Vol.56

LITTERAE POPULI

A news magazine presented by Hokkaido University

Recent News from Hokkaido University

Litterae Populi

Litterae Populi is a bi-annual magazine with the latest news about Hokkaido University. Its name is Latin for "letters of the poplar trees".

Contents

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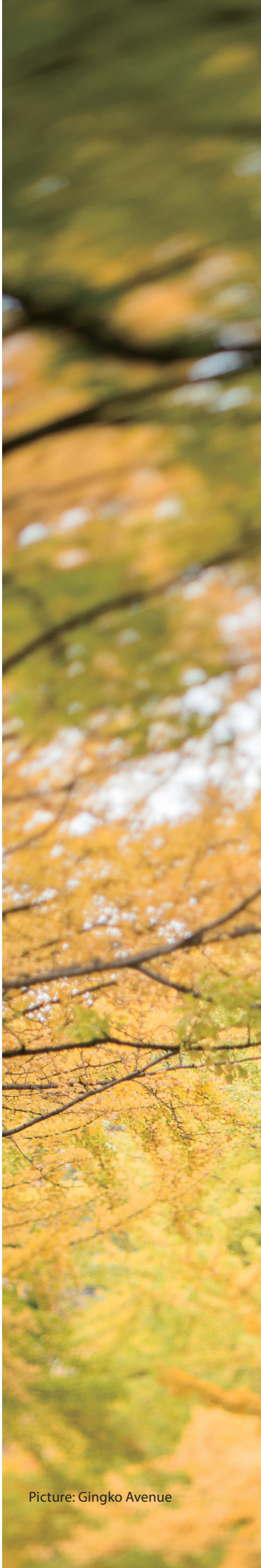


Picture: Gingko Avenue

Feature: Our Edges

Hokkaido University has developed a number of competitive characteristics or "edges" which have helped us grow into the university we are today. We look at these edges from a new angle while creating new ones. In this feature, we will tell you about three of the edges that make Hokkaido University unique.

Where Our

Feature:
Our Edges

Research Unique to Hokkaido University: Arctic Research Center

Research Happens

Photograph of the Northern Campus Area at our Sapporo Campus. Various research facilities can be found here, including our Creative Research Institution, which conducts research across all of our disciplines. In April 2015, we opened our Arctic Research Center, which is housed in the building of our Frontier Research Center for Post-genome Science and Technology. The unique curved building in the foreground to the left is our Center for Food and Medical Innovation, which opened in March of the same year.

Hokkaido University has steadily built up a wealth of unique research assets throughout the past 140 years. We systematically monitor research activities to match the needs of today's society, and endeavor to align the individual research activities undertaken at our university with our unique specializations.

Professor Hisayoshi Yurimoto in our Faculty of Science is conducting empirical research using an isotope microscopy system. Developed by Professor Yurimoto himself over a period of 20 years, the equipment makes it possible to learn about how the solar system and its moons came to be by comparing the isotopic ratios of meteorites and lunar rocks. In addition to discovering that the water on the moon was created by a comet, the system was used to analyze fine particles of the Itokawa asteroid that were brought back by the Hayabusa asteroid probe when it returned to earth in June 2010. The isotope microscopy system is an open facility that can be used by other scientists. Researchers from around the world have come to use the system, including those from NASA.

Creating an Edge from a Diverse Range of Research

How do you picture university research?

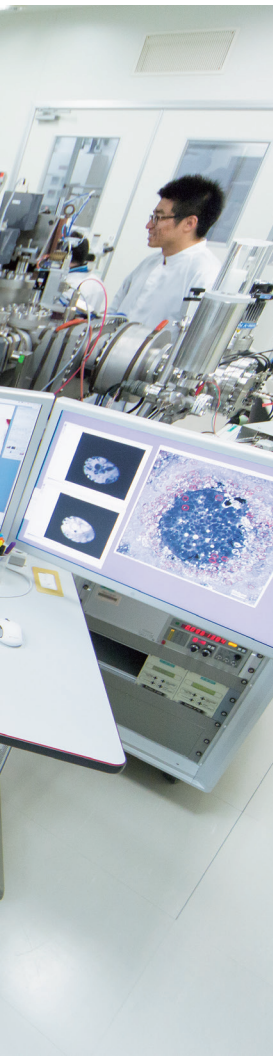
Perhaps you imagine scientists in white coats investigating unanswered questions, or maybe you imagine stoic scholars holding firm to their convictions as they push the boundaries of their field. The common thread between these images is the belief that researchers conduct individual research based on their own ideas, and in general this can indeed be described as true thus far.

University faculty members have produced many results through autonomous research activities, and Hokkaido University is no exception. Our faculty members have conducted a wide range of original studies, from Professor Ukichiro Nakaya, who studied snow crystals many years ago and once said that "snow is a letter from the heavens", to Professor Emeritus Akira Suzuki, who won the Nobel Prize in Chemistry in 2010 for his research on cross coupling reactions. Our most recent studies include research on zoonoses (infectious diseases that can be transmitted from animals to humans) and proton beam therapy.

This has led to empirical and field research in fields such as chemistry, life science, environmental science, materials science and energy. These studies have significantly contributed to prestige of Hokkaido University, showing it has a strong edge over other universities. We are now maintaining the fertile ground from which such studies grow, while also working on new initiatives.

Creating an edge over other universities

In recent years, there has been a call for universities to fulfill a variety of social responsibilities. This means that there are important facts to bear in mind when conducting research. Namely, as we carry out advanced research in a wide range of



fields, we must consider our research not only from an individual prespective but also factor in the needs of modern society so that our research can become even more relevant on a global scale. With this in mind, Hokkaido University has begun a new initiative in which research is systematically monitored to ensure it addresses these needs.

"There are a wide variety of studies scattered throughout this university that have a lot of hidden potential", explains Mr. Kazushige Kawabata, an Executive and Vice President of Hokkaido University, "instead of leaving it all up to the researchers, we are creating a systematic framework. We will build this into one of the pillars of our university and turn it into a major edge over other universities." The aim here is to support the autonomous studies of the researchers. while taking another step forward - assessing social issues, setting key themes and gathering related studies to create possibilities beyond the scope of an individual researcher's capabilities. In particular, this initiative is expected to promote the smooth and dynamic development of cross-disciplinary research and create solutions to current issues. Instead of the conventional bottom-up approach, this new initiative encourages an approach which seeks to resolve issues.

New keywords

"Health" is the keyword of one of our new initiatives.

The focus has been shifted from medicine, a keyword for research in the past, to health, a subject that has been given less of a focus in research. We have opened our International Center for Food and Medical Innovation as a center bringing together university faculty members who have worked on various relevant studies, from studies related to food to advanced medical research. It is also a place where members of industry, academia and government can come together with the public in various ways to create the societies of the future. With "together under one roof" as the key concept, the center carries on a tradition of food-related research that dates back to our days as Sapporo Agricultural College. The building was completed in the Northern Campus Area in March 2015, and is used to carry out research across the disciplines of food and medicine, centering on the home, to achieve healthy lifestyles.

