Primates: the beginning

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Abstract

The journal *Primates* was founded by Kinji Imanishi (1902–1992) in 1957: It is the oldest and longest-running international primatology journal in the world. In this series of dialogues between Tetsuro Matsuzawa, Editor-in-Chief of *Primates* and the General Director of the Japan Monkey Centre (JMC) and Juichi Yamagiwa, former Editor-in-Chief of *Primates* and the Museum Director of the JMC, we look back at the achievements of our spiritual ancestors in primate research and talk about the back story of Imanishi and his fellow primatologists: founding the JMC as a research institute focused on primates and launching this journal. What was their motivation? What challenges did they face? What is their continued influence on the field right up to the present? What will be the legacy of our influence on the discipline?

Introduction: dialogue between an honorary ‘Gorilla’ and ‘Chimpanzee’

Tetsuro Matsuzawa

Last year, we celebrated the 60th anniversary of the journal *Primates*. This year is yet another landmark year: the 70th anniversary of the start of Japanese primatology as a whole. I would like to take this opportunity to reflect on what kinds of unique contributions Japanese primatologists have made among the international primatology community.

In this dialogue, let us focus on the period of history before the journal *Primates* was established—prior to 1957. What major events took place and why and how did we end up where we are today?

My first major at undergraduate level was Philosophy and I know that you majored in Science. We come from very different academic backgrounds, yet we ended up with our paths converging. I succeeded you as the Editor-in-Chief of *Primates*, and in my role as the President of the International Primatological Society I preceded the current president, Karen Strier. We are both graduates of Kyoto University, and both learned a great deal within Japanese primatology. You have been studying gorillas and I chimpanzees, both for decades (Fig. 1).

The message I often read in your books is that when you look at gorillas, you tend to become like a gorilla, think like a gorilla, in order to understand gorilla society. Perhaps that’s why you look like a gorilla (!)

Juichi Yamagiwa

You look like a chimpanzee, too. We now have a dialogue between a gorilla and a chimpanzee.

Fig. 1 Yamagiwa (right) and Matsuzawa (left) at the 50th anniversary of the Primate Research Institute of Kyoto University, held in Inuyama on June 1st, 2017. The photograph is a ‘selfie’ taken by Matsuzawa

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For me, participation is very important; this is the fundamental lesson that I learned from my mentor, Jun'ichiro Itani (1926–2001). He advised me to experience the goings-on and describe the interactions as if I were a monkey in the group, because a monkey has no ability to write a record of their daily life, therefore we the observers must do it.

I am now serving a term as the President of Kyoto University, from where Japanese primatology originated. The late Professor Kinji Imanishi of Kyoto University was both the founder of the journal *Primates* and the founder of Japanese primatology. But if you wish to consider the history of Japanese primatology, you must look back even further—to earlier influences before the beginning of Japanese primatology as a discipline.

The influence of Sven Hedin, Swedish explorer

Juichi Yamagiwa

Last December, 2017, we held an exhibition about Sven Hedin (1865–1952), the late Swedish explorer, who discovered an unknown lake in Central Asia (Fig. 2). After his exploration of Central Asia, he visited Japan in 1908, 110 years ago today. The Department of Literature at Kyoto University welcomed him. You will have heard of Konan Naito (1866–1934)—he was the leading authority at Kyoto University on the subject of East Asia. I think that Sven Hedin contributed to inspiring a spirit of exploration at Kyoto University. This was in 1908, when Imanishi was only 6 years old. Interestingly, Takeshiro Kanokogi (1874–1941), the director of Kansai Bijutsuin (the Kansai Art Institute), provided students with the use of his house in which to draw copies of Hedin's sketches. These sketches were later found and were presented at the exhibition. Later, Imanishi married Kanokogi's daughter. So, he will have learned of Hedin's Kyoto visit from Kanokogi.

Tetsuro Matsuzawa

I was familiar with the name Sven Hedin as the explorer who explored previously unknown areas of Central Asia on foot. He sought to locate the 'wandering lake' called Lop Nur and the ancient city called Loulan next to the desert area of Taklamakan. But I did not know that in 1908 Sven Hedin was at Kyoto University.

Even though at that time Imanishi was still only a little boy, Hedin's influence must have carried over into the future,

Fig. 2 Sven Hedin sketching the contours of the landscape of Inner Mongolia in 1934. Photograph taken by David Hummel and reproduced by permission of the Sven Hedin Foundation

and provided an atmosphere stimulating exploration in the youngsters of Kyoto University, motivating them to attempt the summits of untrodden peaks. Let me describe the tangible influence upon my own generation.

I own a book on the journeys of Sven Hedin, written in Japanese (Fig. 3). This book was the favorite book of my close friend, Shin'ichi Takagi (1949–1974). He owned a copy of his own and loved reading about Hedin's expeditions. He shared his dream with me of exploring unknown areas in Central Asia. Takagi and me joined the expedition that succeeded in the first ever ascent of Yalung Kang (Kanchenjunga West, 8505 m) in the Nepal Himalayas in 1973. Then, the following year, aged 25 years, Takagi made the first successful ascent of K12 (7428 m) in the Karakorum Himalayas of Central Asia. The pioneering work carried out by Hedin continues to inspire the young students of Kyoto University.

