MOMO" (Reference (1)), a children's story by Michael Ende, and realized that the critical mind on the monetary mechanism today and understanding of *aging money* as proposed in "The Natural Economic Order" were hidden in the story. Prof. Onken wrote about it in his paper "*MOMO* for Economists", and sent a letter to Ende to directly ask whether his interpretation was correct or not. To which Ende answered as follows (quoted from Reference (3)):

"By the way, you are the first one to realize that the idea of aging money dwells in the background of my book MOMO.

During the last years I had been deeply involved with precisely these thoughts of Steiner and Gesell since I have come to the conviction, that the whole of our cultural question cannot be solved without solving the money problem at the same time or even before."

Prof. Onken has indicated that the grey men in "MOMO" are mere beneficiaries of the unjust monetary system today, who deprive us of our time of lives by breathing on interest.

—Chapter 6 The Mirai-Scope—

Peak Oil (p.63)

Reference:

- (1) Hidekazu Aoki. Money Collapses. Shueisha-Shinsho, 2008
- (2) What carving of ‘N’ means | N! –Let’s talk about the Peak Oil era– (in Japanese).
<http://www.janjanblog.jp/user/stopglobalwarming/forum2/3252.html>
- (3) Richard Heinberg. Temporary Recession or the End of Growth?
<http://www.energybulletin.net/node/49798>

The Peak Oil is the point of time at which the growth of the world’s oil production reaches its peak, and starts to decline thereafter. The point will inevitably come, because the oil is a natural resource that is not reproduced in the scale of our life time. A variety of forecasts have been announced as to when that point will actually come, but, considering that the oil price can now rise sharply at any time by speculation, it should not be wrong to say that we are living in the Peak Oil era in a macroscopic viewpoint of history.

It is difficult to detect or foresee the actual arrival of the Peak Oil, because, I think, there are people who anticipate to gain benefits by controlling information. The Mirai-Scope, a symbol of our scientific mind, is obscured in the presence of the monetary mechanism today.

Somehow, the concept of the Peak Oil is not well known in Japan, and I myself did not think of it until I read Reference (1). I also referred to this book by Mr. Aoki when I made the diagram of the Earth as one system, which the scientist draws in the end of the story.

The explanation using the Japanese letter ‘N’ for ‘Ngamo’ was inspired by Reference (2).

Virtual Water (p.65)

Reference:

- (1) Conbini-Bento-Tanteidan. Convenience Store Bento’s 160,000 km Trip – Foods Change the World. TaroJiro-Sha Editas, 2005
- (2) Virtual water - Wikipedia, the free encyclopedia.
http://en.wikipedia.org/wiki/Virtual_water

We import agricultural products from foreign countries. If we produced those foods in our own countries, how much water did we need? The water was not used in our own countries, but behind the foods we import, there consumed such amount of water elsewhere; it is *virtual water* for us (Reference (2)).

If we see agricultural and industrial products imported to Japan in one year from the viewpoint of virtual water, it amounts to 64 billion tons of water imported from all over the world. On the other hand, the actual water used in Japan in one year amounts to 87 billion tons. Japanese people are importing more than 40% of their necessary water from the rest of the world.

–Chapter 7 NEO in the Wonderland–

Local Currency (p.71)

Reference: Ithaca HOURS Online. <http://www.ithacahours.com/>

A *local currency* is circulated only in some region. It is said that a local currency is beneficial to a region because it efficiently utilizes the manpower of the region as money circulates only within the area, enriching the lives of people there.

The currency called *Hunan Hours* in the story was modeled after an existing local currency called *Ithaca HOURS* used in Ithaca, New York, USA and its vicinity. On an Ithaca HOURS note, the motto “IN ITHACA WE TRUST” is printed. Mr. Paul Glover, the originator of Ithaca HOURS, explained the reason why they issued money circulated only regionally as follows.

“... We printed our own money because we watched Federal dollars come to town, shake a few hands, then leave to buy rainforest lumber and to fight wars. Ithaca HOURS, by contrast, stay in our region to help us hire each other. ... We regard Ithaca HOURS as real money, backed by real people, real time, real skills and tools. Dollars, by contrast, are funny money, backed no longer by gold or silver but by less than nothing: \$4.8 trillion of national debt.”