We also set up our Arctic Research Center in April 2015 to further focus on research concerning the Arctic region. In recent years, the Arctic has become a global concern, but until now there has been no facility in Japan dedicated to Arctic research.

At Hokkaido University, faculty members from our Faculty of Environmental Earth Science as well as some from our Faculty of Fisheries Sciences, Faculty of Engineering, Institute of Low Temperature Science and Slavic-Eurasian Research Center, many of whom are Hokkaido University graduates, have carried out Arctic research from their various perspectives. In collaboration with the relevant faculty members, the center was established with the aim of making it a national center for Arctic research. The center carries out collaborative and cross-disciplinary research which transcends the boundaries between academic disciplines.

"In the future, we aim to pro-actively influence the key themes for a number of fields at Hokkaido University, such as those in agriculture and fisheries. We also aim to take the lead in ushering in positive changes to society", says Mr. Kawabata.

Changing our relationship with companies from collaborations to cooperations

In addition to promoting top-down research, we have designed an industry-creating course framework as a new initiative to branch out from old methods. Created in April 2014, this new system centers on the concepts of equal partnership and the sharing of goals and missions. This system goes beyond the conventional model of receiving funding from companies. Researchers from affiliated companies are permanently stationed in industry-creating courses in our graduate schools and institutes, where they cooperate with us in multi-organization industrialization research. As the university and the company are on equal footing, with both parties taking on the responsibilities and risks, the studies are taken more seriously.

The first industry-creating department was established in April 2014, and research is currently underway. The format of industry-academia research has changed from collaboration to cooperation.

Breaking the mold of research and opening new doors

Our promotion of top-down research and the establishment of our new course framework are initiatives which break the current mold of research. "Universities used to merely be a base for researchers. Now, universities must mobilize researchers collectively", says Mr. Kawabata. Mr. Kawabata believes that initiatives such as this will "break the mold of research". Research is shaped by the university, and this university is preparing for a new age.

Arctic Research Center

The Arctic has become a subject of global concern due to various issues that have surfaced in recent years. Awareness of the importance of this issue is growing in Japan, evidenced by Japan's Arctic Policy established last October.

One topic that is often addressed is the melting of the Arctic ice cap as a result of global warming. In addition to affecting the climate and ecosystem of the surrounding areas, this may affect the environment and ecosystems on a global scale due to its effects on the water and atmosphere cycles. Considering the potential effects on the fisheries industry and the occurrence of abnormal climate patterns, we will not be unaffected.

Meanwhile, we are also seeing advantages such as the development of new resources and the appearance of the Arctic passage due to the decrease in sea ice. These present political and economic issues of their own, proving that we are indeed facing many serious issues.

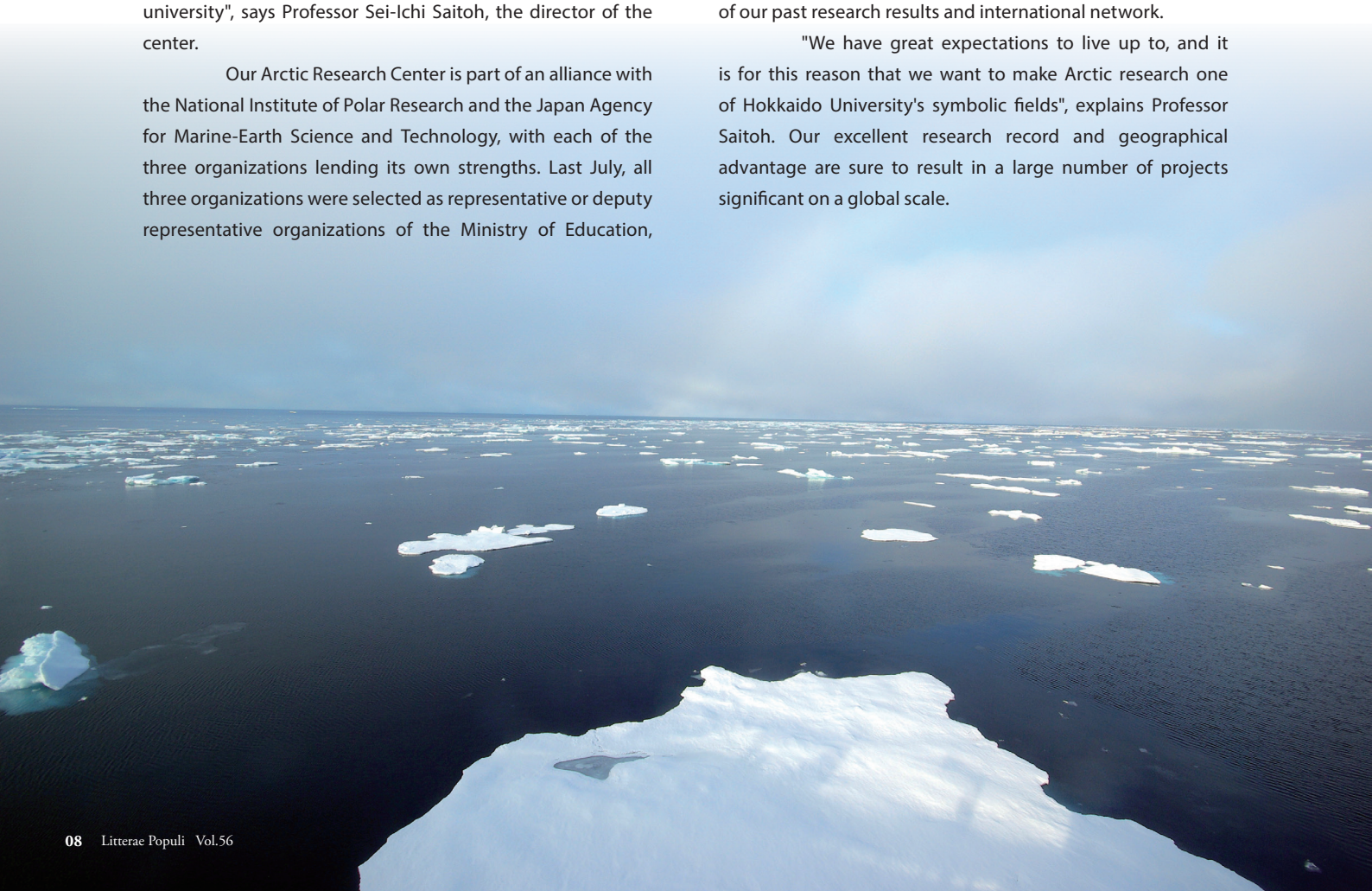
Our Arctic Research Center was opened in April 2015 to find solutions to these problems. The center is used as a hub for 22 science and humanities researchers who have conducted research about the Arctic. This encourages interdisciplinary approaches and aids initiatives to solve current problems. "This move is only natural when you consider our researchers' work and the fact that we are Japan's northernmost national university", says Professor Sei-Ichi Saitoh, the director of the center.

