

We Are *Tomodachi*

Winter 2019

◀◀◀ FEATURE ▶▶▶

A Society with Health and Longevity

Coping with an aging society
to live healthily and enjoy a better quality of life



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You'll also find the articles of all past issues of "We Are *Tomodachi*" (<https://www.japan.go.jp/tomodachi>).



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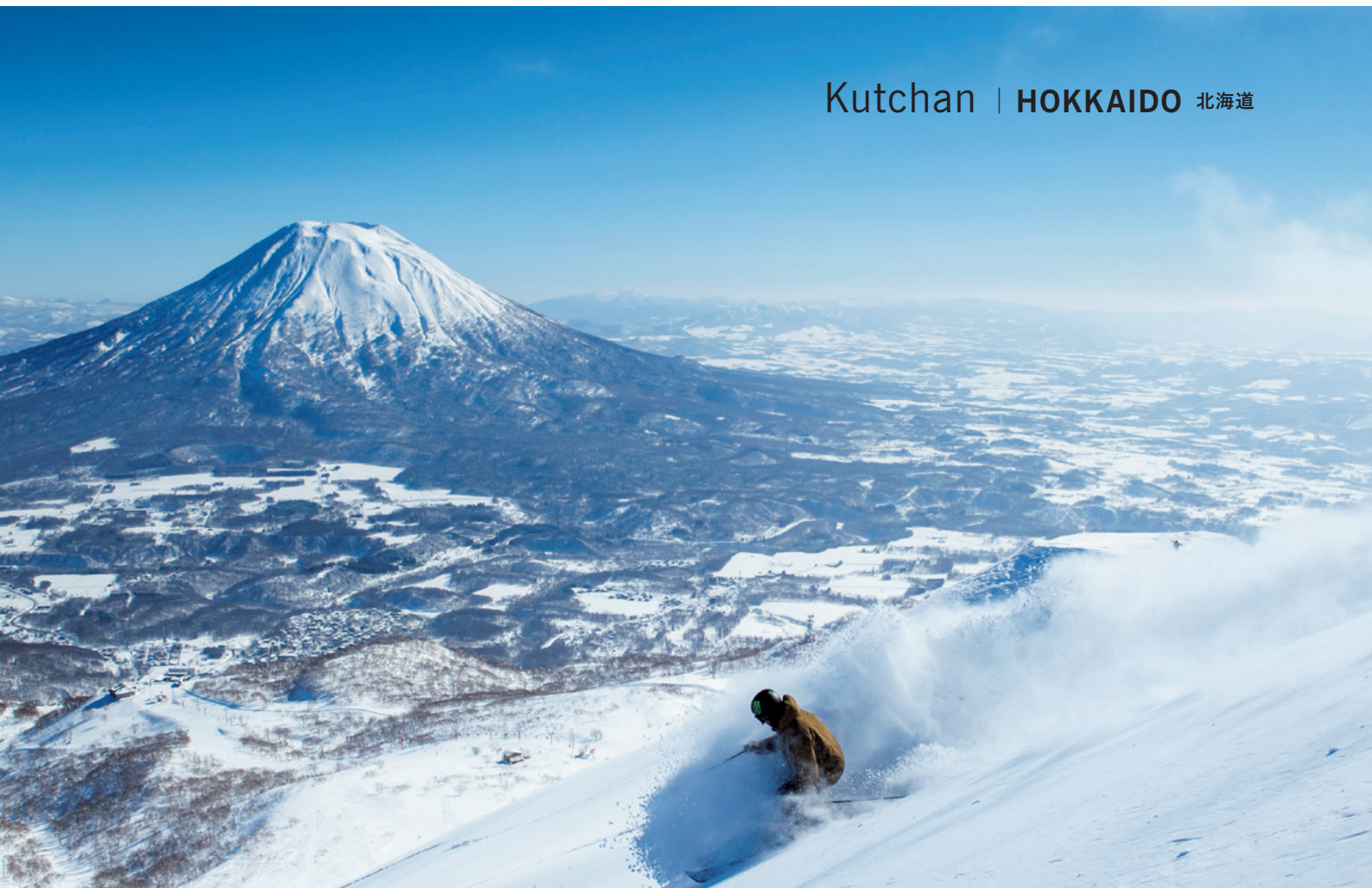
From November 30th to December 1st in 2018, Prime Minister Shinzo Abe attended the G20 Buenos Aires Summit and met with world leaders in the Argentine Republic. At the closing session, he told the world that Japan was enthusiastically preparing for the G20 Summit to be held in Osaka in June 2019.



Motion and Stillness of Winter in Japan

The Japanese archipelago, which offers a rich kaleidoscope of scenery over the changing seasons, takes on a variety of appearances across its various regions even in wintertime. World-famous virgin snow or a sacred mountain revered since ages past—the choice is yours.

Kutchan | **HOKKAIDO** 北海道





Beguiled by the fragrance of plum blossoms

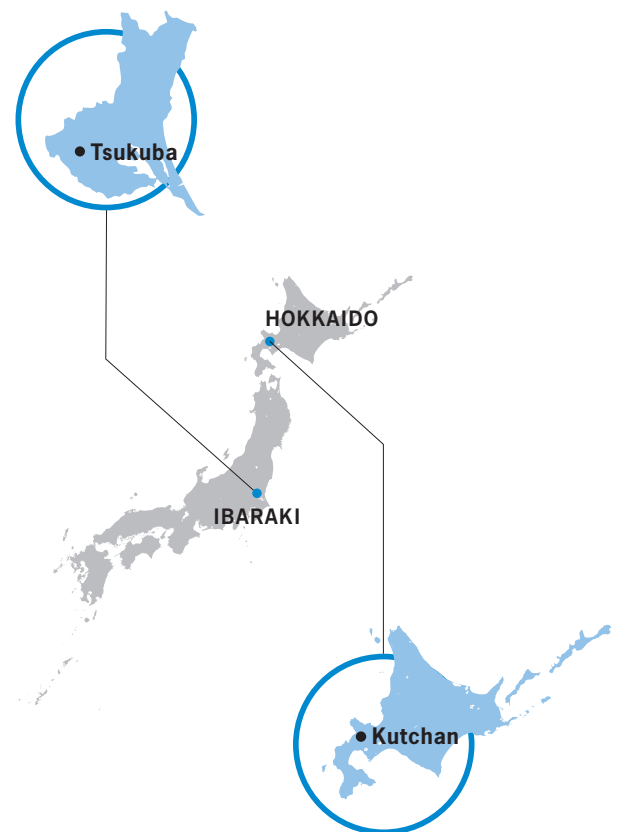
Tsukuba City in Ibaraki Prefecture, where the Ministerial Meeting on Trade and Digital Economy will be held as part of G20 2019 JAPAN on June 8 and 9, 2019, lies about 50 km northeast of Tokyo. The plum groves that grace the mid-reaches of Mt. Tsukuba feature white, red, and green flowering plum trees that bloom in succession from the end of January to the end of March, filling the slopes with the delicate fragrance of plum blossoms. In fine weather, one can see all the way to TOKYO SKYTREE and Mt. Fuji from the observation deck.

<http://www.ttca.jp/>

Ensnored in powder snow

The town of Kutchan, located in the southwest of Hokkaido, is the core town of the Niseko Kutchan Resort, a particularly popular winter resort area in Asia. Between December and February, ever-fluffy "virgin snow" falls on the city, which welcomes ski fans from all over the world. This town, inhabited by people of 47 different nationalities, will be the venue of the Tourism Ministers' Meeting as Japan hosts its first-ever G20 Summit on October 25 and 26, 2019.