Fig. 3 The book on Sven Hedin that inspired the young Kyoto University alpinist, Shin'ichi Takagi, who carried out the successful first ascent of K12 (7428 m) in 1974. Photograph by Matsuzawa

Academic Alpine Club of Kyoto and pioneering endeavors at Kyoto University

Juichi Yamagiwa

The history of exploration continued with the founding of the Academic Alpine Club of Kyoto (AACK). Imanishi and his colleagues created AACK in 1931 when he was 29 years old. AACK is the original engine of Kyoto University's exploratory drive.

Do you remember how Imanishi, throughout his whole life, liked to retain a map of his travels? On this map, he drew in the route of wherever he trekked.

Tetsuro Matsuzawa

During his lifetime, from childhood right up to the end, he climbed more than 1500 mountains within Japan.

The AACK was created by alumni of the Alpine Club of Kyoto Imperial University (the current Kyoto University). The original members of the AACK included Kinji Imanishi, Eizaburo Nishibori (1903–1989), Takeo Kuwabara (1904–1988), Tsunahiko Shidei (1905–1979) among others (Fig. 4). Kuwabara was the third president, Imanishi was the fourth, and I am the fourteenth and current president of the AACK.

Eizaburo Nishibori was part of the first Antarctic expedition, the first Japanese person in Antarctica, he overwintered there 1957–1958. Kuwabara led the expedition to climb Chogolisa (7654 m) in the Karakorum Himalaya in 1958, the first ascent of a Himalayan mountain by a Kyoto University team. Imanishi, Nishibori, and Kuwabara

Fig. 4 March 1926: the young members of the Kyoto University Alpine Club (Imanishi, *second from left*, Nishibori, *far right*). Photograph reproduced by permission of the AACK

belonged to the same generation and were all members of the Alpine Club of Kyoto University.

Imanishi's gaze was directed outside of Japan, toward as yet unexplored areas—not only the highest mountains in the Himalayas but also unexplored areas such as Pohnpei Island in Micronesia and Daxinganling in Northern China. The motto of AACK is pioneering endeavors, in other words, the spirit of first ascents.

Juichi Yamagiwa

Challenging boundaries is the key point—not only the summits of the highest mountains but also exploring unknown territory in science. One should take the first step into the unknowns of the scientific world. Imanishi's exploration was always accompanied by scientists—exploration not only to reach unknown areas of the world but also to carry out scientific exploration. This has been a very important aim throughout Kyoto University's history.

Albert Einstein's tour guide

Tetsuro Matsuzawa

You pointed out the carryover influence of Sven Hedin's visit at Kyoto University and his interaction with the scholars there. It reminds me of another influential visitor from the West—Albert Einstein. Einstein visited Japan in 1922. He was in the midst of his sea voyage to Japan when he received the news that he had been awarded the Nobel Prize in Physics. He spent one and a half months touring Japan, giving talks in a wide variety of locations. I can easily imagine the excitement of the Japanese people. For the first time, a Nobel

Prize winner had arrived in Japan, and gave public lectures. I learned of this episode from Hideki Yukawa's autobiography (1907–1981), 'Tabibito' (The Traveler) (Yukawa 1960). It tells about his life from birth up until the age of 27, when he got the idea of the Meson Theory of nuclear forces that led to him winning the Nobel Prize in Physics in 1949. In this book, he mentions Einstein's trip to Japan. Yukawa was studying Physics at Kyoto University, and was a constant companion of Shin'ichiro Tomonaga (1906–1979) who was also awarded the Nobel Prize in Physics in 1965. Yukawa and Tomonaga were close friends of Shidei, also majoring in Physics, and they were just a few years younger than Imanishi, Nishibori, and others of that generation at Kyoto University.

Nishibori, one of the founding members of AACK, was 19 years old when he took the role of tour guide for Einstein in Kyoto for 3 days (Fig. 5). He had an elder brother who was a rich trader in Kyoto. The Ministry of Foreign Affairs asked Nishibori's brother to take care of Einstein during his stay in Kyoto. He delegated this role to his young brother, Eizaburo Nishibori (Matsuzawa and McGrew 2008).

I can easily imagine that spending 3 days with Einstein the Nobel Prize winner at the age of 19 years old must have strongly influenced Nishibori. He must have shared his

excitement with Kuwabara, Imanishi, and Shidei, the spiritual 'brothers' of the Kyoto University Alpine Club. Putting everything together into one key idea: you must be a pioneer; you must strive for new frontiers. This is likely to have been the strongest impact of Einstein's visit.

Juichi Yamagiwa

From that day to this, we have fostered many similar sorts of pioneering endeavors and also a 'frontier spirit'. Scholars and students of Kyoto University search for 'virgin peaks' to scale in science and in all other areas of academic study.

