

Editorial Postscript

■ Never having been to Ethiopia, I was given these documents and started going over them in October, 2018. Apparently, they had something to do with Professor Kimura, someone I would see sometimes on campus but knew little about. I remember feeling at a loss on how I should parse through the countless slides and documents. But over the course of going through everything, I became absorbed in the process of connecting each document together—how the beautiful hand-drawn maps correspond with meticulous detail to the list of villages, where patients were found, how many vaccinations were given, where the photos were taken, and so on. Before long I dreamed of wandering in northern Ethiopia searching for smallpox patients.



The eradication of smallpox is a great historical achievement, but there are few records that show how the search for and vaccination of patients unfolded in the field. Being able to reaffirm the importance of real, backbreaking work on the ground from these priceless documents was a valuable

Dr. Eisaku Kimura (foreground) talks with Tomomi Igari. The interview with Dr. Kimura was conducted in April 2019 at Sakai Liquor shop and Daihachi Yakitori Diner in Nagasaki City. Dr. Kimura is a regular customer at both.

experience for me. “I wonder what Ethiopia is like now?” said Professor Kimura under his breath once during an interview, who has not set foot in the country since then. For me, I have made it a goal to definitely go to Ethiopia someday. (Tomomi Igari)

■ I first met Eisaku Kimura in Autumn of 2017. I was having a drink with my colleague Professor Kazuhiko Moji at a nearby yakitori restaurant called Daihachi, and Kimura joined us later. “Oh really? You went to Ethiopia? I used to work in Ethiopia too, you know,” he said, after which he recounted his experiences searching for smallpox patients and talked excitedly about finding a steam locomotive in the mountains (see page 11), and eventually I took charge of the slides and documents he had saved.

I presented the documents at a poster session at a Japan Association for Nilo-Ethiopian Studies conference in the spring of 2018, hoping that a researcher would volunteer to carefully examine them. Many members asked questions and offered comments and advice, but no one asked for the documents. “This is more history of global health. Since it’s Ethiopia, Masuda should do it,” someone finally suggested.

Fortunately, Tomomi Igari had been working at my office since last October, so I asked her to parse through Kimura’s documents as part of her job. Completion of this Special Eisaku Kimura Issue is entirely thanks to Igari struggling through these documents for six months.

In the field of global health, smallpox is a disease that has been taken care of, but surprisingly few know about how the workers on the front lines executed such a huge, global project out in the field. The next thing I want to do is think about how to make the information we were not able to include in this issue publicly available. (Ken Masuda)

Tomomi Igari

Tomomi Igari was born in Tokyo. After graduating from Toyo University with a degree in sociology, she worked in community development (particularly in the area of school health) in the West African country of Benin. Upon returning to Japan, Igari joined the Tokyo Council of Social Welfare. Soon after, she worked as a staff member at the Embassy of Japan in Benin from 2013 to 2016. From 2016 to 2018 she studied at Nagasaki University’s School of Tropical Medicine and Global Health and obtained a Master of Public Health degree. Her master’s thesis was titled “A Descriptive Study of Treatment Seeking Among Buruli Ulcer Patients in Southern Benin.” Since 2018, she has worked for my research lab as an assistant at Nagasaki University, and she currently works at the Embassy of Japan in Madagascar.