Our Arctic Research Center is part of an alliance with the National Institute of Polar Research and the Japan Agency for Marine-Earth Science and Technology, with each of the three organizations lending its own strengths. Last July, all three organizations were selected as representative or deputy representative organizations of the Ministry of Education, Culture, Sports, Science and Technology (MEXT)'s Arctic Challenge for Sustainability Project (ArCS). To further develop these strengths, we have applied to set up an Arctic research network center (J-ARC Net), a facility centering on MEXT's Joint Usage/Reserach Center (JURC) that will create a network between our three organizations.

There is a call for Hokkaido University to conduct general and trans-disciplinary research between the humanities and social sciences. "Various problems in the Arctic cannot be solved by natural sciences alone", explains Professor Saitoh, "general and trans-disciplinary research that includes the perspectives of humanities and social sciences is needed in order to solve issues such as interests between nations and the effects on the livelihood of the people who live in Arctic regions."

In March before the center was established, two interdisciplinary projects between the humantities and sciences led by Hokkaido University faculty members were selected by the Belmont Forum in its search for outstanding surveying and research projects for sustainability in the Arctic. The Belmont Forum is an international research support group that seeks to solve issues through collaborations between multiple countries. Ten studies from around the world were selected in this recruitment project. We were selected because of our past research results and international network.

"We have great expectations to live up to, and it is for this reason that we want to make Arctic research one of Hokkaido University's symbolic fields", explains Professor Saitoh. Our excellent research record and geographical advantage are sure to result in a large number of projects significant on a global scale.



Arctic Research Center

Our Arctic Research Center consists of a Research Division and a International Collaboration Division. The Research Division tackles various issues and comprises six research groups. It is staffed by faculty members from our Faculty of Environmental Earth Science, Faculty of Fisheries Sciences, Faculty of Engineering, Faculty of Science, Graduate School of Letters, Graduate School of Economics and Business Administration, Institute of Low Temperature Science, Slavic-Eurasian Research Center and Office of International Affairs.

Research Division

Atmosphere and Hydrosphere Research Group

This group studies the characteristics and dynamics of the currents and sea ice in the Arctic Ocean and its surrounding seas through boat based surveys and using seabed sonars. The group also uses their data to predict the effects these will have on climate change, and evaluates the effects that changes in the currents and sea ice will have on biota in the Arctic Sea.

Terrestrial Research Group

This group studies organisms from plants to large mammals, unique environmental features such as tundra and permafrost, and the interactions between the environment and the organisms that live in it in order to explore its biological systems and the effects on the environment. It also studies how volcanic eruptions and earthquakes occur, helping to prevent disasters.

Cryosphere Research Group

This group conducts research on glaciers and ice sheets in Arctic regions, particularly Greenland. In addition to direct surveys of the area, data from artificial satellites and numerical models are used to analyze changes and make future predictions.

Environmental Engineering Research Group

In addition to predicting the economic effects and environmental impact of using the Arctic passage, this group conducts extensive research on topics from large-scale structures such as harbors in extreme environmental conditions to the building of detached housing designed for cold regions (such as in Hokkaido).

Social Science and Humanities Research Group

This group evaluates the effects of climate change on the Arctic environment and usage of polar regions, and devises laws and frameworks to protect the environment. The group also studies the effect of environmental protection on the local population and starts initiatives with local stakeholders, including indigenous populations.

Satellite Observation and Modeling Research Group

This group develops real-time satellite observation and visualization methods and tackles big data science relating to the Arctic. It creates data assimilation systems using satellite data, engages in innovative research and development concerning models for predicting future phenomena and supports the sustainable development of the Arctic based on these future predictions.

International Collaboration Division

This division's research administrators (URA) coordinate joint research with overseas research institut.

International Research Projects at our Arctic Research Center

In March 2015, two of our international joint studies were selected by the Belmont Forum* in its search for outstanding surveying and research projects for sustainability in the Arctic. These projects have been primarily conducted at our Arctic Research Center since its opening.

Resilience and Adaptive Capacity of ARCTIC marine systems under a changing climate (RACArctic)

Representative: Professor Sei-Ichi Saitoh, Arctic Research Center <Joint Research with the University of Alaska (USA) and the Institute of Marine Research (Norway)>

This project aims towards a comprehesive understanding of how the environment is changing in Hokkaido and the surrounding Pacific and Atlantic areas, and how marine ecosystems are responding to these changes. We request the involvement of researchers in the social sciences, stakeholders such as fishery cooperatives, and distribution companies as we select the types of monitoring and surveys that are necessary and the areas where they are necessary. We also discuss the measures that need to be taken for future academic surveys to be conducted in the Arctic Ocean.

C budget of Ecosystems, Cities and Villages on Permafrost in the Eastern Russian Arctic (COPERA)

Representative: Professor Atsuko Sugimoto, Arctic Research Center <Joint Research with North-Eastern Federal University (Russia) and the University of Alaska (USA)>

This project takes place in the Arctic and taiga regions of Eastern Russia, where permafrost is covered with vast tundra and forests. The researchers survey the carbon content absorbed by natural ecosystems, the carbon content emitted by cities and settlements, the relationship between the two and reasons for changes in this relationship. They then turn the scientific data they have obtained into usable information and disclose it along with predictions of future changes. They also meet with parties such as regional and municipal governments to devise measures in which the research results can be used to improve the local population's quality of life.

*Belmont Forum
The Belmont Forum is a group of research support organizations and international scientific organizations in countries around the world that support research on global environmental changes. The forum aims to accelerate and deepen the environmental research required to eliminate major issues hampering the sustainability of human society by bringing together researchers through international joint projects and providing financial support.

A Theme Park for Forestry Researchers

Feature:
Our Edges

Field Research: Tomakomai Experimental Forest

Field research has been one of Hokkaido University's foremost areas of academic exploration since the time the university was founded. Researchers from around the world are now drawn to Hokkaido University because of its research environment.

Ever since we opened in Hokkaido as Sapporo Agricultural College, field work has been an essential part of our academic exploration. As our fields of study have broadened, Hokkaido University has set up farms, an orchard, experimental forests and aquatic research stations to conduct a wide range of field research. Not only have these facilities produced a wealth of intellectual property, our research environment has attracted researchers from around the world.

In the suburbs of Tomakomai, broad-leafed trees such as Mongolian oaks and painted maples grow together with conifers such as Yezo spruces and Sakhalin firs. There is a total of around 2,715 hectares of natural and planted forest. Tomakomai Experimental Forest is the base for various unique interdisciplinary studies.

An intricately linked, well-balanced ecosystem

The purpose of our field research in the experimental forest is to learn about the various facets of the food chain, matter cycle and ecosystem functions created by the flora and fauna of the forest. The forest is not merely the home of each individual organism; it is a place that has changed in dynamic ways as the various organisms have interacted with each other.

