



Japan through the ages

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Predecessor's original farming wisdom



Photo by Takeru Munakata, Kesuke Uda

Japan was able to develop economically quickly thanks to post-war development of technology. This progress is especially obvious in the field of agriculture. For example, while in the past the hoe was used to plow, now a tractor is used in its place. Mechanization has made big changes to agriculture. Before these changes, farmers usually did their work by hand, but now most work is done by machines. Losing traditional Japanese agriculture is big problem. The Japan times is conducted a research to see how agriculture was done in the past.

In the past, agriculture was mainly done with agriculture tools rather than machines. Agriculture technology was developed along with the equipment was used for agriculture, and the machines such as combine can see trajectory of revolution to agriculture technology. But this equipment brought its own

problems, in which as it became used more widely in the society. So, maintaining of the original equipment and the knowledge of how to use it became harder to pass down. In addition, the young Japanese interest in being involved in agriculture has been decreasing as other career choices became more attractive. In Japan today, old farming methods are declining. This is especially serious in the case of young farmers. To deal with this situation, the Ministry of Agriculture, Forestry and Fisheries is promoting activities in which elementary school students can experience traditional Japanese agriculture. The purpose of this activity is to pass on the traditional Japanese agricultural traditions and to make agriculture attracting so the number of farmers will increase in the future. This may be a good opportunity for these children to learn more about agriculture. One of such

activities is 'rice field classroom'. This event held in the Nishogakushakashiwa junior high school every year. This activity involves borrowing the use of rice field from former graduates of our school and experiencing use of them, though rice planting and harvesting. When heard from student who had finished this experienced the activity. The students were glad and intrigued to learn much about traditional rice planting and harvesting. In the program it is possible to hear many stories, including experience of other traditional agricultural techniques. This activity will give influence on students every year.

In additions, such activities are spreading throughout Japan. Agricultural experience activities like this are being offered not only to Japanese but also foreigners. In fact, these activities are more popular among foreigners. This may be

because, Japan has unique traditional agriculture from the past. Though this activity many foreigners who wants to farm on Japanese soil come over seas to experience them. After they experienced it many of them spread it such as the SNS and more come.

Traditional agriculture progressed though the development of tools. However, the use of these tools has declined with the advent of today's agricultural machinery. Furthermore, since the interest in agriculture has faded away compared to former times, it is necessary to convey the wisdom of traditional agriculture.

By Ukyo Hamashima
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Living in era made by trains

Japanese railway technology has developed to become the most advanced in the world, including Shinkansen and linear motor cars. The reason why it has developed up to this level is due to continuous improvement. Among these improvements were four trains that changed era. First of all, the "Hanif1" was manufactured in 1904. This train is the first train that made in Japan. The body was made entirely of wood. It has become possible to run at high speed by having its original rail. This train is the origin of Japanese railway technology. The Next train is the "NADE6110". This train became the origin of the current commuter train. This train was made in 1914. The train's bodies were made of wood. This train was made to cope with the increasing number of

passengers. In the cities. And this train was made about one point five times as long as "Hanif1", and could carry about twice as many people as "Hanif1". In addition. There were three doors on side of its body. Because of that, despite the increased number of passengers, getting on and getting off was easy. The third one is the "ED40". Electricity began to be used on the train from this train. The ED40 type was invented as the first domestic electric locomotive for the main line of the Japanese National Railways (JNR). Before, electrification, the crew suffered from the smoke that filled the tunnels. So, people needed electric locomotive. This was a big turning point. Like, "NADE6110 was exchanged for "ED40". Mainly used for transporting materials, the

"Aputo type" was adopted. In particular, safety was improved and there was the advantage of lower costs. The last train is the "OHA31". This train was made in 1927. From this train, the train body is no made of wood. The crucial difference between this model and older model, is it was made of steel. The old models were made of wood, but there was a problem, wood was too weak. The better technology became, the faster trains ran. And, the faster trains ran, the worse accident became. Wood train bodies were not able to coop with impacts in accidents. So, the Japanese government decided to make trains from steel, and, the "OHA31" was made. But the structure of this train was no different from the old one. There was no mechanism to make the weight lighter. This problem