Tetsuro Matsuzawa

I agree. This kind of stimulating atmosphere endures at Kyoto University. Kyoto University really encourages freedom. This is what led to the contemporary Kyoto University Nobel Prize Winner Shinya Yamanaka (1962–); winner of the Nobel Prize in Physiology or Medicine in 2012 for the discovery that mature cells can be turned back into stem cells: iPS cells (induced pluripotent stem cells). We are very proud of the academic lineage of Nobel Prize winners here at Kyoto University—all of them sought to make new discoveries.

The world of living things

Juichi Yamagiwa

A similar type of frontier spirit is also evident in Japanese primatology, the discipline founded by Imanishi. In 1941, Imanishi published his seminal book, 'The World of Living Things' (Seibutsu no Sekai), in Japanese (Imanishi 1941). It had a huge impact on scholars and the general public in Japan. This book was unique among the contemporary literature. At that time, Western scholars held the opinion that society and culture belonged only to human beings, not to nonhuman animals, but Imanishi wrote in his book that society should be recognized in all living things.

The reason why Western scholars did not recognize society in nonhuman animals is because only humans can speak and use language, and they felt that society is based on language, which they assumed is linked to consciousness. Nonhuman animals don't use language, so how could they possibly recognize each other? Society was assumed to be based on the ability to recognize each other and to be constructed through shared perspectives, communicated among people through language. So, from their viewpoint, society and culture share a similar foundation. However, Imanishi was against such a conceptualization. Nonhuman animals can communicate with each other by means other than language. Imanishi started

Fig. 5 Nishibori and Einstein together in Kyoto in 1922. Nishibori was then 19 years old. He acted as guide for Einstein over 3 days. Photograph reproduced with permission of the AACK

out as an entomologist studying mayfly larvae. These larvae aggregate together; they recognize each other in different ways from human beings and coexist in a shared space. For Western scholars, language, culture, and society, they all exist on the same level, intrinsically connected.

Tetsuro Matsuzawa

So, not through language, but via a different means. It is very clear that there is communication among the members of a “society” in nonhuman animals. That is the crucial point that Imanishi was making.

Juichi Yamagiwa

Yes, so he wrote, if we recognize society in every kind of living thing—how do we expand such an imaginative viewpoint to relationships, individual relationships within a species, and the relationship between different species? We can recognize society, in which mutual recognition creates a sort of aggregation or collective—we can call this a society. Imanishi imagined holistic societies and species-specific societies in his book. Following the book’s publication, he sought to find evidence of society in nonhuman living things.

After writing his landmark book in 1941, during the Second World War, the Japanese government called him up to go to Mongolia.

Tetsuro Matsuzawa

But he was already in his 40s. Did Japan as a country really need someone of this age group as a soldier?

Juichi Yamagiwa

At that time, he proposed establishing the Northwestern Institute for the study of the northwestern area of China. He did not actually participate in the war, but was sent as a researcher to this institute with other scholars from Kyoto University, such as Sasuke Nakao (1916–1993) and Tadao Umesao (1920–2010), along with scholars from the University of Tokyo including, Eiichiro Ishida (1903–1968). They stayed there during wartime and came back to Japan just after the war was over, in 1945.

During his time in Mongolia, Imanishi became interested in the behavior of wild horses and revealing society in this species. He thought that the horse represented the best subject animal in which to study animal society, and after coming back to Japan, he tried to study semi-wild horses inhabiting the Toi Peninsula in Miyazaki prefecture (Kyushu).

In 1948, only 3 years after the end of the Second World War, the Japanese were very poor, and Kyoto University had no funds available for research.

Imanishi went to the Toi Peninsula with two of his students, Junichiro Itani (1926–2001) and Shunzo Kawamura (1924–2003), and they stayed in a very small travelers’ inn on the Toi Peninsula. My mentor, Jun’ichiro Itani, described the following episode. At that time, to fuel them for the whole day, only one o-nigiri (rice ball) was provided per person in the morning and they went out provisioned in this manner to search for wild horses. Of course, all of them were always very hungry.

The two students, Itani and Kawamura, would immediately eat their o-nigiri in the morning, but Imanishi did not eat his. At every lunchtime, Imanishi would slowly open the wrapping of his o-nigiri and eat it. He would appear very satisfied. The two students would, of course, be very hungry and would watch in envy as Imanishi ate.

Tetsuro Matsuzawa

Did Itani write this story down or tell it to you in person?

Juichi Yamagiwa

He wrote down this anecdote. At that time, the purpose of their exploration was to research free-ranging horses and to find evidence of society. First, they gave a name to each horse, to enable them to recognize each individually, and they recorded interactions between the named individuals.

Individual identification: a name for every individual

Tetsuro Matsuzawa

Well, it is well known that Japanese primatologists started to give names, not alphanumeric codes but names, to the monkeys they were observing. For example, names such as: Kaminari (“thunder” in Japanese), Jupiter, or Titan. I know that this is a well-established and important tradition within Japanese primatology. However, you just mentioned that Imanishi had previously given an individual name to each of the wild horses he studied in Mongolia, even before the study of wild monkeys in Japan. Did they use alphanumeric codes or ordinary names for each of the individual horses?