<http://www.niseko.co.jp/en/>





Born in Kyoto in 1942, Tasuku Honjo received a M.D., Ph.D. in physiology from the Graduate School of Medicine at Kyoto University in 1975. His titles include Deputy Director-General and Distinguished Professor of the Kyoto University Institute for Advanced Study, and President of the Foundation for Biomedical Research and Innovation at Kobe. He has also been recognized as a Person of Cultural Merit and received the Order of Culture.

FEATURE >>> A Society with Health and Longevity

A Major Discovery to Help in the Fight Against Cancer

Dr. Tasuku Honjo of Kyoto University won the 2018 Nobel Prize in Medicine. His findings have led to the development of new cancer treatments.

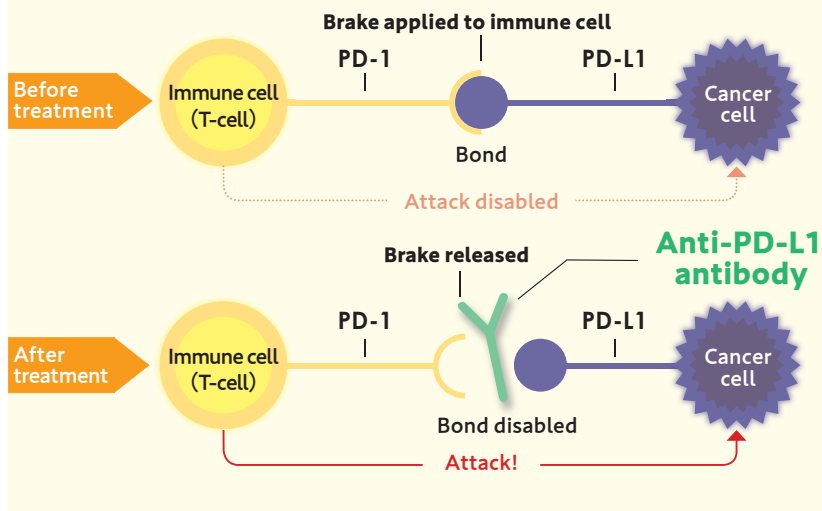


At Kyoto University, Dr. Honjo smiles in the company of students and researchers overjoyed at the news about his winning the Nobel Prize.

For everyone alive today, cancer is a major threat. Many avenues of research are being explored throughout the world to establish reliable treatments. Among them, the results achieved by Tasuku Honjo, Distinguished Professor at Kyoto University Institute for Advanced Study, are recognized as unprecedented.

Dr. Honjo has shed light on “PD-1,” a protein on the surface

Immune system brake-release mechanism



The mechanism discovered by Dr. Honjo's research.

When a PD-L1 protein of a cancer cell binds to the PD-1 protein of a T-cell, which is the body's main weapon in the fight against cancer, brakes are applied to the T-cell's immune response. An "anti-PD-L1 antibody," developed according to this method, can release the brake, allowing the T-cell to resume its attack on cancer cells.

of immune cells that suppresses their ability to function.

His research began quite by accident. Fascinated by "a protein with no apparent purpose" found by a graduate student in his laboratory, Dr. Honjo named the protein "PD-1" and began probing its secrets. Gradually it became apparent that it acts like a "brake," shutting down the immune response.

"As someone who cares about medical science, I'm always thinking about how to connect basic research with diagnoses and the treatment of disease," he says. Further research established that this brake stops immune cells from attacking cancer cells, followed by the discovery that, by releasing this brake, it was possible to restore the inherent immune potential of the human body and thus fight the cancer. Conventional cancer treatments generally work on the principle that radiation or anticancer drugs "directly attack"

the cancer, but this marked the dawn of a completely new method.

Once this idea had been validated by clinical trials, the new approach was used to develop new cancer treatments, which, being particularly effective for certain types of cancer, are now being used all around the world.

Yet, the fact that this effect is not seen in all cancers and for all patients is a significant challenge. "This therapy is still at an early stage, like the penicillin stage of treating infectious diseases," he explains. "Further research is needed to discover the reasons why it doesn't always work, and to make it effective for more people." He adds with a note of hope: "As happened with our ability to treat infectious diseases, the day will surely come—by the end of this century at the latest—when humans will no longer be threatened by cancer."

Quite a few persons have recovered from serious illness

by treatments arising from his research. Whenever such a former patient thanks him personally, he says it gives him profound satisfaction.

"To directly witness the meaningfulness of my research, and to have won such a prize—I feel very fortunate."

Eternally curious and skeptical about anything he hasn't seen with his own eyes, he continues to be occupied by the challenge of finding new possibilities opened up by PD-1 from his laboratories in Kyoto and in the Kobe Biomedical Innovation Cluster (see pp.8-9)—such is the diligence that permeates a life devoted to research. ✨



Dr. Honjo attending the Nobel Prize Award Ceremony (Stockholm, December 2018) dressed in traditional Japanese formal attire consisting of a haori jacket and trouser-like hakama.

The Kobe Biomedical Innovation Cluster occupies the southern half of Port Island, a man-made island in the port of Kobe. With plenty of space for neighbors, more medical-related companies are anticipated to be located here in the future.



FEATURE >>> A Society with Health and Longevity

A Biomedical Cluster Taking Medicine to a New Stage



Working toward longer, healthier lives for its people, Japan is boosting its medical sector. A cluster of medical industries emerges out of Kobe as a new model for society.

The Kobe Biomedical Innovation Cluster—containing about 350 research institutions, hospitals, universities, pharmaceutical companies, medical device manufacturers, and other corporations as of 2018—is the greatest concentration of biomedical research and development in Japan. Leading-edge treatments are being developed here through partnerships between industry, government, academia, and the medical community.

The impetus for starting the cluster was the Great Hanshin-Awaji Earthquake of January 1995,

which devastated Japan's Kinki region. Especially hardhit by the disaster, Kobe decided to respond to the unprecedented destruction by reconstructing itself creatively as a city with a strong biomedical sector.

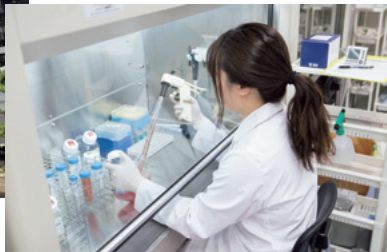
Dr. Hiroo Imura, the honorary president of the Foundation for Biomedical Research and Innovation at Kobe (FBRI), remembers it this way: “We were aiming not just at recovering from the earthquake, but at starting something new. With the on-going transformation of Japan into a nation with fewer young people and more seniors, we knew



Dr. Hiroo Imura, M.D., Ph.D. is honorary president of the Foundation for Biomedical Research and Innovation at Kobe, and former President of Kyoto University. He served as the director of Kobe City Medical Center General Hospital, which lies at one of the core institutions of the developing biomedical cluster.



The Translational Research Informatics Center is an information base that promotes translational research. An environment is being created that allows researchers to move smoothly between basic research and clinical practice, thus contributing to the development of medical science.



that medicine and health would be growth industries.”

The vision of “translational research” has guided the foundation’s course. This requires an ecosystem-like transfer of ideas and skills from basic biomedical research into diagnosis and treatment, with hands-on involvement by medical businesses. The foundation directed its efforts towards projects such as creating the Translational Research Informatics Center, Japan’s first research institution to promote translational research.

Since RIKEN, one of Japan’s leading comprehensive research organizations, had already established an operations center in Kobe, the plan moved forward swiftly.

“People had concerns about

the suitability of Kobe, which had lacked an infrastructure for the medical sector,” recalls Dr. Imura. “But with the RIKEN laboratory and the Foundation for Biomedical Research and Innovation at Kobe at the core, and through promoting the concept of translational research, more and more companies joined in. That is the character of the Kobe cluster, and its strength.”