Tomakomai Experimental Forest stands on top of a layer of pumice and volcanic ash formed by the eruption of Mt. Tarumae around 330 years ago. The topsoil, which contains nutrients, is only 5-10cm thick, and around 80% of it (the topsoil) is thought to have been created by earthworms. The density of earthworms living here is an average of 10 times greater than that of other areas. The formation of this topsoil

Tomakomai Experimental Forest is one of our seven experimental forests. It is located near the suburbs of the industrial city of Tomakomai (population: around 170,000), with part of the forest open to the public. Many people in the area like to unwind by strolling through the forest or enjoying the vast expanse of colorful foliage in autumn.

Items from our Forest Museum, open to the public on the last Friday of every month (April to October).
Left: There are plenty of wood samples, as you would expect from a forest museum. The wood on the right is from a 302 year old Glehn's spruce.
Right: A stuffed Yezo deer. These deer are only found in Hokkaido. Our collection also includes red foxes and brown bears.

is complex, as is the relationship between the plants that grow in it and the animals that feed on them. To learn about this relationship, our researchers partition off topsoil around trees with steel sheets, remove the earthworms by hand and investigate the effect on the trees. This method is possible because the earthworms only live under the fallen leaves on the topsoil, not in the ground underneath. This is an example of research that is only possible in Tomakomai Experimental Forest.

Deer are pests that cause frequent problems here. When there is not enough food for them, they eat the bark off the trees. The layer just below the bark is used to transfer nutrients throughout the tree. If the bark all around the trunk is eaten, the tree dies. Populations of insects and small animals also decrease if undergrowth such as bamboo is eaten. This has been noted to cause issues such as the soil loosening and being washed away. Our researchers have fenced off one area of the forest and are conducting studies that compare the area with deer to the area without any. "But deer are not necessarily pests", says Professor Tsutom Hiura, Director of our Tomakomai Experimental Forest. The natural world remains in balance as long as there are only a certain number of deer. The food chain and matter cycle between organisms are more complicated than people imagine.

A research method developed by HU is now the standard

Observation is an integral part of field research. Trees can grow tens of meters high, and the area near the ground receives a different amount of sunlight and a different amount of water from the roots compared to the area at the top of the tree. This causes differences in the rate of photosynthesis, resulting in a variance in the size and thickness of the leaves. Ecosystems of organisms living in the tree, such as insects and birds, also differ, providing important information for research. To observe these features, Japan's only forest canopy observation gondola was set up in Tomakomai Experimental Forest.

Professor Hiura has been experimenting with new methods since 1993. An example is his jungle gym. Made of scaffolding between the trees, the jungle gym makes it easy to perform work in the trees. It is used to observe the processes that take place in the trees. Nobody had used a jungle gym for these observations before, but jungle gyms have become a standard observation method now as they are relatively simple to set up and use. What started as outdoor research equipment unique to Hokkaido University has spread to experimental forests throughout Japan, helping researchers nationwide.

Tomakomai Experimental Forest is visited by researchers from a variety of disciplines around the world, allowing them to network, come up with new ideas and start collaborative studies. Professor Hiura is pleased with our role as a hub for researchers. "[It is] because I myself have a wide range of interests", he explains.

Collaborations between researchers build connections between disciplines and nations, just as the interactions between organisms form ecosystems. This is one of the benefits of Hokkaido's nature-rich forest environment. Exchanges between people leads to new global research.

The world's fourth and Japan's only forest canopy observation gondola. It is 30m high with an arm length of 41.5m. It contains measurement equipment such as a carbon dioxide density meter.

The jungle gym developed by Hokkaido University. Located between the trees and built from pipes and couplings, the jungle gym makes it possible to observe right to the end of all of the branches from the upper trees to the lower ones.

Tomakomai Experimental Forest Website: https://tomakexpforest-e.jimdo.com/

A Festival Full of International Character

Feature:
Our Edges

Hokkaido University Festival

The Hokkaido University Festival is held in early June every year. As our largest event, this iconic start to the summer in Sapporo is popular among locals and tourists alike.

This year's Hokkaido University Festival was held at our Sapporo Campus over a four-day period from the 4th of June 4 to the 7th. This year marked the 57th Hokkaido University Festival, with 10 festivals organized by various classes, clubs, faculties, departments and international student groups taking place within our vast 1.77 million square meter campus.

Yuryo-sai festival was full of refreshment stalls and exhibits organized by the first-year classes in each faculty as well as by many clubs and organizations. The Science Festival, Medicine Exhibition, Health Sciences Festival, Dentistry Festival, Pharmaceutical Sciences Festival, Engineering Festival, Agriculture Festival and Veterinary Medicine Festival were held to show the unique characteristics of each faculty and department, and international students showcased and served their native cusine during our International Food Festival.

Learning about Various Cultures by Trying their Food

Our international students set up tents along the main street near the Hokkaido University Museum, where they served foods from around the world throughout the Hokkaido University Festival period. The stalls were planned and run by the international students themselves as a constituent festival called the International Food Festival (IFF).

Started in the 1990s, the IFF is now one of the most popular of the diverse range of regular events in the Hokkaido University Festival. For the 2015 IFF, 200 international students from around 40 countries ran 26 wildly popular stalls, giving

A stall representing Egypt, Morocco and India

visitors an opportunity to meet the international students while enjoying food from their countries.

The students manning the stalls teamed up with international students from their own country as well as from other countries (including Japanese students), creating a diverse group of participants. India, Indonesia, Thailand and Bangladesh were particularly well represented, with around 15 students running the stall for each of these countries. Many of the stalls were from Asian countries, as students from other Asian countries make up a significant proportion of our international students. However, there were also stalls representing Azerbaijan, Germany, Poland, Turkey and Egypt - making for a variety of colorful stalls.

The IFF is planned and run by the Hokkaido University International Student Association (HUISA). HUISA is a planning committee consisting of 10 international students elected by HU's international students every April. The committee encourages international students at Hokkaido University to support each other.

Alibay Mammadov, a doctoral student in the Graduate School of Letters and President of HUISA, was able to explain the key significance of the IFF: "It's good to see people trying food from various countries and learning about those countries' cultures." The Azerbaijan-born student led the planning committee for the 2015 IFF. Planning began with a recruitment process in April, after which the committee held a succession of meetings until immediately before the IFF was held, making thorough preparations so that everybody could enjoy the festival.

Many preparations needed to be made before the festival began, including careful arrangement of the stalls so that those with similar food would not be grouped together and the creation of a hygiene management system to prevent food poisoning. It was also important to take measures to avoid issues related to the running of the stalls. The stalls could only be represented by international students belonging to our graduate schools, and care was taken to keep restaurant operators out to protect the interests of the students. "Another purpose of the IFF is to help international students build skills by being involved in planning and running it", explains Mr. Mammadov. The hard work of many international students produces an event that shows how truly diverse Hokkaido University is. It also brings the international students and visitors together, fostering close international ties. The passion of the students and the excitement of the visitors made for a lively Hokkaido University Festival, and we expect that our students' wide variety of arrangements will draw many visitors to the elm forest again.