Juichi Yamagiwa

Ordinary names.

Tetsuro Matsuzawa

Really? Wow! Imanishi and his colleagues had already begun the study of wild horses in Mongolia. Furthermore, even back then, they were already giving individual names to their study subjects.

Juichi Yamagiwa

Imanishi continued with his method of naming individuals, and he got his inspiration from the literature of Ernest Thompson Seton (1860–1946). Seton started to write his famous animal books in 1891. During his childhood, Imanishi's favorite books to read were those of Seton.

Unfortunately, in the Western world, Seton was not famous as a scientist. I have asked many animal researchers in Europe and United States, but none of them know the scientist 'Seton'. Some people know him as a novelist. In a historical context, Seton has not been recognized as a scientist (he was a naturalist as well as a writer of fiction), but Imanishi and his students recognized that the method Seton described (Seton 1901) could be applied as a new scientific method. Imanishi wrote about this in his animal story, written in Japanese, 'Nihon Dobutsu Ki'. In his book, Imanishi described how they got a nod toward individual naming from Seton's book. They adopted this kind of method, yet carefully overcame the anthropomorphism by naming every single individual within each of the groups they studied. They gave a name to each and every individual and continued to make precise observations of the interactions among individuals over an extended period.

Tetsuro Matsuzawa

Conferring individual names is a medium through which one can come to understand each individual, meaning every single individual that makes up a given society. Imanishi avoided anthropomorphically interpreting the behaviors he observed. The behavior of every single individual was observed precisely and carefully described. This differs from Seton's approach—he focused on a few, recurring, named animal characters.

Juichi Yamagiwa

Indeed. Seton only gave a name to one or two animals in each of his stories, for example, in 'Lobo: the King of Cur-rumpaw', only Lobo the wolf and his 'wife' (Blanca) are given names; the other wolves have no names. This approach exaggerated the presence of a particular few special individuals, whereas Imanishi's method was to give names to all individuals.

Tetsuro Matsuzawa

Even the individuals living on the periphery of the group were given names, as well as all the youngsters—every single individual mattered. Imanishi and his colleagues were the first scientists to give names to every single individual in a group, in an attempt to understand "society".

The dawn of Japanese primatology

Juichi Yamagiwa

Imanishi initiated fieldwork in Japan with the study of wild horses. At that time in December 1948, Kawamura and Itani walked about the Toi Peninsula, they came across a group of wild Japanese monkeys, and they found this group to be far more complex and more highly integrated than the groupings they had observed in wild horses. They informed their professor, Imanishi. Okay, he said, let's go and see these monkeys, and so they visited Koshima Island to see the wild monkeys. This was on the 3rd of December in 1948 (Fig. 6).

Tetsuro Matsuzawa

Friday, the 3rd of December 1948, this is the day that Japanese primatology began, this is the day they visited Koshima Island to see wild Japanese monkeys. So, by inference, it follows that their first encounter with the wild monkeys of Toi Peninsula (that occurred while observing the wild horses) must have been some days before.

I thought Imanishi, Itani, and Kawamura—all of them—encountered the monkeys moving in the woods in the

Fig. 6 Imanishi (*middle*) started the study of wild Japanese monkeys on Koshima Island in 1948. He was aided by his students. Photograph taken by Itani in 1950 (Itani Jun'ichiro Archives)

evening, that is the image I had in my mind, but you say that only the two students watched the monkeys at the very beginning?

Juichi Yamagiwa

Indeed. Imanishi was not present at their first encounter with the monkeys. However, he followed up on his students' suggestions and decided to study Japanese monkeys on that day, Dec 3rd, so that day was the beginning of Japanese primatology.

In the initial period, Itani, Kawamura, and other scholars tried to follow the wild Japanese monkeys in their natural habitat. They visited many places to observe monkeys: from Shimokita at the northern limit of this species' distribution down to Yakushima Island, the southernmost limit. At that time, hunting pressures were very powerful. Japanese monkeys hid themselves deep within the forest, far into the mountains; they had developed a fear of humans. Imanishi and his students almost gave up on continuing their research in the wild. However, Koshima is an island, a very small island, thus the researchers were able to find and follow the monkeys easily. They decided to start provisioning them. Because visibility is very low in the forest, they called monkeys to the beach by provisioning them there—the beach there is a very open environment with little cover.

Tetsuro Matsuzawa

Do you know the origin of the idea to provision the monkeys? Where did the idea come from?

Juichi Yamagiwa

Yes, I can give you an answer. The idea of provisioning the monkeys apparently came from their experience of bird watching. Both Imanishi and Itani were biologists, naturalists really, and they had a wide range of knowledge about nature and how best to observe nonhuman animals, including wild birds. In the Japanese tradition of watching birds, provisioning is a 'royal road', the standard method to allow close-up views, and this convention was applied to Japanese monkeys. Moreover, provisioning wild animals, such as raccoon-dogs and foxes, has been very popular among Japanese people historically, as written about in various folktales.