RIKEN also decided to locate the K computer, developed jointly with Fujitsu Limited, in the cluster. The availability of its vast computational power is a tremendous asset to companies seeking to develop new products such as pharmaceuticals and medical devices. Development is also underway on the post-K supercomputer, with plans calling

for installation at the same location, and full operations to begin around 2021.

Results that contribute to global society are already beginning to take shape. In 2014, a patient with age-related macular degeneration, which occurs as a person ages, was treated by a team led by RIKEN, Kobe City Medical Center General Hospital and FBRI which achieved the first transplantation of retinal pigment epithelium sheet grown from the patient’s own iPS cells (induced pluripotent stem cells). That was followed in 2017 by the transplantation of retinal pigment epithelium sheet grown from another person’s iPS cells. At the Kobe Eye Center, specialized eye research continues to advance. As the population grows older, the practical implementation of regenerative medicine is gaining attention.

“Since Japan is aging faster than other nations, we need to promote medical innovation for the benefit of the world,” says Dr. Imura.

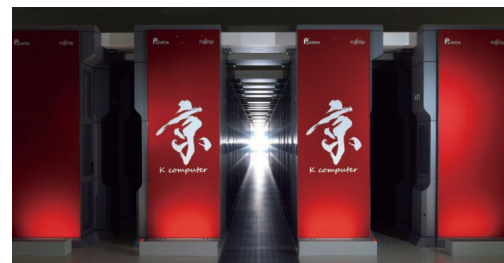
Having marked its 20th anniversary in 2018, the Kobe Biomedical Innovation Cluster is poised to continue making contributions to world’s health. ✨



Designed as a one-stop center for eyecare, the Kobe Eye Center was established in December 2017 with facilities for research, treatment, rehabilitation, and even social support, drawing patients from all over Japan. The facility includes a light-and sound-guided climbing wall, which makes rehabilitation fun.



The K computer jointly developed by RIKEN and Fujitsu Limited. The post-K supercomputer is currently in development with the goal of achieving 100x improvement over the K computer in terms of application execution performance.



Unconventional Speakers Deliver More Than Words

The “Mirai Speaker” developed by SoundFun Corporation, a venture in Tokyo, has captured attention for being easy to hear, even for seniors

Kazunori Sato’s invention was a product of fortuity.

Just as he was thinking about doing something for the elderly, including his own father, who are hard of hearing, he had a eureka moment when he learned from an acquaintance that older people can hear better from old-style phonographs with their flared-horn speakers than they can from normal audio speakers.

Focusing on the “bend” in the horn of the phonograph, Sato developed a “barrier-free sound,”

through trial and error with an engineer, that differs from the concept of conventional speakers to make it more audible to hearing-impaired people. In 2015, the Mirai Speaker was released.

“It sounds completely different” says Akemi Kumagai, a woman with a serious hearing impairment, who collaborated in the development of the speaker and who herself uses it connected to a TV. “Even without raising the volume, the speech sounds impressively clearer, as if it were spoken with emphasis.”

The Mirai Speaker of SoundFun is characterized by the fact that it reproduces speech much more clearly than conventional speakers. Moreover, as the sound attenuation over distance is very small, there is no risk of people’s words being drowned out by surrounding noise even over a wide area.

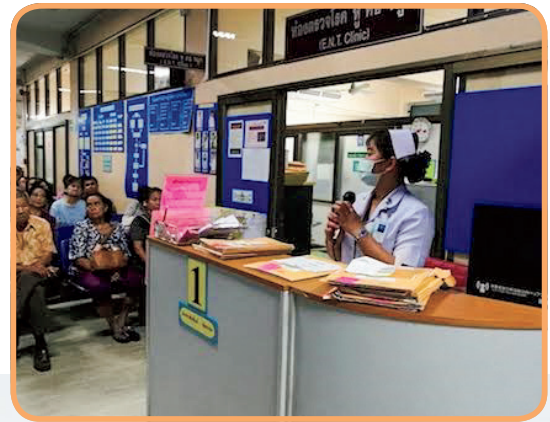
The secret lies in the curved diaphragm. “Compared with conventional speakers, which use a conical diaphragm that emits sound from a single sound source, the sound, coming out of a curved





Left: The next-generation Mirai Speaker "Filmo" features superb audibility for seniors and the hearing impaired, and also displays information on a transparent piezoelectric film (Concept model, not for sale).
 Right: "Mirai Speaker Moby", a portable speaker that can be used at disaster sites and elsewhere, will be released early in 2019.

The speaker was introduced on a trial basis at a police hospital in Thailand.



diaphragm with a curved flat plate, has more energy," Sato says.

The speakers address the needs of individuals. The company receives many inquiries, especially from people living with their elderly parents. Kumagai says that "when you are unable to hear, you feel down. You give up and lose the will to proactively take on challenges." The Mirai Speaker has gotten rave reviews from those who have purchased it, such as one person who said "my parents have suddenly become livelier."

In the words of SoundFun President Hiroshi Yamaji, "It is encouraging to hear that just by being able to hear better, people become more interested in life, and even their facial expressions change, and they become more active."

The average age of employees at SoundFun is 55, and highly experienced engineers who have reached retirement age elsewhere are energetically working here. They are driven by the desire to help people in need, and every day they enjoy developing things with

a sense of purpose.

The corporate philosophy of SoundFun is "making the world happier through sound." Initially, Mirai Speakers were developed for people with hearing impairments, but as a sound barrier-free speaker, Mirai Speakers can also be used to good effect for announcements at locations such as airports and stations. Yamaji says that he wants to help people around the world through sound after establishing a solid footing in Japan.

According to the World Health Organization (WHO), the number of hearing-impaired people in the world will nearly double to 900 million people by the year 2050, due to the increase in the number of elderly people, etc. [1] When communication becomes impossible due to age-related hearing loss, stress in everyday life increases, which can lead to depression.

The Mirai Speakers of SoundFun will not deliver only sound but also a lot of smiles to such aging societies in the future. *

Along with two current Mirai Speaker models in different colors, SoundFun's president Hiroshi Yamaji, founder Kazunori Sato, and development collaborator Akemi Kumagai.(L to R)
<https://soundfun.co.jp/>



[1] World Health Organization (WHO)
 "Deafness and hearing loss," March 15, 2018.

Monitoring Health in Everyday Life

Using toilets as health monitors and detecting illnesses early from a single strand of hair—such advances show promise for the future of Japan and the world

Japan has the longest-living population in the world, with some 42% of the population predicted to be 60 or older by 2050. [1] Japan has thus recently focused on becoming a society that encourages people to live healthier lives as they age. The key is health

management and diagnostic technologies that are indispensable for heading off diseases before they strike. Unprecedented concepts are being researched and developed to perform those tasks in a painless, relaxed way.

One example is a new toilet

being developed, through a process of trial and error, by TOTO, a company that entered the field in the early 1990's, setting the goal of health management at the toilet. In 2005, in collaboration with a housing manufacturer Daiwa House Industry, it unveiled an "Intelligence Toilet" able to measure urine sugar, blood pressure, body fat, and body weight, and designed for an average home. Since then, it has developed a model that measures body mass index (BMI) and urine temperature (indicative of the body's core temperature), which enables a woman to predict her period and ovulation days. Sales have already ended, but its DNA has been passed down.