Above: The Main Street is lined with greenery and runs north to south across our Sapporo Campus. During the Hokkaido University Festival, a total of around 230 stalls line the street, drawing together both Sapporo locals and tourists.

Below: Alibay Mammadov, President of HUISA for the second year running. Mr. Mammadov ran a kebab stall at the IFF. "The stall was held in an Azerbaijani tent", he says, "some visitors visited multiple times in the same day, or multiple days running. I could see that not only was exchange taking place with the local people, a lot of international ties were also being formed between international students from different countries."

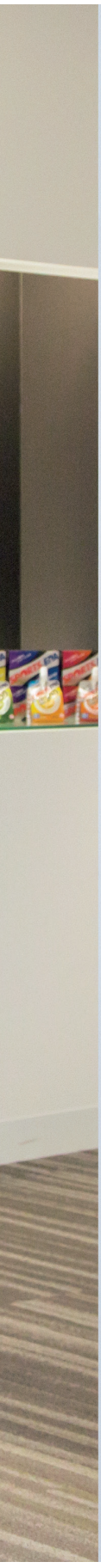
The Syrian and Mongolian international students worked together at this stall. The butter coffee was particularly amazing!

Many students were involved in the running of this big stall representing the Indian international students.

The stall representing the Arab countries

The Polish stall


焼きおにぎり
煮物



Guest

Norio Hosomi

President and CEO,
Nippon Suisan Kaisha, Ltd.

Nippon Suisan Kaisha (known affectionately as Nissui) is Japan's leading marine products company. Its president, Norio Hosomi, is an alumnus of Hokkaido University who has built numerous business ventures creating a wide range of value from marine resources. In this issue, we asked Mr. Hosomi about his memories of HU and his passion for his work.

Going the Extra Mile: Adding Value to Make a Product Original

"Sometimes you need to jump in the deep end."

–Takashi Mikami

Takashi Mikami,
Executive and Vice President, Hokkaido University

Takashi Mikami was born in Hokkaido in 1949. He has a doctorate in engineering, specializing in civil engineering. He received his bachelor's and master's degrees in civil engineering at Hokkaido University, and was then hired by Hokkaido University's School of Engineering as an Assistant Professor in 1974. In 1994, he became a Professor before eventually becoming the President of the School of Engineering and Graduate School of Engineering in 2006. He assumed his current position as Executive and Vice President of Hokkaido University in 2011. His motto is "go with the flow", and his hobby is gardening.

From a young boy who loved the sea to a young man studying fisheries sciences

"I come from Miyazu in Kyoto Prefecture. It's famous for the Amanohashidate sandbar. Since I grew up by the sea, I've loved the sea and fish since a young age. I chose Hokkaido University's School of Fisheries Sciences because I was drawn to Hokkaido. At the time, the school gave us a lot of freedom, and there was also a close relationship between us and the professors. We went to hot springs nearby together. At the time I entered the university, a student movement was happening there. There were no classes, so I spent all day playing mahjong in the dorm. That might have been part of the reason why I studied so hard when classes started. *(laughs)*

For my thesis, I studied the survival rate of E. coli in water. I investigated the rate at which E. coli decreases in isotonic sodium chloride solution. I also remember that professors often asked me to draw blood from rabbits in the laboratory. We had to stick a needle into the rabbit's heart and take a little blood. Because we were dealing with the live rabbits, it had to be done right or the rabbit would die. Whenever I was asked to do it, it felt so cruel, and I was always nervous about it.

I had planned on going to graduate school, but my father was killed in a car crash. I had to go back to Kyoto for around a month, and by the time I got back to the university most of the employment exams were over. One of the professors told me that I could still apply for Nissui, and recommended the company. This was how I began working at Nissui."

Learning the joys of the job through challenges

"The fisheries industry had hit its stride when I started working at Nissui, as the fishing industry in the northern seas was still thriving. My first job was to measure the level of mercury in their marine products at their central research laboratory. Mercury in tuna was a problem at that time, so I was checking it all day long. But it was during the five years that I worked here that I learned how interesting our work can be. At the time, Nissui had been using AF-2 as a synthetic disinfectant like other companies in the industry, but found out that it was suspected to be carcinogenic. We quickly began a project on how to maintain the same quality of preservation without using AF-2. I was part of the team for my experience in microbe research at the university, and the direction of the project depended on the research data I provided. It was very rewarding and interesting. We were the first to solve the problem, and to this day we have the top market share in fish sausages.

In my late 30s, I went to the US and worked with Unisea Foods for my experience in production and product development. At that time, we were producing and selling imitation crab meat in the US but it was not going well, and we started talking about withdrawing from the project. The CEO at the time said that some of our food products staff should go over there and thoroughly investigate the situation. Our mission was to rebuild Unisea Foods. A team of five of us spent four years

in Seattle from 1988, and managed to turn the company around so that it was making a modest profit by the time we returned to Japan.

At first I struggled with English. In meetings, everyone would all start talking at once and I wouldn't have a clue what they were saying. But after about two years in the US, speaking English came naturally to me. I recommend people should definitely go overseas if they get the chance. You can see things that are completely different from in Japan, or, can see Japan from the objective perspective points of view to the contrary. Living overseas teaches you a lot of things that you can't learn by being a tourist or staying for a short time."

Appreciating the bounties of nature and ensuring the safety and high quality of our food

"Nissui started a new mid-term management plan in 2015, with a focus on adding value. An example is our Buri yellowtail aquaculture. In nature, winter is Buri season. We approached this from the opposite perspective and developed aquaculture technology that would allow the early collection of eggs from the fish. This allows us to deliver "waka-Buri", providing delicious Buri even in summer. We have also succeeded in making the formula feed for adult tuna, and are making preparations to be able to deliver Bluefin tuna from a complete farming cycle by 2017.

Of course, food safety needs come first above all else. We have a quality assurance committee that meets once a month. We receive feedback from a third-party perspective, and some of this feedback can be harsh. However, by revealing everything and discussing it, quality improves. We are constantly taking this into account and I am confident that our foods have a high level of safety and quality as a result.

Nissui has five "genes" that are inherited since its foundation: mission, innovation, global hands-on approach, and customer orientation. I remember that Hokkaido University is built on a wonderful spirit as well - "be ambitious" and "be a gentleman". "Being a gentleman" is particularly important. I look forward to seeing upstanding graduates who break out of the box and follow their own path, led by strong convictions."

"The School of Fisheries Sciences gave us a lot of freedom, which I enjoyed."

–Norio Hosomi

Norio Hosomi,
President and CEO, Nippon Suisan Kaisha, Ltd.