The main purpose of their study was to understand monkey society, by analyzing the pattern of relationships between different individuals. So, visibility was the most important thing, being able to see their subjects. And not just to observe the behavior of a handful of individuals, but the behavior of all individuals in a troop and their interactions.

Tetsuro Matsuzawa

So, ethology is somehow always focused on what you can see, however, what they wanted to come to know was all the members of the society, because it is the society that matters and not the individual. For the early researchers, the individual was just a bridge to understanding society.

Juichi Yamagiwa

Before Japanese primatologists began their research, an American primatologist named Clarence Ray Carpenter (1906–1975), had already begun his fieldwork in South America and Asia. However, his method was to ask hunters to kill wild monkeys and then to cut open their stomachs to see what they had eaten. Japanese primatologists did not need such methods. They wanted to observe evidence of society. So they did not care about ecology, they did not care what the monkeys ate, or how many square kilometers they ranged over, no, they did not care about any of those things. Such aspects of monkey life were of no interest to Imanishi in the initial stages of his research.

Why society matters

Tetsuro Matsuzawa

Well, now let us go deep into what "society" is and why society matters. Imanishi focused on society because he strongly believed that there is society to be seen even in the bacteria found in all living organisms—society exists there for him. So, that is the powerful message from Imanishi—society belongs not only to humans but to all of the animal kingdom. In other words, individuals cannot live together without there being society.

Juichi Yamagiwa

The definitions outlined by Western scholars describe society in terms of highly visible aggregations, whereas Imanishi defined society in terms of less overtly visible examples of society. For example, consider dispersed solitary animals. Say that two solitary individuals encounter each other, they can communicate with each other and they recognize one another's presence: that forms another kind of society.

A group can produce several solitary individuals, but solitary individuals are also a sort of society. Let us reflect on a similar example relevant to human society. Say that your friend travels abroad. He/she still belongs to your society,

you can recognize them on their return, even though they are spatially distant from your society for a time.

It would be impossible to include all living things in a single feasible research plan, so Imanishi started out by focusing on a species of mammal phylogenetically close to human beings. He sought to spread his theory successfully, to find evidence for the existence of society in nonhuman animals, so he chose nonhuman mammal society. After first trying with wild horses, he found his subject—nonhuman primates, monkeys. Monkeys are morphologically and cognitively related to human beings.

Tetsuro Matsuzawa

This illustrates the advantage of primatology research in Japan. Japan is a biodiversity hotspot, much like the Congo Basin, Borneo, and the Amazon. Because of Japan's geographical position, we have a wide variety of endemic species, and one of these is Japanese monkeys. Japan represents the northern limit for the natural distribution of any species of nonhuman primates, but it's interesting that the monkeys were not the focus at the very beginning, but developed as a byproduct of observing Japanese wild horses. The researchers immediately recognized the importance of the monkeys and shifted focus accordingly.

Japanese monkey field sites

Juichi Yamagiwa

In August of 1952, they succeeded in provisioning Japanese monkeys for the first time, on Koshima Island and also at the Takasakiyama site.

Just before this was achieved, Itani and Kawamura visited Yakushima Island for the first time, in 1952. Nowadays, Yakushima is well known in Japan as the 'island of monkeys', and it is really easy to see monkeys there. But, back in the early 1950s, due to hunting pressures, it was very difficult to see any monkeys at all. They stayed on Yakushima Island for two whole weeks yet they caught a glimpse of Japanese monkey troops on only three occasions. Afterwards, they reported their impressions of these wild monkeys and guessed at their social structure, but their report was based largely on interviews with hunters on Yakushima Island. They estimated there to be a very high density of Japanese monkeys on the island, the majority undisturbed by human agriculture, instead living in their natural state.

During their stay on Yakushima, they heard that provisioning had been successful on Koshima Island (Fig. 7). So, they went immediately to Koshima to observe those monkeys. They did not return to Yakushima anytime soon,

Fig. 7 The provisioning of the Koshima monkeys was first achieved by Itani and Tokuda in August 1952. This is a photograph of the alpha male named "Kaminari", (Itani Jun'ichiro Archives)

and field studies of Yakushima monkeys were not resumed there until the 1970s. I imagine that if provisioning had been unsuccessful at that time on Koshima Island, Kawamura or Itani would most likely have decided to study the Yakushima monkeys instead in 1952.

Tetsuro Matsuzawa

So, on Yakushima Island, it was difficult to see monkeys at that time, but still they could expect the possibility of catching a glimpse. Currently, however, it is relatively easy to see Japanese monkeys on Yakushima Island and it is particularly charming to be able to see many neighboring troops there.