In Japan, *Peanuts* in Chiba is well known as a successful case of a local currency, beside the WAT System I have already explained. Peanuts is based on a principle of LETS (Local Exchange Trading System) that is similar to exchanges between bank accounts.

The Natural Economic Order (p.71)

Reference:

- (1) Sylvio Gesell. *The Natural Economic Order*.
The Free Economy Publishing Co., 1934 (based on the 6th German Edition).
- (1') Sylvio Gesell. *The Natural Economic Order*.
<http://www.appropriate-economics.org/ebooks/neo/neo.htm>
- (2) Sylvio Gesell. *The Natural Economic Order* (Japanese translation).
<http://www3.plala.or.jp/mig/gesell/nwo-jp.html>
- (3) Gesell Research Society Japan. <http://www.grsj.org/>

NEO, also included in the title of the story, was named after the popular acronym of the English title “The Natural Economic Order” (Reference (1) and (1')) of Sylvio Gesell’s masterpiece “Die Natürliche Wirtschaftsordnung”. Its Japanese version is available as Reference (2).

In this book, Gesell said that money, too, like the commodities it can be exchanged with, needs to age (reduce values).

To realize this idea, Gesell adopted the mechanism of a *stamp scrip*. A stamp scrip is only circulated under such condition that the prospective user pays to put a stamp on its back, for example, every Wednesday. Keeping this scrip means one needs to pay the cost of stamps, and so the value of the scrip decreases as the person continues to hold it. Conversely, if the one does not want to pay the cost, he or she can use it right away. Therefore this scrip is unlikely to be saved up, and continues to satisfy the role as a medium of exchange.

Suppose that the printed amount of the scrip is one dollar, it has a space for 52 stamps on the back, and one stamp costs two cents. Then, the issuer of the scrip, such as a local government, can collect one dollar and four cents per scrip from the users, taking one year. By this, the value of the scrip can be backed up, and also the issuer can pay the expenses to maintain the system including the printing cost of the stamps.

The stamp scrips were experimented in many regions in North America and Europe during 1920-30s, when the world was suffering from the Great Depression. The most famous example took place in Wörgl, Austria, in 1932. The trial was very successful, and while the rest of the world suffered, Wörgl prospered, and attracted an international attention.

However, this trial was ended after just one year because of a lawsuit by the central bank of Austria, and thus the town at one time almost achieved

full employment had to suffer near 30% unemployment again. That was the similar situation in any regions where the stamp scrip was tried.

Incidentally, the Second World War started later, in 1939. I wonder how the history could have changed if the stamp scrip experiments were not stopped by the central banks.

Convertible Notes (p.72)

Reference: Banknote - Wikipedia, the free encyclopedia.

<http://en.wikipedia.org/wiki/Banknote>

Notes that can be exchanged with standard money (historically, gold or silver) is called *convertible notes*.

In the Wonderland, since the nature and human as a nature are the standards, the WAT tickets backed up by those are regarded as the standard money. Notes that can be exchanged with WAT tickets, such as Hunan HOURS, are convertible notes in the country.

Aging WAT Tickets (p.75)

There are several methods to realize aging money. For the mechanism of a stamp scrip, please refer to the explanation of **The Natural Economic Order** (p.151). One of other methods is called *calendar money*. In this method, schedule of the reduction of the value is printed on the money itself.

To put Gesell's thought into practice, Mr. Morino and I thought that we needed to adopt a mechanism of aging money into the WAT System, and embedded the mechanism of the calendar money into *i*-WAT as one of standard features. This means that anyone can start using aging money without delay.

I think that by using aging money, people's way of thinking about investment will change. Today, we would invest on things that we think will make a big money in the future, because money, unlike other commodities, does not deteriorate, and people would want to invest on things that will last long and continue to benefit their lives. However, if money deteriorates like other things, then we would dare not invest on money, and would want to invest on things that would last longer.