Currently, TOTO is selling the FlowSky uroflowmetry, aimed at medical institutions, and capable of measuring the volumetric flow rate of urine during urination, which are important parameters for diagnosing lower urinary tract symptoms. "Our research is guided by the idea that data about the body obtained during toilet visits is useful for a healthful and meaningful active life," says Michihiko Torio, manager of the Medical Equipment Business Promotion Section at TOTO. Optimistic about the future of health management by toilet

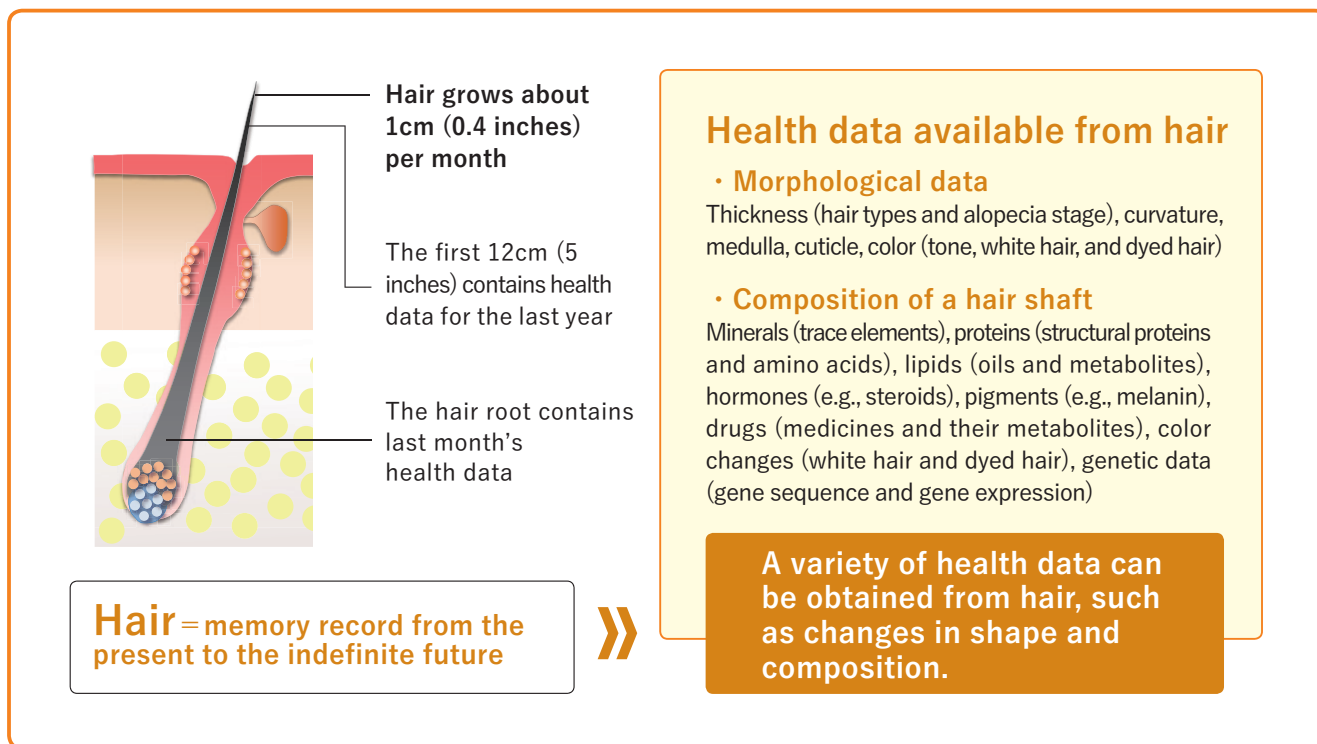
Blood pressure measurement
A wireless version, which takes measurements at the wrist, is easy to handle.

Display panel
With the ability to check measurement data over two- and six-week cycles, the panel can show the expected date of a woman's next period.

Body weight measurement
The scale installed on the floor measures body weight.

Body temperature, glycosuria level, and urine temperature measurement
The measurements are taken instantly, simply by urinating into the shining urine collector. It enables routine measurements during an ordinary day.

Intelligence Toilet: Designed to check your health, it also fits comfortably into residential spaces. The measurement log can be accessed at the toilet as well as by personal computer (prototype not available for purchase).



Hair is a "memory medium" that stores information about the condition of the body over time.

technology, Torio says, "Without a doubt, the way is opening up. We want to pursue possibilities that will serve society."

Another approach to painless, casual health check-ups may develop from the hair on our heads, each only 0.1mm in diameter (around 0.004 inches). Takashi Tsuji of the RIKEN Center for Biosystems Dynamics Research says, "We're looking at a society that can make health check-ups by hair in three years time, and diagnose disease in five years."

Tsuji has been investigating treatments to regenerate hair over many years. The hair of the head, which is an aggregation of dead cells originally produced by cell division of hair matrix cells deep in a follicle, grows about 1cm (0.4 inches) per month. That means that

health data, as a chronological log, is stored in the 1-cm segment closest to the root for the most recent month, and in the first 12cm (5 inches) for one year.

Tsuji believes that an analysis of both the shape of the hair and the status of substances such as the proteins contained inside, and using it as a chronological series of health data, will let us notice changes in health more quickly, and facilitate earlier discovery and response to such conditions as cancer and diabetes.

At the end of 2017, a group of businesses that agreed with Tsuji's ideas formed the "Hair Diagnostic Consortium" to develop a hair diagnostics project involving 10 different laboratories in RIKEN, with participation by 21 firms and organizations. The initial goal is to

build a database by collecting the hair health data of 10,000 people in two years, with the aim of the social implementation of health services and disease diagnosis by hair diagnostics. "By developing systems for hair diagnostics and giving individuals accurate health indicators, we can then head off diseases by utilizing health services based on scientific evidence," Tsuji says. "The goal is to help people stay healthy longer, and thereby bring about a society where people enjoy healthy, long lives."

As Japan undergoes the phenomenon of super-aging in the near future, the concept of painless healthcare may indeed become an important support for such a society. *

[1] From the 2017 United Nations study on World Population Ageing.

Restaurant of Mistaken Orders Brings Smiles

In Japan, known as a super-aging society, dementia is predicted to affect one in five people by 2025.^[1] In such circumstances, an innovative social experiment has caught the attention of Japan and the world.



It's called the "Restaurant of Mistaken Orders"—a restaurant where orders and deliveries sometimes go astray. Yes, we've come to a place where the waiters and waitresses all have some degree of cognitive impairment.

The impetus for starting this

pop-up restaurant comes from an encounter between the creator Shiro Oguni and a group home where people with dementia live. "Like everybody else, my awareness of dementia at first tended towards negative images of people who were 'radically forgetful' and 'aimlessly

wandering about.' But actually, they can cook, clean, do laundry, go shopping and do other 'normal' things for themselves. Close-up, they might go a little off course now and then, but..."

Lunchtime. The order was for a Hamburger steak, but Oguni was served a plate of *gyoza* (potstickers) instead. "As everybody around me was eating with such gusto, and I felt quite muddled and wondered if perhaps it was me who was in

Two out of three Japanese with dementia live at home, conditions conducive to isolation. They have the attitude of "rather than receiving assistance, I want to work, to be useful to the community," and the pop-up restaurant gives them a cheery place to do just that.



The restaurant has been carefully designed to avoid mistakes. Behind its success lies the extraordinary painstaking efforts of the management and others. "We wanted to make this a welcoming place where everybody feels comfortable."



The "Restaurant of Mistaken Orders" concept has had a long-ranging effect. Future events will be announced on their website. <http://www.mistakenorders.com/en/home.html>



error." Oguni noted, "Why raise our eyebrows at the difference between sizzling steak and gyoza? 'So it's a mistake, well, fine.' Given that kind of tolerance, the dining scene can become relaxed and delightful."

Made possible by the help of many people, the "Restaurant of Mistaken Orders" is indeed a place where mistakes happen. One older woman shows her guests to a table and then sits down with them. Another serves a hot coffee with a straw. Yet another older woman struggles to twist a large pepper mill, not entirely sure that the pepper will fall where it's wanted. Everybody at the table pitches in to help, and with cries of "We did it!" all join in the laughter. However, "The restaurant is not about whether orders are executed incorrectly or not," notes Oguni. "The important thing is the

interaction with people who have dementia."