So, the most important thing for me about Imanishi's perspective is that it is far from the individualism of the West. That is, his focus was on society or groups, or even more on groups of different species. So, even now, it's a very 'hot' topic to see multiple troops of Japanese monkeys. What is a troop–troop encounter; what is represented by the meta-level of troop, i.e., regional groups?

At the time Kawamura and Itani saw the Yakushima monkeys, they already had in mind the scope of their research—to study groups, several groups at the same time. That is one of the motives that attracted them to Yakushima and is related to Imanishi's theoretical framework on the relationships among living organisms.

Juichi Yamagiwa

Itani and Kawamura tried to discover evidence of social relationships, within troops, between troops, and between species, just as Imanishi had postulated existing, and perhaps they should have chosen Yakushima as their main field site, and focus, because many troops are continuously distributed throughout the same area. But, fortunately or unfortunately,

they succeeded in provisioning the monkeys on Koshima Island.

So it was that they moved to Koshima and focused on a single troop. They studied social relationships only within troops, because Koshima and Takasakiyama are both geographically isolated, Koshima being a small island, and Takasakiyama surrounded by cultivated fields and human settlements. At that time, everywhere they looked on Japanese islands, they found only isolated populations of Japanese monkeys. Yakushima is an exceptional case representing previous, natural distribution patterns of Japanese monkeys.

Imanishi sent Itani to Takasakiyama; Itani stayed there to study the Takasakiyama monkeys. He drew up the proposed social structure of Japanese monkeys (Figs. 8, 9) based on his observation of a provisioned monkey population.

However, this structure was not applicable to truly wild Japanese monkeys in natural habitats, without any

Fig. 8 Itani bequeathed an archive of photographs, slides, and detailed field notes to us. The Primate Research Institute established visual archives of Imanishi's material. Itani left us detailed information, written in his own hand, on each photograph. For example, this is a photograph of Jupiter, alpha male of the Takasakiyama Troop in 1954 (Itani Jun'ichiro Archives)

Fig. 9 Photograph of Titan in 1961. He became the alpha male of the Takasakiyama Troop after Jupiter. According to the description on the photograph card, Jupiter was a particularly aggressive individual while Titan was more tolerant of others (Itani Jun'ichiro Archives)

provisioning. The Takasakiyama Troop is isolated from surrounding populations, so he thought that individuals must leave their natal troops to set out on their own. Being solitary is the only state outside troops. After birth, males gradually move to the periphery and leave the troop they were born into. Females on the other hand, do not leave their natal troops but stay to form alliances with their female kin. That was our initial understanding of Japanese monkey society. Itani's first diagram of the potential social structure of Japanese monkeys did not feature male transfer between troops.

Tetsuro Matsuzawa

This was because his proposal was based on the study of an isolated group. Therefore, he did not observe solitary males joining the troop from the outside. He did not see it happen. Is that so? This is most interesting.

Juichi Yamagiwa

Itani saw several solitary males, but they did not join the particular troop that he was observing. Provisioning was the main method used to enable the study of Japanese monkeys at the very beginning of fieldwork on this species. After Koshima and Takasakiyama, Japanese monkeys were also habituated via provisioning at Arashiyama, Jigokudani, and Minoo. In the 1970s, at least 37 provisioning sites appeared, right across Japan. However, the majority were not set up by researchers, but instead operated by travel agencies or public city councils seeking to attract tourists. Japanese monkeys became well known as a viable tourist attraction all over Japan.

Early findings at provisioned sites

Juichi Yamagiwa

Since the 1980s, the number of sites where monkeys are provisioned in Japan has decreased because provisioned monkeys caused problems for the human population: getting into agricultural fields to raid crops and entering shops and stealing things, and provisioning has another deleterious effect—it increases the birth rate and thus troop size, stimulating division into several groups, leading to an overall expansion of their distribution. However, through observation at provisioned sites during the first 10 years of research, the first two aims of Japanese primatology were achieved: learning about the social structure of Japanese monkeys and finding examples of preculture.

Tetsuro Matsuzawa

So, it's not just a few main characters that were given names, as in the animal story about 'Lobo' the wolf by Seton. Researchers gave a name to every single individual, so that they could get to know how monkey society works. Based on the behavior of each individual and their interactions with each other, they tried to understand the society, and the existence of such a society and these complex social interactions provides a firm foundation for social learning, the foundation of culture. So, we see society in nonhuman animals as well as 'preculture' or 'protoculture'—society and culture are both seen in nonhuman animals.

Juichi Yamagiwa

They found that monkey social structure was based on the following three factors: (1) linear dominant-subordinate hierarchy of ranks among monkeys; (2) kin relationships; and (3) leadership. That is: linear dominance ranks, from the

alpha male right down to the lowest rank; kin relationships; mother-daughter or matrilineal lineages. Each kin group shows a very rigid ranking system called 'Kawamura's law'. According to this law, the youngest sister is the next dominant below the mother and this youngest sister is dominant to her elder sisters (youngest ascendancy). Such a system results in clear dominance/subordinate relationships within and between kin groups. Leader alpha males usually occupy the central part of the troop's spatio-temporal distribution, then the sub-leaders, and young males stay on the periphery. The central core area includes mothers and infants and, in and around the core, all the female kin groups. This was the social structure as described by Itani, Kawamura, Kawai, and Tokuda, the four academic 'descendants' of Imanishi.