For example, you may want to invest on *yourself*, learning new skills and ways of thinking, because for you, the existence that would last longest is no other than *you*. Also, you would want to invest on things that will continue to benefit your children, your further descendants, and people in the future in general.

Mobile Clubbing (p.79)

Reference: Mobile Clubbing - Wikipedia, the free encyclopedia.
http://en.wikipedia.org/wiki/Mobile_Clubbing

A mobile clubbing is an event in a public space, in which numerous participants, each listening to his or her choice of music on headphones, suddenly start dancing. It is an example of **flash mob** (p.153). At the same time, I think that it is a way to enjoy music that fits well with the ways of thinking in the Wonderland, because it abolishes a DJ who may possibly be an authority in the club space, and instead, people enjoy dancing autonomously with their own selections of music. In mobile clubbing, music is not something provided by others.

It is no doubt that DJ Fellini, a musician in the Wonderland, has been fascinated by mobile clubbing.

Flash Mob (p.79)

Reference: Flash mob - Wikipedia, the free encyclopedia.
http://en.wikipedia.org/wiki/Flash_mob

A flash mob is an event in which a large number of people coordinated using the Internet gather in a public space, perform some specific action (for example, a meaningless applause for fifteen seconds), and disperse at the next moment. The mob of Resistanco transmitted the signal of light by flashlights performed a flash mob literally.

—Chapter 9 The Birth of Resistanco—

PGP (GnuPG) (p.93)

Reference: GNU Privacy Guard - Wikipedia, the free encyclopedia.
http://en.wikipedia.org/wiki/GNU_Privacy_Guard

PGP stands for Pretty Good Privacy, and is one of standards that we can actually use for encryption and digital signature. Public key cryptography is used in PGP (please refer to **cryptography** (p.140)).

As I mentioned before, when we actually try to use public key cryptography, the authenticity of published public keys are always problematic. Even though public keys are meant to be published, if published keys were replaced by someone, there would be no trust. What is important in PGP is

that validity of the public keys is to be verified by the network of trust that users of PGP themselves build up. In PGP, trust is not something provided by others.

GnuPG (GNU Privacy Guard) is a GNU version of PGP, and is a free software.

—Chapter 10 The 133 msec Resistance—

Gift Economy (p.99)

Reference: Bruce Sterling. *Maneki Neko*, in “A Good Old-Fashioned Future”. Spectra, 1999.

“Maneki Neko”, a short story by Bruce Sterling, is about a society alternatively supported by a gift economy that is autonomously controlled by computer networks. It looks like a form of the Earth-Scale Operating System, only gone too far, but the society is interesting. A character in this short story who participates in the gift economy is accused by a government agent that the gift economy is weakening the regulation economy that is legal and admitted by the government. His counterattack against this accusation is beautiful.

P2P (peer-to-peer) (p.102)

Reference:

- (1) Peer-to-peer - Wikipedia, the free encyclopedia.
<http://en.wikipedia.org/wiki/Peer-to-peer>
- (2) DAS-P2P (International Workshop on Dependable and Sustainable Peer-to-Peer Systems). <http://das-p2p.wide.ad.jp/>

P2P (peer-to-peer) is a way of making a computer network. In designing a P2P system, it is avoided to concentrate authorities to specific participants. Instead of having specific servers provide services, the designers pursue that all things are performed by communications among peers. By this, distribution of authorities is achieved, and as Kencha said in the story, we can avoid to have a single point of failure, or the weak point that could break the whole when it breaks, in the system. Moreover, autonomy is maintained so that everyone can start, maintain or recover from failures of such a system.

This is an important concept in the design of information structure for us to achieve a sustainable society.

In Japan, many people may still have a negative impression against P2P; for one reason, the author of a popular file sharing software called *Winny* was arrested for aiding a copyright infringement (later, the high court judged that he was not guilty, but the case has been appealed to the supreme court). Also, many would think that P2P means file sharing.

However, in actuality, in areas that are foundations of a society such as medicine, transportation, energy and so on, researches have been put forward around the world to apply the autonomous, distributed, and cooperative characteristics of P2P to build mechanisms that are robust and efficiently accommodating resources by sharing information among peers.