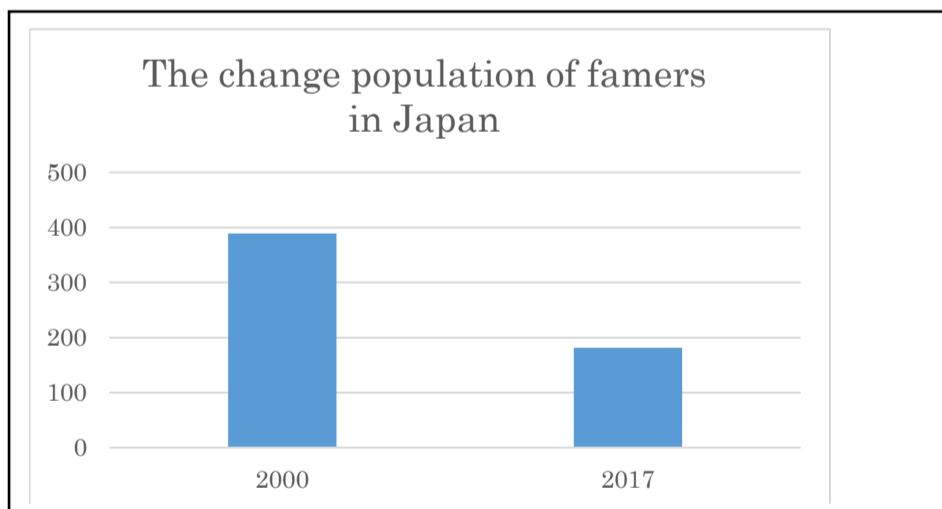
was solved too. Making improvements like this many times became one of the factors which now makes Japanese train's technology very high level and, Japanese people can be proud of this.

By Kyo Okano
Haruki Kitagawa
Haruya Hirotaki



The picture of ED4010
Photo by Haruya Hirotaki

Agriculture like a hobby



Population of famers has been decreasing. Photo by Takuto Yamaguchi

Nowadays, the problem facing Japanese agriculture is a lack of farmers. The number of farmers in 2017 is twice as large as in 2000. We are pushing for farm

mechanization to solve agriculture's shortfall. At present, machines can be used for sowing seeds separating the crop and threshing it.

In addition, workers can manipulate machine alone. Farmers can use drone like a radio control. Until now, they have used expensive unmanned helicopters for sprinkling agricultural chemicals, and it was more difficult to manipulate than drones. One of the advantages is it is one-fifth as expense as unmanned helicopters. Another advantage is "precision farming." In large farmland, there needs to be attention payed to the amount of agricultural chemicals used, and there are variations in the quality of crops. It can tell farmers not only about growing conditions, but also symptoms of pests and blight so they can take measures against

it. This is called "precision farming". It frees farmers from hard work such as fertilizer spraying, and aim for improving harvests as well as the quality of crops. Agricultural mechanization's progress will make farming easy. These days, the number of farmers has been decreasing, so we can say it is good choice to start mechanizing agriculture.

By Takuto Yamaguchi
Mizuki Watanabe
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Ticket gate's progress

In 1872, the first train in Japan ran between Tokyo and Yokohama. At that time, it cost people more than ¥5000 to get on the train, so people who could ride trains were limited. However, these days, we can go to Yokohama from Tokyo by train for only ¥450 and most people use trains as a common transportation so, people probably can't live without trains. It enables us to move to somewhere quickly. To be sure, trains have been evolving over time, but ticket gates also have been evolving as well. 30 years in the past, station staff used special scissors and cut the ticket one each to make the tickets were processed. There manned ticket gates lasted 60 years in subways. This method took people long time to go through

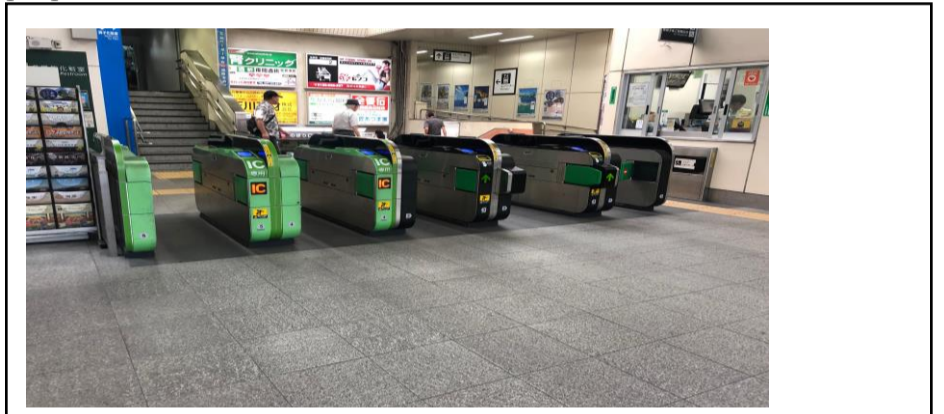
the ticket gate and the burden of station staff has also heavy. So, the automatic ticket gates like we are using now were invented. In fact, the country that introduced it for the first time was Japan. At first, it was used by private railways of the Kansai region and subways in the 1970's. It spread throughout Japan due to JR in the 1990's. In the end, it become popular in Japan in the 2000's. At the same time, IC cards, Suica and pasmo, which enables us to go through ticket gates only by placing them in front of the reader were invented. It increased the automation of ticket gates. Moreover, we can use it not only to go through ticket gate but also to enjoy shopping now.