Another important finding was incest avoidance. Tokuda first found evidence of this in a captive, mixed-species group: rhesus and long-tailed monkeys housed in the Kyoto Municipal Zoo. Mothers and sons did not copulate with each other, and then Tokuda went to Koshima with Itani, and they found that not only mothers and sons but also brothers and sisters, grandmother, and grandchildren avoided intercopulation. Long-term studies with names given to each individual (individual identification) made it possible to uncover this phenomenon.

Tetsuro Matsuzawa

Incest avoidance is sometimes neglected when considering the initial discoveries, but it represents an important finding from the early days of Japanese primatology.

Juichi Yamagiwa

This was the most significant contribution to primatology through provisioning at the beginning of Japanese primatology: individual identification.

I think that without naming all the individuals, they would never have found out about the social structure or successfully identified precultural behaviors. I have described the history of Japanese primatology in more detail in some of my academic publications (Yamagiwa 2008, 2010a, 2010b, 2011, 2018).

Creation of the Japan Monkey Centre

Juichi Yamagiwa

Imanishi founded Japanese primatology and he was trying to organize a research center for primatology, whether external or internal to Kyoto University, because at that time he was an unpaid, voluntary lecturer at Kyoto University. He had no real job and no power.

However, it seems that he was very good at fundraising. This came from his experience as the principal organizer of expeditions to unexplored areas. To send groups of explorers and alpinists abroad, he needed to obtain funding. In the same way, he strove to collect finances to establish a primatology research institute.

Tetsuro Matsuzawa

To send Itani, Kawamura, Tokuda, and all the other young researchers to various places across Japan to continue the study of Japanese monkeys needed financial support and needed excellent planning and organization.

Juichi Yamagiwa

At that time, fortunately, an experimental primate research group had just been established at the University of Tokyo, in 1951. Imanishi built up a cooperation with them. In addition, the Meitetsu Railway Company aided Imanishi. The small city of Inuyama was chosen as the target location for the new institute. Before the Second World War, many monkeys could be found around Inuyama, but they disappeared during the war. The Meitetsu Railway Company told Imanishi that if he could create a monkey park that would attract tourists they would invest money. Imanishi agreed to their request and then invited the research group from the University of Tokyo to provide monkeys for experimental use.

Tetsuro Matsuzawa

Imanishi was the key person responsible for forming a connection between two major financial resources: the researchers at the University of Tokyo, and a very different channel—in fact an entirely different and somewhat unusual channel—a businessman near to Nagoya (a large city close to Inuyama). Imanishi had a friend, fellow Kyoto University graduate Motoo Tsuchikawa, working at the Meitetsu Railway Company. In this way, he was able to collect funding from both academic and business sources.

Imanishi worked out his own logistics to financially support scientific research: that is the crux of the matter. Not sourced from funding agencies, not from the Japanese government, not from the university—he himself created novel channels through which to support his own and colleagues' joint, pioneering, scientific research on nonhuman primates.

Juichi Yamagiwa

In other countries, field studies are usually separate from experimental research, but in Japan, the two have been integrally connected, with a close liaison between the two from the very beginning, with resulting mutual benefit. This was

possible mainly because we have indigenous monkeys here in Japan.

Imanishi succeeded in establishing the Japan Monkey Centre (JMC) in 1956, with the assistance of the railway company Meitetsu. The most important thing to note is that the JMC started out as an institute, not as a primate zoo. The primate zoo was created later on.

Tetsuro Matsuzawa

The JMC was founded on October 17, 1956. In 2014, we took over the management of the JMC from the Meitetsu Railway Company, and established a kind of NGO: a Public-Interest Incorporated Foundation. In this way, we have returned, almost, to the original initiative. Researchers founded the JMC as a research institute. From its very beginning, in the 1960s, we had curators with PhDs at the JMC.

The JMC is now run by Kyoto University Professors, including the former president of Kyoto University, Kazuo Oike, you (Yamagiwa), me (Matsuzawa), and Gen'ichi Idani (Itani), the son of the late great Itani; and Toshikazu Hasegawa, from the University of Tokyo (Fig. 10). It is a quite a unique organization. The museum part of the JMC was the second museum to be registered in the whole of Aichi prefecture (after Tokugawa Art Museum).

Juichi Yamagiwa

In 1959, Imanishi moved to take up the post of professor at Kyoto University, he was appointed first as a professor of the Institute for Humanities, then moved to the Faculty of

Fig. 10 The current JMC directors. The JMC is run by a group of university professors: *front left*, Juichi Yamagiwa; *front right*, Kazuo Oike; *back, from left to right*, Toshikazu Hasegawa, Gen'ichi Idani, and Tetsuro Matsuzawa. Photograph provided by the JMC

Science in 1962. He was the first professor in the Laboratory of Natural Anthropology. At that time, Imanishi appointed Itani (primatology) and Jiro Ikeda (physical anthropology) to be associate professors.