Although succeeding as a "restaurant of never-ending laughter," Oguni was initially concerned about possible criticisms, such as, "Don't treat dementia like a carnival sideshow!" and "Don't make a laughingstock out of them!" But actually, when guests see the smiles of the staffers with dementia, and the joy that motivates their work, some feel a spirit of courage, while others are moved to tears. And invariably, the servers say such things as "I'm still capable. This has given me confidence." The negative image of dementia was replaced by a fun, positive one. "Calling someone 'The demented Mrs. Whozit' is completely different from 'Mrs. Whozit with dementia.' Dementia is not what a person

is, but just part of who they are. People are people. The change will not come from them, it must come from society," observes Oguni. "By cultivating tolerance, almost anything can be solved. The image of 'Cool Japan' is recently gathering much enthusiasm, but I think 'Warm Japan' is just as important. I want to promote a Japan that cultivates a warm, comfortable environment, so people will return home with smiles and a glow in their hearts." *



To finish things up, dessert is served with a bashful smile.

[1] 2017 Cabinet Office White Paper on the Aging of Society.

Prime Minister in Action

Prime Minister Abe continues to actively engage in “Diplomacy That Takes a Panoramic Perspective of the World Map.” From October through December 2018, he attended ASEM Summit Meeting, ASEAN-related Summit Meetings, APEC Economic Leaders' Meeting and G20 Buenos Aires Summit and met with world leaders, visiting countries of Europe, Asia, the Pacific and South America. In Japan, he held talks with numerous world leaders who visited Japan.



 Met with H.E. Mr. Emomali Rahmon, President of the Republic of Tajikistan, at the Japanese Prime Minister's Office. (October 2018)




 Met with H.E. Mr. Saulius Skvernelis, Prime Minister of the Republic of Lithuania, at the Japanese Prime Minister's Office. (October 2018)




Attended the Mekong-Japan Summit Meeting at Akasaka State Guest House and met with attending leaders at the Japanese Prime Minister's Office. (October 2018)



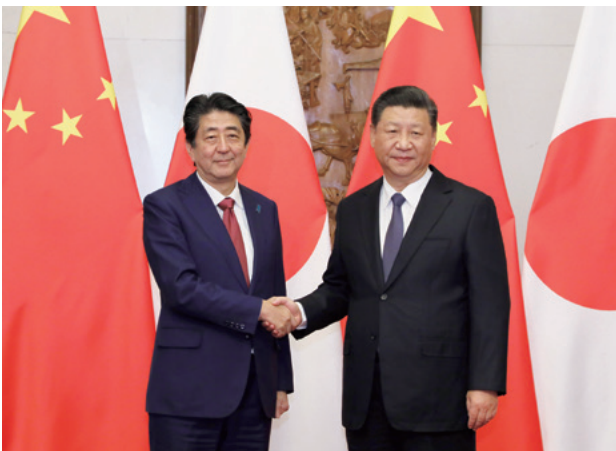
 Met with H.E. Mr. Pedro Sánchez Pérez-Castejón, President of the Government of Spain, in the Kingdom of Spain. (October 2018)




 Met with H.E. Mr. Emmanuel Macron, President of the French Republic, in the French Republic. (October 2018)



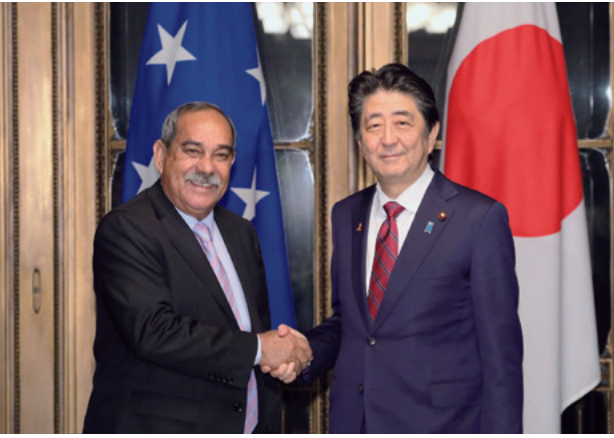
Attended the ASEM Summit Meeting and met with attending leaders, in the Kingdom of Belgium. (October 2018)




 Met with H.E. Mr. Xi Jinping, President of the People's Republic of China, in the People's Republic of China. (October 2018)



 Met with H.E. Mr. Narendra Modi, Prime Minister of India, and visited Yamanashi Prefecture. (October 2018)



 Met with H.E. Mr. Peter Martin Christian, President of the Federated States of Micronesia, at the National Diet Building. (November 2018)



 Met with Tun Dr. Mahathir bin Mohamad, Prime Minister of Malaysia, at the Japanese Prime Minister's Office. (November 2018)



Attended the ASEAN-related Summit Meetings and met with attending leaders in the Republic of Singapore. (November 2018)



 Met with the Hon. Scott Morrison, Prime Minister of the Commonwealth of Australia, in the Commonwealth of Australia. (November 2018)



Attended the APEC Economic Leaders' Meeting and met with attending leaders in the Independent State of Papua New Guinea. (November 2018)



 Met with H.E. Mr. Roch Marc Christian Kabore, President of Burkina Faso, at the Japanese Prime Minister's Office. (November 2018)




 Met with His Majesty King Abdullah II Ibn Al Hussein, King of the Hashemite Kingdom of Jordan, at the Japanese Prime Minister's Office. (November 2018)




Attended G20 Buenos Aires Summit and met with attending leaders, in the Argentine Republic. (November-December 2018)



 Met with H.E. Dr. Tabaré Ramón Vázquez Rosas, President of the Oriental Republic of Uruguay, in the Oriental Republic of Uruguay. (December 2018)



 Met with H.E. Mr. Mario Abdo Benítez, President of the Republic of Paraguay, in the Republic of Paraguay. (December 2018)

Vibrant Osaka

In 2019, the G20 Summit will open in Osaka.



Japan's major city is gaining more attention as it also gets ready to host the World Expo in 2025.



The scene of futuristic highrises clustering next to a feudal castle is quintessentially Osaka!



● [Osaka Info](https://osaka-info.jp/en/)
<https://osaka-info.jp/en/>

Castle Among the Highrises

Located in the city center, Osaka Castle, built in 1583, is Osaka's symbol. The Main Keep, rebuilt in 1931, is adorned with gold at every turn and offers a commanding view of the city from the top floor. More than 10 million people visit the popular Osaka Castle Park, in which the castle takes center stage, to enjoy such seasonal visual treats as plum and cherry blossoms and autumn leaves.

A Long History of Merchant Culture

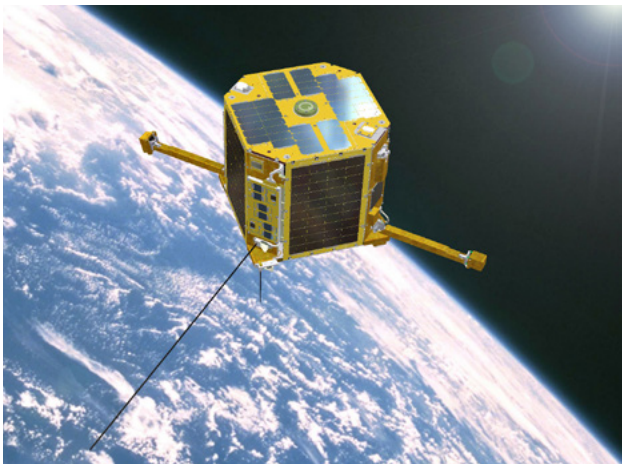
Called the “city of merchants,” lively Osaka has been flourishing for more than four centuries as Japan’s hub of commercial trade. In as far back as 1730, futures trading in rice was already operating in Osaka.