Ken Masuda

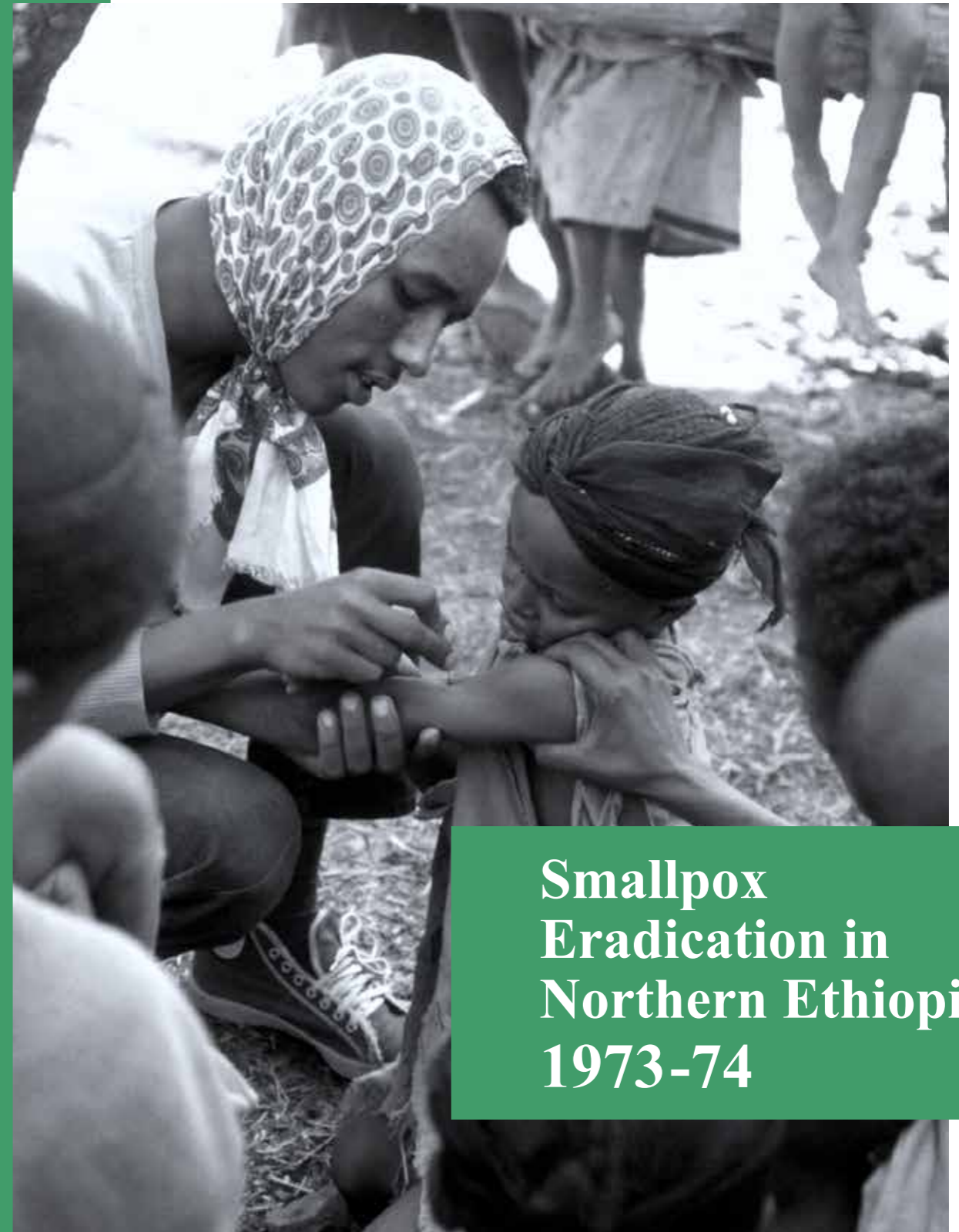
Born in Kanagawa Prefecture in 1968, Ken Masuda is an associate professor at Nagasaki University’s School of Global Humanities and Social Sciences and School of Tropical Medicine and Global Health. He completed a graduate programme at Tokyo Metropolitan University. In 1993, Masuda started researching the Banna people, Omoti farmers in Southern Ethiopia, and obtained a doctoral degree in 2003 (PhD in Social Anthropology). His doctoral dissertation was titled “‘Periphery’ as Identity: Modern Narratives in Southern Ethiopia.” Masuda’s current research themes are the future increase of aged population and social welfare in East Africa, the sustainability of communities in Nagasaki and Hiroshima, and the global distribution of Japanese-made tiles.

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Dr. Eisaku Kimura



Smallpox Eradication in Northern Ethiopia, 1973-74

Tomomi Igari & Ken Masuda (eds.)

Containing Smallpox

Who Is Eisaku Kimura?

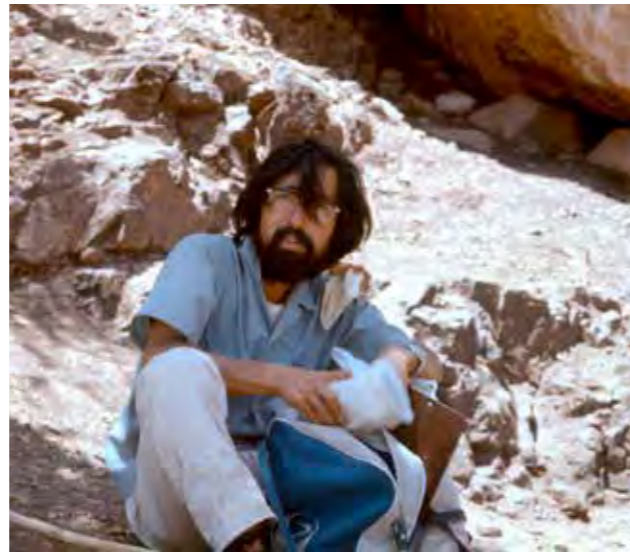
Dr. Eisaku Kimura (born in 1946 in Akita Prefecture, Japan) is a parasitologist. He taught at Aichi Medical University until 2012, and then he served as a specially appointed professor at the Osaka University Research Institute for Microbial Diseases. Today he conducts research at Nagasaki University.