Norio Hosomi was born in Kyoto Prefecture in 1950. After graduating from the Marine Food Science and Technology division at Hokkaido University's School of Fisheries Sciences, Mr. Hosomi began working for Nippon Suisan Kaisha (Nissui) in 1973. He worked in Seattle, USA, then went on to positions such as the manager of Nissui's processed food factory and the head of Nissui's food production department. In 2003, he became a director, supervising Nissui's fisheries and fine chemicals businesses before assuming his current position in 2012. His motto is "awareness comes only through practice". His hobbies are golf, fishing and photographing wild birds.

Refining Toxicology

Field-based Toxicology and Ecotoxicology

Mayumi Ishizuka,

Professor of Veterinary Medicine
Laboratory of Toxicology,
Hokkaido University Graduate School of Veterinary Medicine

Professor Ishizuka completed her doctorate in veterinary medicine at Hokkaido University. Her specialties are toxicology and ecotoxicology. She has been involved in research on environmental pollution at the National Institute for Environmental Studies, and joined Hokkaido University as an assistant in 2000. In 2010, she became the first female professor in the Graduate School of Veterinary Medicine. She has received honors such as the Hokkaido University President's Excellence Award, a prize given to researchers who have achieved outstanding results through their research activities. We can expect even more from this pioneering researcher in future.

The toxicology laboratory staff. Collaboration is very important to Professor Ishizuka, who believes that research cannot be done alone. She advises prospective researchers to become "someone who can deepen their research but also look around them."

Drawn to Poison, Controlling Poison

Talking about poison would make many people shudder. We are surrounded by toxic chemicals on a daily basis, but we consciously and unconsciously keep them away so that we can live safely. Professor Mayumi Ishizuka in our Graduate School of Veterinary Medicine studies poison and researches ways to control it. The field of toxicology is a relatively new field of study in Japan. It seeks to understand natural poisons and drugs, as well as the safety of various chemical substances.

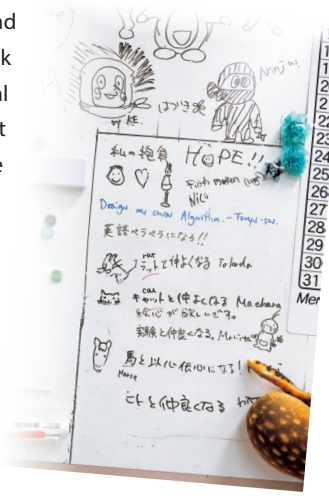
Professor Ishizuka became interested in toxicology when she encountered the floral egg crab (*atergatis floridus*) while studying at our Graduate School of Veterinary Medicine. Resembling a chestnut dumpling, this crab is found in the waters of Japan extending from Chiba Prefecture (near Tokyo) to the tropical islands of Okinawa in the south. Its muscles contain tetrodotoxin, the same toxin found in the famously poisonous fugu blowfish. Professor Ishizuka was intrigued by the way this crab was able to stay alive despite the deadly poison in its body.

Poison does not only come from living things. Poisons also exist in toxic man-made chemicals that are polluting the environment. However, being surrounded by poisons will not necessarily make an organism sick because of the defense mechanisms found in the body. This is the theme of Professor Ishizuka's research. "When we take cold medicine, for example", she explains, "the ingredients are flushed from the body in the urine after a certain period of time. The body removes toxic chemical substances by using enzymes to make them soluble in water."

In some cases, however, an organism's biological defense mechanisms become too strong. Super-rats are an example of this. Rat poison has been used to kill rats in cities, but 80% of rats in Tokyo area are now resistant to it. How did rats build up this resistance? Professor Ishizuka is working with the other staff at our toxicology laboratory to uncover the mysteries of this defense mechanism.

How Human Society has Changed the Environment

Professor Ishizuka is also tackling research in Africa to find out about the poisons people have made without realizing it. On her arrival in Zambia in 2007, she was asked to study mining pollution in the area. Although Zambia has a prolific copper mining industry, mining pollution has become a significant problem since the by-products of the mining activities pollute the area. Lead poisoning is also a serious problem. High concentrations of lead and cadmium have been found in livestock in Zambia's lead and zinc rich regions. This environmental problem is also a grim reality in other African countries, e.g., in Nigeria, where 400 children died from lead poisoning. In the case of Nigeria, lead poisoning had been discovered in livestock before their deaths, and on talking to local experts, Professor Ishizuka suggested that they might still be alive if appropriate environmental measures has been taken based on comprehensive information from various sources, including the veterinary field. Mining pollution was also caused by the Ashio Copper Mine in Japan. "We must not allow this mistake to happen again", exclaimed Professor Ishizuka. Professor Ishizuka started a symposium with African researchers in 2009 to ascertain the current situation in the area. The symposium is still being held to this day, with more than 10 countries now involved. To solve this problem, it is important to create scientific data on this toxin that is eating away at the people in places like Zambia and Nigeria and then raise awareness and educate people about countermeasures based on those results. We need to work on putting the environmental measures in place. Otherwise, the lessons Japan has learned about this pollution will go to waste.



The whiteboard on the door of Professor Ishizuka's room. It is covered with her students' drawings and resolutions.

Africa has a different social structure from Japan, and our team needs to work together with experts, officials and various other people to improve the environment. They are currently working with local authorities to find clues to the solution of this issue.

Professor Ishizuka says that her research in Africa is "rewarding work", and plans to continue working with the other staff at the laboratory to tackle the issue of combined pollution.

Relaxation

Frogs remind Professor Ishizuka why she started!

Professor Ishizuka's treasured amphibian goods. Most of them are gifts from students, friends, and acquaintances who know that she loves frogs and other amphibians. Professor Ishizuka has loved them since she was a child, and these goods inspire her to keep working on her research when she is busy with work or on overseas business trips.

An Inquisitive Mind and Frontier Spirit

Guest

Sadayuki Tsuchiya

Vice Minister of Education, Culture, Sports, Science and Technology

In this globalized world, universities are seeking to distinguish themselves and spread their wings. Sadayuki Tsuchiya, an alumnus of Hokkaido University, became the Vice Minister of Education, Culture, Sports, Science and Technology in August 2015. He and our President, Keizo Yamaguchi, talk about the frontiers of HU and the future of universities.

Keizo Yamaguchi: Congratulations on your appointment as Vice Minister.

Sadayuki Tsuchiya: Thank you. I've met you several times before, but this is the first time I've had a discussion with you.

Dr. Yamaguchi: So, you studied in our School of Engineering, didn't you?

Mr. Tsuchiya: Yes, I studied in the Civil Engineering division. I didn't get into university on my first try and had to reapply the following year. During that year, I read a political statement called the Nihon Retto Kaizoron (Remodeling the Japanese Archipelago). That was my light bulb moment. That was what inspired me to enter civil engineering. I'm the type of person who is immediately influenced by something that I think is good.

Dr. Yamaguchi: And then you studied at our new Graduate School of Environmental Earth Science after you graduated from the School of Engineering.