"Junkei machi Yomise no Zu" by Hiroshige Utagawa (Osaka Prefectural Nakanoshima Library)

Backstreet Monodzukuri Boosting Japan’s Industry

In Osaka, where *monodzukuri* (Japanese manufacturing) has flourished since ancient times, there are currently close to 10 thousand SME-operated factories. Every one of the small components produced at these places is supporting high-tech industries in which Japan is a global leader. When SMEs in Osaka join forces, they can even launch satellites.



Hanazono, Japan Rugby’s Hallowed Ground

The Higashiosaka Hanazono Rugby Stadium, opened in 1929, is Japan’s first rugby-dedicated stadium. In preparation for holding the Rugby World Cup in 2019, it has been revamped to become an even more state-of-the-art facility. Just like it has throughout its illustrious past, we can expect the stadium to stage many more dramas.



Savoring Unique Food Culture of Retro Downtown

Due to its role as an important hub for logistics and trade in the Edo Period, Osaka developed its own unique food culture under the identity of “Japan’s Kitchen.” Dishes known throughout the world, such as *takoyaki* (octopus balls) and *kushikatsu* (fried skewer cuisine), are some of Osaka’s major appeals.

New Biodegradable Material Reduces Plastic Waste

Injection-molded plant-based biodegradable plastic, which can be mass-produced with advanced technology, is the latest ray of hope from Japan to combat plastic marine litter

Petroleum-based plastic has now been part of human daily life for more than 70 years.

Plastic has brought convenience, but now is inflicting serious damage to the Earth. The amount of plastic waste drifting throughout our oceans has been estimated to be currently about 150 million tons, a figure rising by about eight million tons each year.^[1]

Showing promise as a fundamental solution to this grave problem, a revolutionary group of technologies is attracting attention. Developed

by Michio Komatsu, a Japanese mold technology expert, they comprise numerous processes for manufacturing biodegradable plastic products by injection molding.

Komatsu, president of a professional engineer's consulting firm in Iwaki City, Fukushima Prefecture, is focusing on the injection molding of a certain plant-based biodegradable plastic called polylactic acid, which is raising interest worldwide. Aiming to use it to replace conventional petroleum-based plastics, Komatsu has been

developing practical applications for it since 2005. Polylactic acid is decomposed by microorganisms in the soil or seawater, and if disposed in compost, it will return completely to nature as water and carbon dioxide in the space of only several months.

However, its development has not been easy so far. For example, the raw material cost of polylactic acid is expensive, it has low heat resistance, and forming it by injection molding is hard due to its poor fluidity. All that has made



Marine plastic litter doesn't only detract from beautiful nature. Microscopic plastic has a serious effect on both marine life and humanity as well.



Biodegradable baby tableware expertly designed to be completely curved. Inquiries are coming in from around the world due to the trust-inspiring “safe for babies and earth-friendly” message. <http://iiwan.jp/?mode=f82>

global action to prevent pollution of the ocean, I am confident that our Japanese-originated technology will be increasingly needed in the world,” says Komatsu. Commercialization has already begun. The baby tableware series iiwan is a polylactic acid product that Komatsu jointly developed with Hoei Industry Co., Ltd. of Shinshiro City, Aichi Prefecture.

These products are gaining popularity through word of mouth as “eco-friendly and safe for babies,” and are now being exported to the world. Inquiries from potential buyers are rapidly pouring in from countries in Europe and Asia. Takahiro Miwa of Hoei Industry is enthusiastic about this. “Going forward, we aim to offer both Japan and the world safe and environmentally friendly plastic products for not only children but people of all generations,” he says.

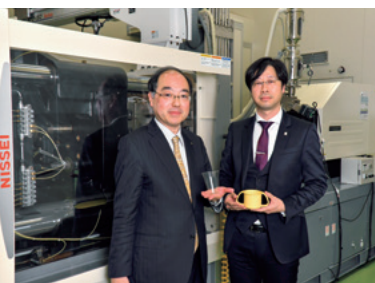
As product development advances, the possibilities for this new plastic are rapidly expanding. In fact, it may not be long before polylactic acid plastic from Japan revolutionizes the very concept of plastic. *

State of biodegradation under composting conditions for two, four and six weeks. Photo courtesy of Japan BioPlastics Association.



0 week ▶ 2 weeks ▶ 4 weeks ▶ 6 weeks

In front of the injection molding machine. Michio Komatsu (Left): President of Komatsu & Associates, he is Director of Japan Society of Plastics Technology. In 2018, he received the Prime Minister’s Award, The Monodzukuri Nippon (Japan’s manufacturing) Grand Award (honored with the title of Master of Monodzukuri) for injection mold technology of polylactic acid. Takahiro Miwa (Right): Executive Managing Director of Hoei Industry Co., Ltd., he joined Hoei Industry in 2002 and devotes much energy to the bioplastics products business. The product iiwan received the Good Design Award in 2011.



it difficult to commercialize.

“Always short of funding, I managed to continue my research and development by applying for competitions. I kept persevering by holding on to the simple belief that we had to start using polylactic acid to begin combating pollution of the ocean,” explains Komatsu.

Most people who hear the term “bioplastic” instantly assume that it refers to environmentally friendly plastic created from a biological resource. However, there are many types of plastic. Polylactic acid is made from plant-based materials and naturally decomposes, but other bioplastics aren’t biodegradable,

while some petroleum-based plastics are.

Among the various candidates, the entirely plant-based and biodegradable polylactic acid is most ideal for future use as an eco-friendly plastic that fulfills the criteria necessary to be considered harmless and non-toxic. Its raw ingredients are starch and lactic acid bacteria extracted from plants such as corn.

There is no one in the world currently that can surpass Komatsu, who has mastered various kinds of injection molding technologies for polylactic acid.

“As momentum picks up for taking

[1] Data from the Ministry of the Environment’s “Study of Domains Targeted by the Ministry of Environment” dated March 15, 2017.

Green Birds from Tokyo Take Flight in Paris

Flocks of “green birds” hatched in Tokyo have been flying across the oceans. Serving as captain of the “Paris flock” is a Japanese woman, Yoshiko Inai.



Shortly before 10:00 a.m., on a Saturday with rainy skies clearing, Yoshiko Inai is waiting at a bench in front of a park in the 14th arrondissement of Paris. On the bench at the assembly point is a set of cleaning equipment: green vests and gloves, vinyl trash bags, and large tongs. Today is the monthly tidy-up day. Some have seen the announcement on the website, others have seen messages that spread through SNS,



The uniforms are matching gloves and vests sent from Tokyo.

and now they form a group that includes both regulars of several years standing, as well as hesitant newbies. The event takes an hour: volunteers choose their own paths through the area, picking up litter that catches the eye. Today almost 40 people are involved.

Hatched in Tokyo in 2003, the Green Bird project is a volunteer organization that removes litter from the streets. The movement, starting from the concept of “cleaning your city can bring beauty into your heart” has spread, first through Japan and now worldwide. The Paris team dates from 2007. Inai first participated after reading an article on the Internet in 2009, and has served as leader since 2013. “Just as I was becoming frustrated by all the litter cluttering the streets, I learned about the movement and jumped right in. Everything looks so much better after being tidied up, and seeing the results creates good cheer. Making a civic



contribution also brings a certain feeling of satisfaction.”

An important part of the leader’s role involves communicating with the headquarters in Japan, and uploading information about monthly activities to the main Green Bird website in the form of a blog. Determining the monthly cleanup site is another important duty. Areas with heavy pedestrian traffic and lots of litter tend to be chosen as sites, and for a good reason. When a cleanup action is in progress, passers-by make comments. The attitude of “We pay taxes, so cleaning the streets should be the city’s job” is pervasive among Parisians, who are not accustomed to seeing litter being picked up by people other than employees of the city. Inai says, “We are often asked, ‘Are you trying to take away someone’s job?’ or ‘Is



Left: Braving cloudy skies after a rain, almost 40 people gathered for the November cleanup day. Below: All the litter collected during the hour is piled in a single location. By prior arrangement, a pick-up crew from the city collects the trash soon afterwards.