When working at Nagasaki University Institute of Tropical Medicine's Department of Internal Medicine in the early 1970s, he was selected to travel to Ethiopia as a specialist for the former Overseas Technology Cooperation Agency (or OTCA, a precursor of Japan International Cooperation Agency: JICA). At the time, the World Health Organization (WHO) Smallpox Eradication Programme (1966–1980) was focusing efforts on finding and vaccinating patients in Ethiopia, one of the last few remaining infected areas in the world, and Kimura's job was to search villages with a fine-tooth comb to find patients, vaccinate them, and report the results.

What Is Smallpox?

Smallpox is an infectious disease caused by the variola virus. It is highly contagious and can spread by droplet and airborne transmission. Due to its high case fatality rate, the disease has been feared since before the common era, and there have even been outbreaks in Japan. Historical records show that a great many people have died from smallpox throughout history.

In 1980, WHO declared that smallpox had been eradicated from the world. Today it no longer exists in nature, although there are still stockpiles of the vaccine. The last smallpox patient to contract the disease through natural infection in the world was discovered in Ethiopia's neighboring country of Somalia in 1977.



WHO Smallpox Eradication Program

But how was smallpox eradicated? To tackle the worldwide smallpox epidemic, in 1958 the World Health Assembly passed a resolution to undertake a Smallpox Eradication Program and began taking measures against the disease. However, smallpox continued to run rampant in Sub-Saharan Africa, Southeast Asia, Brazil, and other regions, so in 1966 WHO passed a resolution to undertake a 10-year smallpox eradication program, which was first implemented in 1967. As part of the resolution, an additional allocation of expenses for eradication measures was approved and an urgent appeal was made to WHO member states to move forward with the plan. At the time, there were 31 countries in which the disease was endemic, 15 countries with cases of imported smallpox, and 10–15 million new cases and 2 million deaths per year.

The initial policy for the 10-year plan was to vaccinate at least 80% of the population in areas in which smallpox was endemic by sending out vaccination teams and vaccinating people haphazardly in 3 years. However, several things became clear over the course of implementing this policy: the number of cases did not decrease as expected even though the vaccination rate increased; an epidemiological survey in West Africa revealed that the spread of smallpox advanced gradually after the incubation period (at an average of 12 days); people were being infected by those close to them, such as family; and the morbidity rate of unvaccinated people in close contact with infected family members and others was a relatively low infection rate of 40%. Therefore, the policy was changed to a “**surveillance and containment**” strategy consisting of finding patients and vaccinating those around them, which achieved global success.

When Kimura joined the program in 1973, there were smallpox cases in 13 countries (endemic countries: Ethiopia, Botswana, India, Pakistan, Bangladesh, and Nepal; imported infection: Afghanistan, Somalia, Djibouti, Bhutan, Kenya, the UK; and Japan). Among these countries, cases were still appearing in Ethiopia—along with Somalia, Bangladesh, and others—until the very end of the program.

Smallpox Eradication Program in Ethiopia

The smallpox eradication program in Ethiopia started in 1971, later than in any other country. The reason for the delay was that at the time Ethiopia had other higher priority programs in place two which resources needed to be allocated, such as a malaria eradication program implemented with the aid of external donors and the establishment of local health organizations.

When the Ethiopia smallpox eradication program started, it consisted of only a small 39-person team with a limited number of vehicles. Therefore, only four provinces were covered at first.