Mr. Tsuchiya: That's right. When I first started studying there, the school borrowed buildings from the School of Engineering, but later on we started having lectures at Furukawa Hall too. Furukawa Hall was very good. You can get outside by going out the window. *(laughs)* Right outside is a statue of William S. Clark. It really made me think what a great place I was studying at.

Dr. Yamaguchi: I bet you also enjoyed the Central Lawn. That's a popular place for people to relax, and it's an example of Hokkaido University's great environment.

Mr. Tsuchiya: It was very rich in nature, and that provided a fertile ground for free thinking. When it came time to apply for a job, the economy wasn't very good so I decided to just try whatever I could get. I took the civil service examination and visited someone who had graduated Hokkaido University before me. They were working at the Japan Science and Technology Agency, so I interviewed there and received an unofficial job offer. It may seem like I've led my life haphazardly, but everything I've done has been something that I felt was important and right for me.

Dr. Yamaguchi: Were there any events in your university days that made an impression on you?

Mr. Tsuchiya: As a student of one of the sciences, I was grouped together with all of the science students - engineering, science, pharmaceutical sciences, agriculture and veterinary medicine. That meant that my classes had students who thought about all kinds of things. In the year and a half before I

started classes in the School of Engineering, I was in classes with people who were interested in all kinds of things, and was discussing different topics with them all day. I think that as a result of this, it came naturally to me to explore a wide variety of approaches once I got out into the world and had to think of solutions to various issues.

Dr. Yamaguchi: This was back when our entrance examinations were not specific to particular divisions, wasn't it? In 2011, we started a general entrance exam system that works according to that system. I believe that this is one of the merits of our university. It's only for one year now, but I think that it's very stimulating for students to be able to spend time with people who have a wide variety of dreams and perspectives. There have also been cases where Hokkaido University's edge over its competitors has become apparent. In 2012, the Nikkei newspaper and Nikkei Human Resources conducted a joint survey of business people's level of satisfaction with the university they graduated from. Hokkaido University was ranked first, with a 100% satisfaction rate. All of the respondents replied that they were satisfied with us.

Mr. Tsuchiya: I would definitely give the same answer.

Dr. Yamaguchi: Hokkaido University is one of Japan's top universities - one could say that it's the best. Around 60% of our undergraduate students come from outside Hokkaido. The 40% from Hokkaido also includes many students from outside Sapporo who stay in student accommodation, so around 70-80% of our students are living away from home in accommodation near the university. I think that this distance from home leads to our students forming stronger bonds with other students and faculty members.

Mr. Tsuchiya: Another edge that Hokkaido University has is the diversity that comes from being a large general university. Hokkaido University seems to enjoy new things and give interesting things a try. It's also a very laid-back university, so its power comes out slowly and steadily rather than all at once.

Dr. Yamaguchi: To this day, elementary school students are familiar with William S. Clark's exhortation, "boys, be ambitious", and the students who come to us from outside Hokkaido seem to be drawn here by a similar ambition. For these people to leave their homes and come to Hokkaido, we must have inspired them a lot.

Mr. Tsuchiya: I have that impression as a graduate of Hokkaido University, but as a member of the Ministry of Education, Culture, Sports, Science and Technology, I don't think that your results are quite in step with your brand as a university that boldly takes on challenges. You have an image as a university with a great frontier spirit, but I would like to see you pursue new results that befit this and work on becoming less restrained in the way you develop your strengths.

Dr. Yamaguchi: Nitobe College, our new school opened in 2013, has attracted attention from universities all over Japan as a new venture. It is a unique program to produce graduates who can work in a global society, and is also distinct for its fellowship

Keizo Yamaguchi

President of Hokkaido University

Keizo Yamaguchi was born in Osaka Prefecture in 1951. He has a doctorate in science, specializing in differential geometry. He received a bachelor's degree from Kyoto University's School of Science and a master's degree from Nagoya University's Graduate School of Science before completing his doctorate at Kyoto University's Graduate School of Science. Dr. Yamaguchi began working at Hokkaido University in 1978 as an assistant in the School of Science. He went on to become a Professor in the School of Science in 1993 and then a Professor in the Graduate School of Science in 1995. He then worked in roles such as the President of the Graduate School of Science and Faculty of Science, Executive and Vice President before assuming his current role in April 2013.

system. Students in the program work as a fellow for graduates who are working in a global society. It's a powerful system that's very motivating for students in the college. We also want our students to challenge themselves in any way they can. The things we try do not always go well, and I think the students need to learn that through experience.

Mr. Tsuchiya: People need to experience failure. It helps people to grow. We need people to keep trying and not get discouraged the first time they fail.

Dr. Yamaguchi: We opened our International Center for Food and Medical Innovation in our Northern Campus Area. It's a place where members of industry, academia and government can come together with the public in various forms to create the societies of the future. Research is carried out across the disciplines of food and medicine, centering on the home, to achieve healthy lifestyles.

Mr. Tsuchiya: This is a very interesting initiative. You have made health a unified vision and are coming up with ways to develop solutions. You start by pursuing something interesting and then deal with the aspect of soundness second. *(laughs)* I would think that this way of creating new value would make use of perspectives and ideas from the arts, but Hokkaido University doesn't have any faculties for art fields, does it?

Dr. Yamaguchi: That's right, even though we have 12 faculties - more than any other national university in Japan - none of them are in art fields. As a general university, if we did have such a faculty, we would produce a different kind of graduate than before.

Mr. Tsuchiya: Your center for Arctic research is also an extremely good initiative, and reflects the unique characteristics of Hokkaido University. In any case, there are apparently many possibilities for Arctic research, and I look forward to hearing about new developments in the future.

Dr. Yamaguchi: You're talking about our Arctic Research Center, which we established in April 2015. The center carries out collaborative cross-disciplinary research to make active contributions to solving world-scale issues. We aim to make it a national center for Arctic research. Our collaborations with Russian and Finnish universities are also sowing new seeds.

Mr. Tsuchiya: Many Japanese universities are collaborating with universities in Southeast Asia. So, your collaborations with universities in cold regions are quite unusual.

Dr. Yamaguchi: I believe that the key is to think about how we can make use of our distinct characteristics as a general university in northern Japan to create a unique edge over our competitors.

Mr. Tsuchiya: You need to be the first to think of as many things as possible. Globalization is not just about how many international students you have or how many of your students study overseas. I think you need to be able to think strategically about which countries and regions you will collaborate with.

Dr. Yamaguchi: Finally, what message would you like to leave our students with?

Mr. Tsuchiya: They definitely need to put "be ambitious" into practice. I feel that that is something Japan is missing at the moment. I want the students to aim high and give their all to a variety of endeavors.