Carefully clearing away cigarette butts and candy wrappers. Their curiosity aroused, passers-by often strike up a conversation.

someone paying you?" But when I explain that we're volunteers, they respond favorably." She continues, "People litter every day, so picking up once a month is not going to keep the streets clean. The goal of our activity is not to keep the streets clean."

Clean streets create positive feelings, but littering is shameful. As that attitude becomes more widespread, people will gradually change their behavior. This is what Inai hopes will change the streets. As a way of spreading this attitude, the volunteers are like a mirror. And that, Inai feels, is the significance of what Green Bird is doing.

Ten years ago, most participants were Japanese, but now most are

non-Japanese. The number has grown over the years, and now 50 volunteers are not unusual. "It's satisfying that more people are volunteering, but there is less horizontal connection between the participants," says Inai. There's always one more thing to worry about. "I would like to foster the kind of communication that gets people ready to become leaders themselves."

Inquiries from surrounding countries are directed towards the Paris team, and with input from her, the Green Bird movement has spread to the German city of Stuttgart, to Cameroon and, under the name "Action Casa" to Morocco. "The vigor of the Paris team helps spread the movement to other European and Francophone nations, and it's fun to watch." Ten years after the Japan-born movement established itself in Paris, it has spread its wings to the surrounding countries. ✨



Yoshiko Inai

Born in Japan in 1975, she lived in Algeria from ages 0-2, and then in France from ages 8-17. Attending college in Japan, she studied comparative culture. After working for six years in a Japanese company, she went to France in 2004. Having participated in Green Bird events since 2009, she has served as leader of the Paris team since 2013.

A Milestone Project in Dhaka

After more than 15 years of combating the serious waste problem in Dhaka, Bangladesh, a Japanese team of experts has succeeded in changing local attitudes

In Dhaka, the crowded capital city of the South Asian country of Bangladesh, garbage used to pile up in vacant land and along river banks. In 2004, it was estimated that only 43.5% of garbage was collected, and the final disposal destination was exclusively landfill.

The Bangladesh government asked the Japanese government for cooperation to tackle this issue, and the Japan International Cooperation Agency (JICA) stepped up to help with Dhaka's waste problem. An integral player for this has been Akio Ishii, a waste management specialist who offered extensive skills and know-how from his involvement in government waste management at the Tokyo Metropolitan Government and his experience in development consultancy. After the end of a series of surveys and preparation of the Master Plan, a project coined the "Clean Dhaka Project" was launched in 2007.

According to Akiko Sanada, the officer at the JICA Bangladesh Office at that time, "Whether or not a capital city has the infrastructure to deal with issues like a garbage problem is a very crucial factor for attracting people and investment."

After setting a target of raising the garbage collection rate to



Bustling Dhaka is now much better at managing its waste.

65.5% by 2015, the Clean Dhaka Project helped implement a waste management approach based on citizen involvement.

The project established garbage collection offices in each ward and constructed a locally customized garbage collection system. At first, it was a struggle to start up any kind of communication between the citizens, city office staff, and cleaners due to a lack

of experience talking with people of different heritages and status. Ishii and the team held events such as a workshop in front of the Dhaka City Corporation Building that attracted 300 cleaners. These events established opportunities to link up the stakeholders, who were separated from each other by societal differences. It created the foundations for building a waste management system where



Garbage, collected in tricycle carts, is taken to a garbage truck that was donated by Japan, making collection very efficient.



Posters are created to show how to recycle, etc.



Still today, Ishii is in the field striving to expand the project to places outside Dhaka.



Each safety workshop held for cleaning crews attracts more than 300 participants.

everyone works together.

Then in 2010, the Japanese government donated 100 garbage trucks as part of grant aid. “Some of



After being the onsite project officer in Bangladesh for three and a half years, Akiko Sanada continues to support the project after returning to Japan.

the areas had never had a garbage truck before. Also we instantly established an efficient collection system,” explains Ishii.

Ishii says that as results accumulated, the project seemed to really generate enthusiasm. The cleaners became more aware of their important role of protecting the healthy life of citizens while the city office began to sense the need to work cooperatively with the cleaners. Meanwhile the citizens’ new-found enthusiasm to participate in keeping their own town clean has led to a continuing momentum through the holding of citizen-led “Clean Dhaka Events.”

As a result, the 2015 target of a 65% garbage collection rate was reached ahead of plan in 2014.

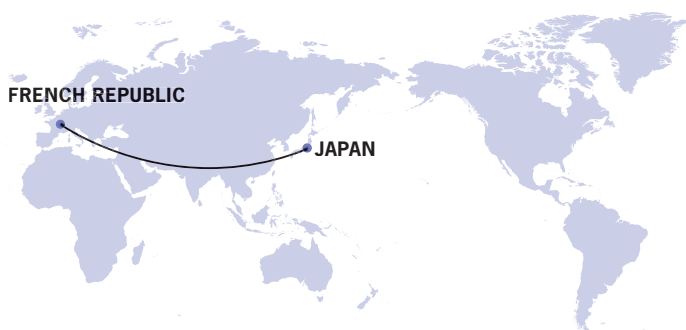
“This project also had a positive effect on government policy because the spirit of cooperation influenced how people worked together on not just the garbage problem but other issues as well. The garbage disposal experience seemed to change even the very culture in government offices,” relates Ishii.

The Clean Dhaka Project can be considered a “milestone” project that has not only changed the stakeholders’ mindsets with respect to garbage, but also changed the government’s approach to citizens and to carrying out public policy, and, perhaps, it will lead to further development for Bangladesh, whose annual economic growth continues above 7%. [1] ✨

[1] Japan External Trade Organization (JETRO) website, “Bangladesh Outline,” June 26, 2018.

With a Heart of Washoku

Having trained for two years at Kikunoi, one of Japan's top restaurants, and appointed a Master of Kyoto Cuisine and Ambassador of Japanese 'Heart' and 'Craft,' Clara Jacquier dreams of a "marriage" of France and Japan through her culinary creations



Jacquier arranging portions on *bento* lunch boxes in the kitchen. No knives are used in the early stage of training.



Since 2018, Clara Jacquier has been working in the kitchen of SaQuaNa, a gastronomic restaurant in Honfleur, a seaside town in Normandy, France. Jacquier is a Japanophile. Beginning with Japanese manga, literature and music as a teenager, she continued

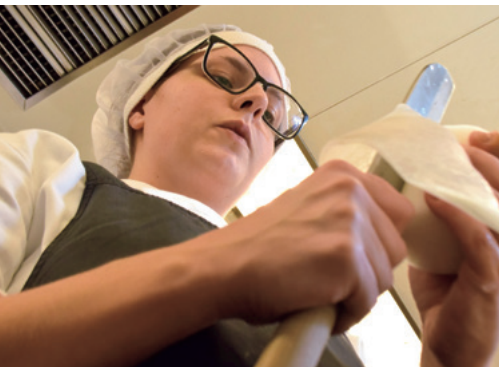
her interest while at the University of Paris, where she majored in Japanese language and Japanese culture. "When I was working in a Parisian bistro kitchen as a student, I decided that I wanted my future work to be related to my two favorite fields: Japan and cooking," explains Jacquier.