Ethiopia in 1973

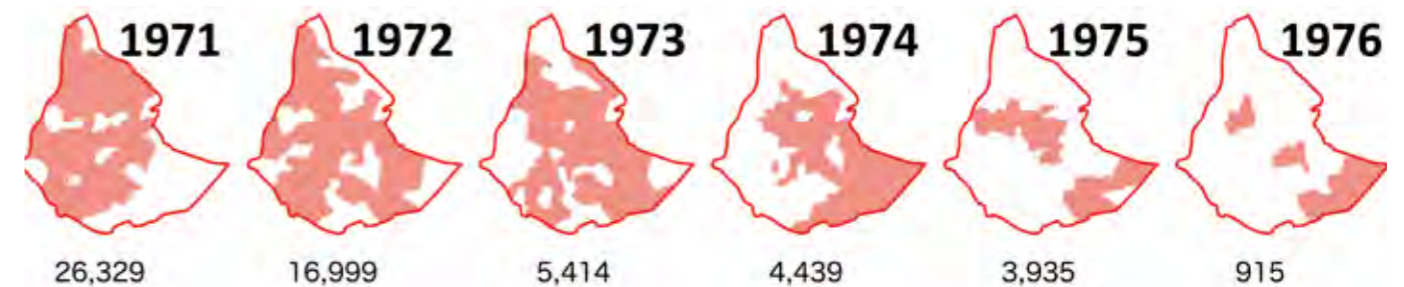
When Kimura joined the program in 1973, Ethiopia was in the middle of the program's active phase, and the number of reported smallpox cases had been successfully reduced compared to the previous year. Reports of cases in the southwestern Ethiopia had stopped, so people and resources were moved to the harder-to-access highlands and mountainous areas of Gondar, GojamGojjam, and Wollo. Many people were opposed to vaccinations in these

Using a surveillance-and-containment strategy, search teams of one or two people spread out and searched for patients on foot. One distinctive feature of the smallpox eradication program in Ethiopia was that foreign volunteers were employed. The US Peace Corps, Austrian volunteers, and Japan Overseas Cooperation Volunteers (JOCV) served as surveillance officers to find and vaccinate smallpox patients. Walking throughout mountainous areas accessible only on foot, they worked diligently to find patients while facing hardships such as hunger and guerilla fighters.

The last smallpox case in Ethiopia was found in the southwestern province of Bale in 1976. WHO declared smallpox eradicated in Ethiopia in 1979.

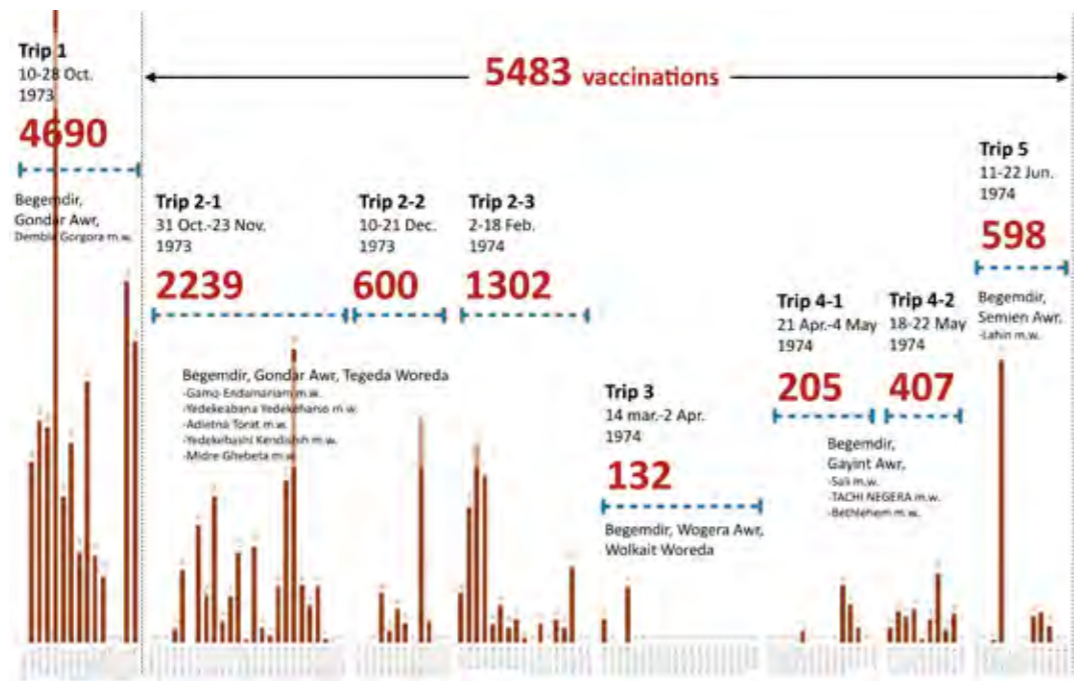
areas, as evident by factors such as the fact that people there still performed the traditional practice of smallpox variolation (see page 13 for details).