The information systems in the Wonderland are all based on the concept of P2P.

To promote these ideas, and to discuss problems for technologically supporting the society built based on these ideas, my friends and I have been organizing a series of international workshops (Reference (2)).

Hedge Fund (p.104)

Reference: Hedge fund - Wikipedia, the free encyclopedia.

http://en.wikipedia.org/wiki/Hedge_fund

A hedge fund is a kind of private investment union, which generally aims to earn a high yield on investment in a short time, and speculates while hedging the high risk.

—Chapter 12 After the Petroleum Civilization—

Damless Hydro (p.125)

Reference: Low head hydro power - Wikipedia, the free encyclopedia.

http://en.wikipedia.org/wiki/Damless_hydro

Damless hydro uses river current and tidal flows to generate electricity, without needing a dam. It is considered to be superior to the method using dams in many aspects including safety (because of no dam break), effects to environments and set up costs.

Solar Sail (p.125)

Reference: Solar sail - Wikipedia, the free encyclopedia.

http://en.wikipedia.org/wiki/Solar_sail

A solar sail is a form of propulsion in which lights or ions from a star are reflected on a sail that looks like a huge mirror, reaction of which propels a spacecraft.

In Japan, the Japan Aerospace Exploration Agency (JAXA) has been progressing on the research of this propulsion method, and an experimental interplanetary spacecraft called IKAROS (Interplanetary Kite-craft Accelerated by Radiation Of the Sun) is being developed.

Aerobraking (p.125)

Reference: Aerobraking - Wikipedia, the free encyclopedia.

<http://en.wikipedia.org/wiki/Aerobraking>

Aerobraking is a form of controlling the flight of a spacecraft. Instead of braking with the reverse thrust of a rocket engine, in this method, a spacecraft is decelerated by the friction with the atmosphere of a planet or satellite. By this, precious fuels can be saved.

In film “2010”, aerobraking a spacecraft by the friction with the atmosphere of Jupiter is dynamically depicted.

Operating System (p.127)

Reference: Operating system - Wikipedia, the free encyclopedia.

http://en.wikipedia.org/wiki/Operating_system

An operating system is a basic software for constructing a computer software system. It takes charge of the interface between hardware resources of a computer, such as processor or memory, and application programs. It has a role of coordinating activities of multiple programs, allowing them to share limited resources of a computer. The part of an operating system that takes charge of this particular function is called the *kernel*.

Operating systems for computers that are used by human users, such as personal computers or mobile phones (mobile phones *are* computers!), provide operational interface for human users so that they can use the resources managed by the kernel through the programs they run. This interface is called the *shell*.

Distributed System (p.127)

Reference: Paul Baran. ON DISTRIBUTED COMMUNICATIONS: I. INTRODUCTION TO DISTRIBUTED COMMUNICATIONS NET-

WORKS. 1964

http://www.rand.org/pubs/research_memoranda/RM3420/

A distributed system, in a narrow sense, is a system consisting of multiple computers connected via some network that cooperate with one another to achieve a single goal.

In a broader sense, because it is the antonym of a centralized system, it can be applied to concepts such as how a society should be.

The reference is a research memo from 1960s, but some pioneering ideas were described there with respect to realization of the Internet. In its beginning, the memo categorizes networks into three forms:

(A) CENTRALIZED

Corresponding to centralization in a society or computing system dependent on specific servers.

(B) DECENTRALIZED

Corresponding to decentralization of authority in regional systems or the Domain Name System for the Internet.

(C) DISTRIBUTED

Corresponding to the social structure of the Wonderland or P2P systems today.

The memo says that for building a really unbreakable, sustainable network, the distributed design needs to be adopted. The memo further proposes a concept known as packet communication today, in order to actually building a network based on the design principle.

This is thought-provoking for designing a society, too, because a network, after all, is a set of connections of people.

In “Explorers! of the Wonderful Internet”, the book preceding this story, we tried to explain the characteristics of the Internet as a distributed system.