That was around 2013, the same time that *washoku* (Japanese cuisine) was registered as a UNESCO intangible cultural heritage, which marked the beginning of a movement to impart the knowledge of the real *washoku* by teaching it to foreign chefs. One day, a Japanese friend told her that Kikunoi, the renowned Kyoto cuisine restaurant, was going to accept a foreigner trainee in its kitchen. Having quickly sent off the application, Jacquier arrived in Kyoto in November 2015. She

recalls being immensely moved at how Japan was more beautiful than she'd imagined.

"The two years were a long string of many lessons. I began with arranging food on plates and then, as I gained experience, I moved on to arranging assorted artistic dishes representative of the season called *bassun*. Finally, after preparing desserts and serving baked dishes, I could take a position at the chefs' table. My most memorable experience was preparing soft-shelled tortoises. There are special procedures when dealing with snapping tortoises. After watching for many months, when I finally got my turn to prepare it, the experience was immensely emotional," explains Jacquier.

The practice in Japan of delivering live fish to the kitchen



Jacquier peeling a daikon radish in the Kikunoi kitchen. On her days off, she practiced knife skills at home.



Clara Jacquier

25-year-old Clara Jacquier was born in Auch, France. Having majored in Japanese at the University of Paris, she learned *kaiseki* cuisine at Kikunoi, a top Kyoto restaurant, for two years. Currently she works at SaQuaNa, a French restaurant in Honfleur, France.

was particularly startling. “I studied fish last. The reason for this was not because of the difficulty of skill involved but rather the special significance that fish have. In Japanese cooking, one prepares the fish without it suffering. Believing the fish should be respected and arranged beautifully, Mr. Murata, Kikunoi’s owner chef, visits a temple once every year to pay respect for all the lives taken in the kitchen. I felt this Japanese tradition of paying respect to the ingredients as a consistent spirit of *washoku*.”

In her current job at the Michelin two-star restaurant SaQuaNa, it is Jacquier’s job to prepare the fish. Its owner chef, Alexandre Bourdas, spent three years working at a renowned restaurant in Japan. Jacquier says, “Kikunoi’s Mr. Murata said that although he was

a French chef, he had a Japanese heart, and I should work at his restaurant.” Apparently, Jacquier was put in charge of fish because she understands Japanese cuisine’s respect of fish.

She says, “I also learned the meanings behind each of the Japanese dishes. *Osechi* dishes for celebrating New Year were most memorable. We incorporate the seasons in French cuisine too, of course, but in Japan, the seasonal sentiment is different for every month. More than simply using in-season ingredients, the dishes also reflect traditions and customs.”

On November 2017, not long after completing her two years at Kikunoi, Jacquier became the second person and first woman to be appointed a Master of Kyoto Cuisine and Ambassador of Japanese ‘Heart’ and

‘Craft.’ Jacquier, who would like to train in Japan again one day, wants to try creating French cuisine made with Japanese ingredients. “As I am interested in the fusion of Japanese and French cuisine, my own path going forward is to find out what shape this can take,” she says. ✨



Le Homard sur l’idée de Banh Bao, a dish from SaQuaNa. In this dish of lobster and rice arranged with vinegar-dip flavored dried seaweed, she demonstrates various techniques she learned in Japan.

Heartfelt Grassroots Exchange Between Austria and Japan

In Nasushiobara City, Tochigi Prefecture, Florentine Ronniger connects two countries with a national costume and a smile



Yuppo-no-Sato at Nasushiobara Onsen is one of Japan's largest footbaths measuring 60 meters long. It receives 60,000 visitors each year.



Florentine Ronniger

Born in Vienna, Austria. After graduating from the University of Vienna, where she majored in Japanese studies and art history, Florentine worked at Vienna's Art History Museum as an exhibition hall attendant and visitor assistant. She currently works as a CIR in Nasushiobara City, Tochigi Prefecture. Acting as a bridge for exchanges between the sister cities of Nasushiobara and Linz, she introduces Austrian culture to Japan.

Florentine Ronniger, who was born in Vienna, Austria, grew interested in Japan while in high school. Her interest was inspired by Japanese manga and anime. Driven in part by her Japanese classmate, her interest deepened, and at the age of 17, she decided to go on a homestay in Arakawa-ku, Tokyo, a sister city of the Donaustadt district of Vienna. The way the latest technology and traditions intermingled in the large city of Tokyo deeply impressed her. Florentine ended up majoring in Japanese studies at university. After graduating, she worked at a museum in Vienna but travelled frequently to Japan, which remained dear to her heart. "People in Japan were always so kind. I often got lost and time and again people would walk me to my destination. This really touched me. I really wanted to repay them for their kindness." This got her looking for a job that is culturally related to Japan, and when she saw a recruitment ad for the JET programme, she thought "This is it!"

She was hired as a Coordinator for International Relations (CIR) and assigned to a location some



In front of the villa of Shuzo Aoki, designated as an important cultural asset of Japan. Niklas Salm-Reifferscheidt, a descendant of Aoki, is the current head of the Salm family line that manages the Steyregg Castle (Schloss Steyregg) in Austria. "I feel a peculiar affinity for Japan," says Florentine.

150km north of Tokyo. This was the City Hall of Nasushiobara, Tochigi Prefecture, an area with rice paddies sprawling across Japan's largest alluvial fan, rich dairy farming, and famous for its hot springs. While Florentine admittedly was not good at public speaking, local people were warm and always showed solicitude and talked to her. Now in her third year there, she speaks Japanese fluently.

Nasushiobara has a sister city relationship with the city of Linz in Austria. Florentine's job is mainly to convey Austrian culture to local people. The regularly issued "International Sister City Newsletter" features articles such as the differences between the German used in Austria and Germany, as well as interesting pieces on themes such as "Do you take off your shoes at home in Austria?", promoting a sense of familiarity with Austria among readers. In lectures given at community centers, Florentine explains how to make traditional sweets such as the *Linzer Augen* (a pastry with red currant jam) and gingerbread cookies. "The

lectures are popular with people of all ages, from children to the elderly. In a lecture for parents and their children the other day, I interacted with 140 participants in a quiz format on a wide range of subjects including Austrian nature, sports and world heritage sites. At the end, we had fun all dancing a popular Austrian dance."

Nasushiobara and the Austrian Triathlon Federation signed an agreement regarding the Tokyo Olympics and Paralympics Pre-camp, under which Austrian triathletes came to Japan recently, and Florentine acted as an interpreter. "Although it was a short stay of just two or three days, the triathletes were touched by the rural scenery here and took lots of pictures. I, too, love this landscape and shoot videos that I send to my family."

Upon seeing these expansive scenes of nature, so unlike the cobbled streets of Vienna, Florentine's mother also loved the place. When Florentine describes the natural beauty of Nasushiobara, her love for the place is obvious: "During the rice planting season, the paddy fields reflect the surrounding mountains like mirrors, and in the fall, the rice plants shine golden as they undulate in the wind."

To mark the 150th anniversary



Florentine in a Austria's national costume, the *Dirndl*, at Aoki Elementary School while explaining about the charms of Austria.

of friendship between Japan and Austria in 2019, various projects are also being planned here. "I might get homesick if I were to go back home now. I'd like to stay a little more here," Florentine says. Smiling, she adds, "I would like to continue to work as a bridge between the two countries in the future." ✿



Beautiful sights of nature are everywhere. Florentine has taken countless photos.

About the Japan Exchange and Teaching (JET) Programme

The JET Programme began in 1987 with the goal of promoting grassroots international exchange between Japan and other nations, and is now one of the world's largest international exchange programs.

JET participants are placed in every region of Japan and work in one of three positions: assistant language teachers (ALTs), coordinators for international relations (CIRs), or sports exchange advisors (SEAs). In 2018, the JET Programme welcomed 5,528 participants, and currently there are more than 68,000 alumni from 73 countries living in all parts of the world.



The JET Programme official website
<http://jetprogramme.org/en/>

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