Sadayuki Tsuchiya

Vice Minister of Education, Culture, Sports, Science and Technology

Sadayuki Tsuchiya was born in Hiroshima Prefecture in 1953. After graduating from the Civil Engineering division at Hokkaido University's School of Engineering, Mr. Tsuchiya completed a master's degree in environmental planning at our Graduate School of Environmental Earth Science. He began working for the Japan Science and Technology Agency in 1979 and later served as the Director of the Japan Aerospace Exploration Agency's LA office and the Head of the Nuclear Fuel Division of the Atomic Energy Bureau. The Ministry of Education, Culture, Sports, Science and Technology, which Mr. Tsuchiya is currently the Vice Minister of, was established in 2001. Here, Mr. Tsuchiya worked in roles such as the Deputy Vice-Minister, the Director of the Science and Technology Policy Bureau and the Assistant Vice-Minister of Education, Culture, Sports, Science and Technology before assuming his current role in August 2015.

Hokkaido University Office Serves as an Information Center for Sub-Saharan Africans Seeking to Study in Japan

We have an office in Lusaka, Zambia. The Republic of Zambia is located in sub-Saharan Africa*, which has been a highly developing area as of late. Africa has attracted attention worldwide for its natural resources. However, there is a need to address the many issues affecting people in Africa and the African environment as a result of this development, an example of this is how to improve the quality of life there.

Hokkaido University has worked with the University of Zambia since the 1980s. Our involvement began when our Faculty of Veterinary Medicine took the lead in carrying out Japan International Cooperation Agency (JICA)'s Plan for Technological Cooperation in the University of Zambia's School of Veterinary Medicine. We helped to start a veterinary education program there that has constantly developed over the past 30 years. This cooperative relationship led to our Africa Office in Lusaka being set up at the University of Zambia. Students taught by Japanese faculty members have become faculty members themselves, and their students have become faculty members too, passing what they have learned down to each new generation. Hokkaido University still holds a place in the hearts of these faculty members, and we wanted to team up with them to create a new era.

We decided to place Study in Japan coordinators at our Africa Office in Lusaka for the Ministry of Education, Culture, Sports, Science and Technology (MEXT) as part of the Japanese government's "300,000 Foreign Students Plan". Furthermore, two new coordinators for Study in Japan (one associate professor and one lecturer) and one new administrative officer were also appointed. This office now serves as an information center, providing information on opportunities to study in Japan for sub-Saharan African people. Many African students have dreamed of visiting and studying in Japan because of its advanced technology, but have considered it out of their reach due to its distance from Africa. However, this office provides support to make Hokkaido University and other Japanese universities more easily accessible to these students, and is working on initiatives to bring outstanding African students to Japan.

A laboratory for our Research Center for Zoonosis Control was opened at the University of Zambia in 2007, providing a base for HU researchers to study infectious diseases in Africa. HU researchers are also working to improve the quality of life in sub-Saharan Africa, primarily in the field of sanitation engineering to provide clean water for people.

Lusaka is in the Southern Hemisphere, and during the time of this magazine's publication would have moved on from its cold, dry season into its hot, dry season. We hope that you, too, will visit Lusaka and experience "the real Africa". Marvel at the magnificent flora and fauna, meet the friendly locals and take the opportunity to think about the future development of Africa and ties between Africa and Japan in the future.

*The area of Africa to the south of the Sahara Desert.

Keiji Yamaguchi
Specially Appointed Associate Professor,
Africa Office in Lusaka, Zambia

Associate Professor Keiji Yamaguchi graduated from Hokkaido University's School of Veterinary Medicine. He has worked as a veterinarian both in Japan and overseas, and at one point taught in the School of Veterinary Medicine at the University of Zambia. He is now working as a coordinator for Study in Japan.

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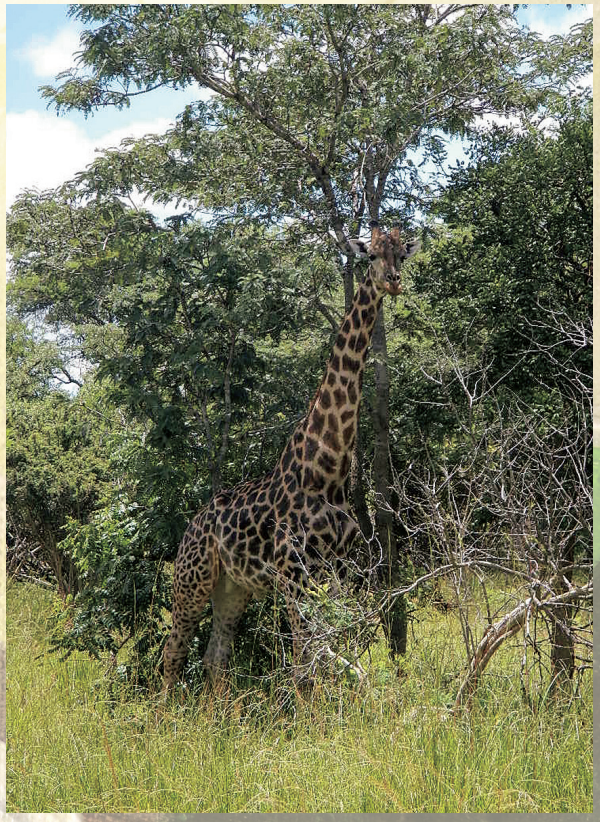

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1. Can you spot the giraffe in the bush?
2. Giraffes camouflage themselves so they cannot be seen from a distance.
3. Intersection on Church Road in the evening. You can also see a police officer controlling traffic.
4. Levy Junction Shopping Mall. This mall is packed with shoppers even during the workweek.

3

4

Succulent fruits and clear autumn skies

Photographer: Akihito Yamamoto

a

Our row of gingko trees lining Gingko Avenue was opened to the public on Sunday, October 25th, 2015. The first snow of the year began before dawn on that day. Those first flurries greeted 3,200 visitors, who strolled through a tunnel of bright golden leaves that shone in the sunlight on the crisp autumn day.

At the same time, the trees began to bear their autumn fruits in Yoichi Orchard (featured in 2014). Every year brings another great harvest throughout the orchard, with sweet, delicious apples, nashi pears, Japanese plums and grapes. The last fruits of the harvest are our Fuji apples, our slowest-growing fruits which ripen in the first week of November. After this week it is time to begin pruning the bare grape vines, and as the days become chillier, we will start preparing our vineyard for the winter.

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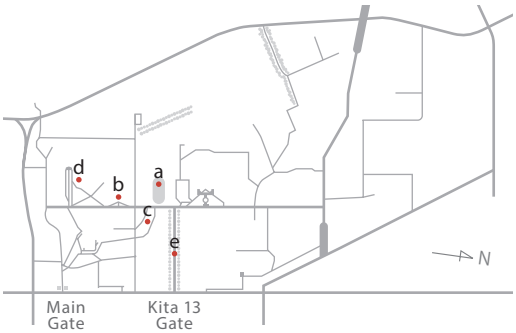

a . Ono Pond
b . The Hokkaido University Museum
c . Japanese archery facility
d . Former School of Agriculture Library
e . Gingko Avenue

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