In this story, I tried to depict the Wonderland as a society where the concept of distributed systems has prevailed.

Kernel (p.128)

Reference: Kernel (computing) - Wikipedia, the free encyclopedia.

[http://en.wikipedia.org/wiki/Kernel_\(computer_science\)](http://en.wikipedia.org/wiki/Kernel_(computer_science))

As mentioned in the explanation of **operating systems** (p.156), The core element of a system that makes a variety of resources of a computer available to programs has traditionally been called the kernel.

In the story, the scientist divided the kernel into two components: the inner-kernel, the part directly manages hardware resources, and the outer-kernel, the part manages highly abstracted resources such as files instead of recording sectors of a disk drive. This categorization was borrowed from BTRON (Business TRON) operating system developed in the TRON Project led by Prof. Ken Sakamura of Tokyo University.

TRON stands for **T**he **R**eaL-time **O**perating System **N**ucleus, and has been a trial for standardizing a series of operating systems for different purposes that are intended to form the information infrastructure of a human society. Because human beings live in a physical space and real time, computers need to work in accordance with the same space and time. That is the meaning of the word real-time being included in the name of the project.

HFDS (Highly Functionally Distributed System) investigated in the TRON Project is very close to the Earth-Scale Operating System. I have been strongly influenced by TRON because I was involved in development of TRON operating systems and their applications through my work at Hitachi, Ltd. and other companies in the past.

Shell (p.128)

Reference: Shell (computing) - Wikipedia, the free encyclopedia.

[http://en.wikipedia.org/wiki/Shell_\(computing\)](http://en.wikipedia.org/wiki/Shell_(computing))

As mentioned in the explanation of **operating systems** (p.156), an element of a system that takes charge of the interface with human users has traditionally been called the shell.

I think that the Earth-Scale Operating System is very difficult to make. But, I thought that if we ever make it, we should begin with the shell, because an operating system would look like its shell for human beings.

If we begin our design from the shell, we can progressively develop the system while verifying how we should be using the Earth-Scale Operating System. Through this process, requirements for the outer-kernel will be clarified. Existing real-time kernels, I think, should suffice as the inner-kernel.

I have been developing a prototype of the Earth-Scale Operating System Shell. In fact, *i*-WAT is part of it.

Carbon Nanotube (p.131)

Reference: Carbon nanotube - Wikipedia, the free encyclopedia.
http://en.wikipedia.org/wiki/Carbon_nanotube

Carbon nanotube is a material structured like a tube made out of carbon atoms. It has half the weight as that of aluminum, is twenty times as strong as steel, and at the same time, shows elasticity. It is expected as a material to be used for space elevator ribbons and many other future applications.

Space Elevator (p.132)

Reference:

- (1) Space elevator - Wikipedia, the free encyclopedia.
http://en.wikipedia.org/wiki/Space_elevator
- (2) LiftPort Group - The Space Elevator Companies.
<http://www.liftport.com/>

A space elevator directly connects the ground and satellite orbits. The theory behind such an elevator is as explained by the scientist at the end of the story; a long string is stretched so that it balances itself between the gravity of the Earth and the centrifugal force by the rotation (Reference (1)).

In fictions, space elevators appear in “3001: The Final Odyssey” by Arther C. Clarke, for example. But it is a technology far more realizable than a wormhole.

According to the plan by LiftPort Group, which is a group of companies that aims to actually build a space elevator (Reference (2)), the elevator is going to be built above the Pacific, and through the thin, 50,000km long carbon nanotube ribbon, some robots called *lifters* powered by photovoltaic cells climb up and down to carry freights or people to and from space. LiftPort Group is preparing for their first lifting on October 27, 2031.

When I wrote the first manuscript on which this story is based in 2004, they were looking for April 12, 2018, implying that the plan has been delayed.

In today’s world, we need money to do virtually anything. From many articles, it looks as if LiftPort Group has in fact been suffering from shortage of money.

I am very interested in determining whether or not human race can actualize truly important and planetary-scale technologies such as the space elevator, without changing the today’s system of economy.