The Natural Anthropology program at Kyoto University was created by Imanishi. Next, the Human Evolution Studies course was created by Itani in 1981.

After Itani left the JMC, Masao Kawai (1924–) became the head of the research section. Kawai took a leading role in creating the primate zoo at the JMC. Itani started his field study career investigating hunter-gatherers, pastoralists, and slash-and-burn farmers in Africa, creating the discipline of Ecological Anthropology. Kawai moved to the Primate Research Institute of Kyoto University, established in 1967. Itani and Kawai were close friends, but they chose different paths.

Launch of the Journal *Primates*

Tetsuro Matsuzawa

Let us talk more about such matters in the next dialogue, in which we will focus on the period since 1958. To conclude our current conversation, shall we discuss the reasons why Imanishi began the journal *Primates*? The first issue was published in 1957 (Figs. 11, 12).

Fig. 11 The first issue of the journal *Primates*, published in 1957

Fig. 12 The first editorial board meeting of *Primates* in 1957. From left to right, Masao Kawai, Jun'ichiro Itani, Kinji Imanishi, and Taro Sonohara (1908–1982). Sonohara was a professor of Psychology at Kyoto University. Psychologists joined in the endeavor of Japanese primatology right from the outset (Itani Jun'ichiro Archives)

Juichi Yamagiwa

From 1954 to 1957, he edited the book series “Nihon Dobutsu Ki” (Japan animal story): four volumes written in Japanese. Before publishing his and his students' research results in English, Imanishi decided to publish the results of their fieldworks, in Japanese. For some years, he concentrated on writing in Japanese to reach the general public in Japan. He used this process to refine his ideas and to

Fig. 13 Imanishi and Itani in Africa, 6th March 1958 (Itani Jun'ichiro Archives)

Fig. 14 Imanishi and Clarence Carpenter: the latter holds the first ever issue of the journal *Primates*. Imanishi and Itani visited Carpenter on the way back from their first survey in Africa in 1958. Carpenter lost his son in the Second World War, yet still welcomed these two scholars from Japan (Itani Jun'ichiro Archives)

condense the essence of the findings into an academic article in English. Then, in order to spread their discoveries to the wider world, he needed the journal *Primates*.

Tetsuro Matsuzawa

In 1958, Imanishi and Itani first traveled to Africa to see gorillas (Fig. 13). They also visited primatologists in the Western world: Clarence Carpenter and Harry Harlow in North America, and Adolph Schultz in Europe (Fig. 14). Imanishi carried with him the first issue of the journal *Primates* as a gift to explain what they had found in Japanese monkeys—almost 10 years of accumulated research effort was condensed into that first issue of the journal *Primates*. I think Imanishi wanted this journal to explain everything he and his research team had achieved over the previous

decade. His joy at launching this journal and his ambition for its future are expressed in his Afterword. In the next dialogue, let us begin by talking about their expeditions to Africa in 1958.

To conclude this Editorial dialogue, please allow me to quote the Afterword of that first issue of *Primates*, written by Kinji Imanishi.

Afterword of Volume 1, Issue 1 *Primates* by Kinji Imanishi (The original text is Japanese—translation by Satoshi Hirata).

Currently, there is no journal that specializes in the discipline of primatology; I declare that this is the very first primatology journal. Isn't that incredibly exciting? First of all, currently, no primatology department exists in any university in the whole world, and therefore there is, as yet, no such thing as an academic society for the study of primatology. The break from the typical progression in the establishment of academic specialisms is evidenced by the fact that the Japan Monkey Centre (JMC) introduced the publication of this specialist journal, skipping the normal course of development, which first involves establishing a department at a university, followed by organizing an academic society, and only then publishing a journal. The term "primatology" can be translated as "reichourui-gaku" in Japanese, but we prefer not to use such a difficult, verbose name. The primatology that we envision is a new scholarly endeavor aimed at comprehensively investigating the genealogical history, so to speak, of humankind, by comparatively studying primates at in various phylogenetic levels, from the perspective of various academic fields, not only morphology and development (ontogeny), but also physiology, psychology, ecology, sociology, and so forth.

It is from this standpoint that we conceived the idea of gathering various primate species from around the world into a zoo that it is expected will be built under the supervision of the JMC; we do not wish to carelessly or recklessly expand our research focus to include animals that do not share recent common genealogy with humankind. In this first volume, only articles that are based on naturalistic observations of Japanese monkeys could be included, but this journal seeks to gradually fulfill all the aforementioned aims. On the other hand, I request contributions from outside the country and the international promotion of the journal, until it achieves global recognition. I might have made too many irresponsible remarks, but I just want things to proceed in a lively manner, anticipating a bright future for us in this field. I therefore ask you sincerely for your support and cooperation.

Kinji Imanishi October 25, 1957

(Imanishi 1957)

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