Automatic ticket gates have been becoming more comfortable

until now, but it may disappear in front of our eyes in the near future. It is said that people will be able to take a train just by walking on the floor. According to the article, this floor has a sensor that can read the data of the IC card. If you do not have enough money to take the train, the floor will flash red. We don't have to place it in front of the reader, so it is thought that it will enable people who use wheelchairs and

strollers to go through the ticket gate very easily. Mitsubishi this special floor and they aim for its introduction in 2025. Ticket gate continue to evolve as well as trains.

 By *Takuto Yamaguchi*
Mizuki Watanabe
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this scene may disappear in near future. Photo by Takuto Yamaguchi

Welcome to the future of Agriculture



Are we able to grow it up in space?

By Yurika Kawamoto

It seems as if people will not be able to live on the earth due to the effect of global warming. Plans

and studies to emigrate to another planets are increasing. But carrying food and water by rockets involves enormous costs.

We should reduce the cost to this emigrate plan become real.

Therefore to stay long in space, a long-lasting agricultural system will be needed there.

Greenhouses are regarded as the most likely approach to this system. Inside a green house, the light and temperature are controlled to grow a lot of vegetables efficiently. NASA find lettuce, tomatoes and strawberries grow up easily in the space through the experiments in space. And they can grow up in small spaces.

In addition, the planets in greenhouses are able to regenerate air and process dirty water and human waste. For example, the plants in the

greenhouses can make oxygen from the CO2 produced by astronauts, through photosynthesis. At present, NASA use complex machines to remove CO2 in space ships. But it costs much money to do it. In the future, plants will be able to do it without much money. And of course, we can harvest the crop.

In short, greenhouses can reproduce a small ecosystem from the Earth. Studies to make better use of greenhouses are being progressing right now.

 By *Yurika Kawamoto*
Harumi Suzuki
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The Trains of the Future

Human beings have been searching for advancement in technology to make our lives easier. Particularly the advancement made in the last few hundred years has been astonishing. The Maglev Car or the Linear motor car as it is called in Japan is going to be in use soon. Some say it might replace the bullet train. But that's not the goal for the advancement in transportation technology.

There is an idea called the "Hyperloop". The idea was originally proposed by an inventor George Midhurst and used for bag transportation. It used a vacuum to transport baggage. That evolved over time to transport human beings. The basic idea of the Hyperloop is to create a vacuum in a tube and make pods, which people ride in, travel through by floating with electromagnetic fields so the amount of resistance will be low as possible and theoretically be the fastest way to travel. If this technology becomes reality the distance between Los Angeles and San Francisco, which is

610km, will be able to be travel in 30 minutes. In 2017, an experiment was conducted using actual size equipment at a test track located north of Las Vegas. Devloop, the company which held the tests says it was able to reach the maximum speed of 240 miles per hour. That's about 390 kilometers per hour.

But there is a big difficulty that needs to be overcome before making this a reality. One of the biggest is the stabilization of the air pressure inside the tube. To keep the pressure low in such a big area an extremely powerful decompression system is needed. The system causes a lot of heat dissipation and it might cause the system to overheat. Putting an exhaust pipe will solve the problem, although it will cost a lot of money. There is also the problem of the expansion and contraction of the tubes. This could be eliminated by leaving space around the pipe, but its area difference would be the size of a few soccer courts. Some people, such as Phill Mayson, an English scientist, says there may be a chance



Picture of Tokyo Station

photo by Rikuto Nagashima

that the pipe being pushed by air pressure from outside and there being no counter force to push it back from the inside could collapse. Even with these difficulties, the Hyperloop is becoming closer and closer to reality. A company called Virgin Hyperloop One announced with the Saudi Crown Prince Mohammed bin Salman that they have built a prototype of the travel pod for the Hyperloop. Their plan is to build a working Hyperloop system that will allow travel

between its neighboring countries by 2030.

With the production of new technologies like Hyperloop the world is coming closer to the world we see in scienc-fiction movies. The day the Impossible will become possible maybe closer than you think.

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