Kimura worked in several awraja (“sub-provinces”) in Gondar province for about one and a half years. Based on his documents, Kimura and his team's expeditions can be divided broadly into five trips. Smallpox cases were reported until the very end. Due in part to the difficulty of accessing the areas, later helicopters were used to find and vaccinate patients, a method referred to as “Operation Crocodile.”



Changes in Smallpox Prevalence from 1971 to 1976. The last patient was a small girl from a nomadic group, found in Bale Province on August 9, 1976. No smallpox patient has been identified in Ethiopia since, and the WHO declared that smallpox has been eradicated in the country in 1979. The figure here is from a 1979 WHO report.

Thousands Upon Thousands of Vaccinations



The following graph was created based on the number of vaccinations discerned from the records kept by Kimura, such as his journal. Based on just these records alone, Kimura and his team administered over 10,000 vaccinations from October 1973 to June 1974. Most vaccinations were administered during the training trip (about three weeks)—a total of 4,681. Although no detailed records remain of the vaccination plan, they apparently visited locations such as schools, churches, and marketplaces, and

then searched for and vaccinated patients by showing people photos of smallpox patients. Since they used the method of finding patients and vaccinating those around them, on some trips, such as Trip 3, they did not vaccinate many. But over the course of the eight-odd months Kimura led the exhibitions, the total number of vaccinations increased to 5,483. This is an extraordinary number considering the fact that they had to travel on foot in an environment that varied in elevation and was high above sea level.

Japanese People Involved in Containing Smallpox in Ethiopia

WHO documents list the names of 27 Japanese people who participated in the smallpox eradication programme. One of them was Kimura. The list also includes the name Isao Arita, a medical officer in the program who later became head of the Smallpox Eradication Unit. Most of the names were of Japan Overseas Cooperation Volunteers dispatched to the Smallpox Eradication Project by the Overseas Technology Cooperation Agency (or OTCA, a precursor of JICA).

The project consisted of sending two sets of volunteers for one instance each over four years starting in 1972 and ending with the eradication of the disease. They engaged in work such as surveillance, much like Kimura, and maintaining vehicles.

Kimura joined the volunteers on trips to search for patients, and on their days off they would get together to enjoy a moment of rest and unwind.

The smallpox eradication declaration signed by members of the Smallpox Eradication Committee included the signature of only one Japanese person: Isamu Tagaya (head of the National Institute of Health's Department of Enteroviruses at the time).



Volunteer staff members share a meal. Mr. Takahashi (left) was working with Dr. Kimura on smallpox eradication, and Mr. Kanome (center) was a ceramic artist.



Japanese members pose with local residents. On the right is Mr. Inaba from OCTA.

Countless Valuable Documents

Kimura kept and saved a wide variety of records—from publicly available reports to a private journal. We have been gradually organizing them as we have been receiving them since 2017. The records we have received so far, categorized by type, are as follows.

1. Hand-drawn maps (drawn up based on first-hand visits, information from local governors, etc.): 8
2. List of villages (corresponding to the hand-drawn maps): 17
3. Daily Work summary (daily itinerary stating places he visited, numbers of cases and vaccinations, and notes on other occurrences): 16 (However, there are only rough notes for Trip 1)
4. Monthly summary (summaries of the circumstances of each trip): 17 (Trips 2, 3, 4, and 5)
5. Household Surveillance record: 19 (Trips 4 and 5)
6. Slides (photos of smallpox and other skin diseases, scenery from traveling, festivals, etc.): thousands, 627 of which have been digitized
7. Field notebook: 1 (record of April to June 1974 written mainly in Japanese; includes drafts of maps)
8. Notebook: 1 (record of 1973)
9. Papers on smallpox variolation: 20-page paper in Japanese, 60-page paper in English
10. Reports issued by WHO (Smallpox Eradication in Ethiopia, Smallpox Surveillance in Ethiopia 29 [Monthly Report, June 1973]): 1 each
11. Other notes: several pages

The Daily work summary and monthly summary were written to be submitted to the Smallpox Eradication Programme. The former state his daily itinerary and numbers of smallpox cases and vaccinations.

The Household Surveillance Record are forms for recording information about patients that were found. They provide information on how the patients were found, the first patient in a given household (name, gender, age, whether he or she had a vaccination scar, date of vaccination, whether he or she had been variolated, date of variolation), the day smallpox symptoms started, whether the patient had been alive, infection route, and information about other household members.

There are an incredibly large number of slides—627 have been digitized, but the actual number is nearly three times that. Taken by Kimura, the photos portray not only patients with smallpox and other skin diseases, but scenes of life in Northern Ethiopia at



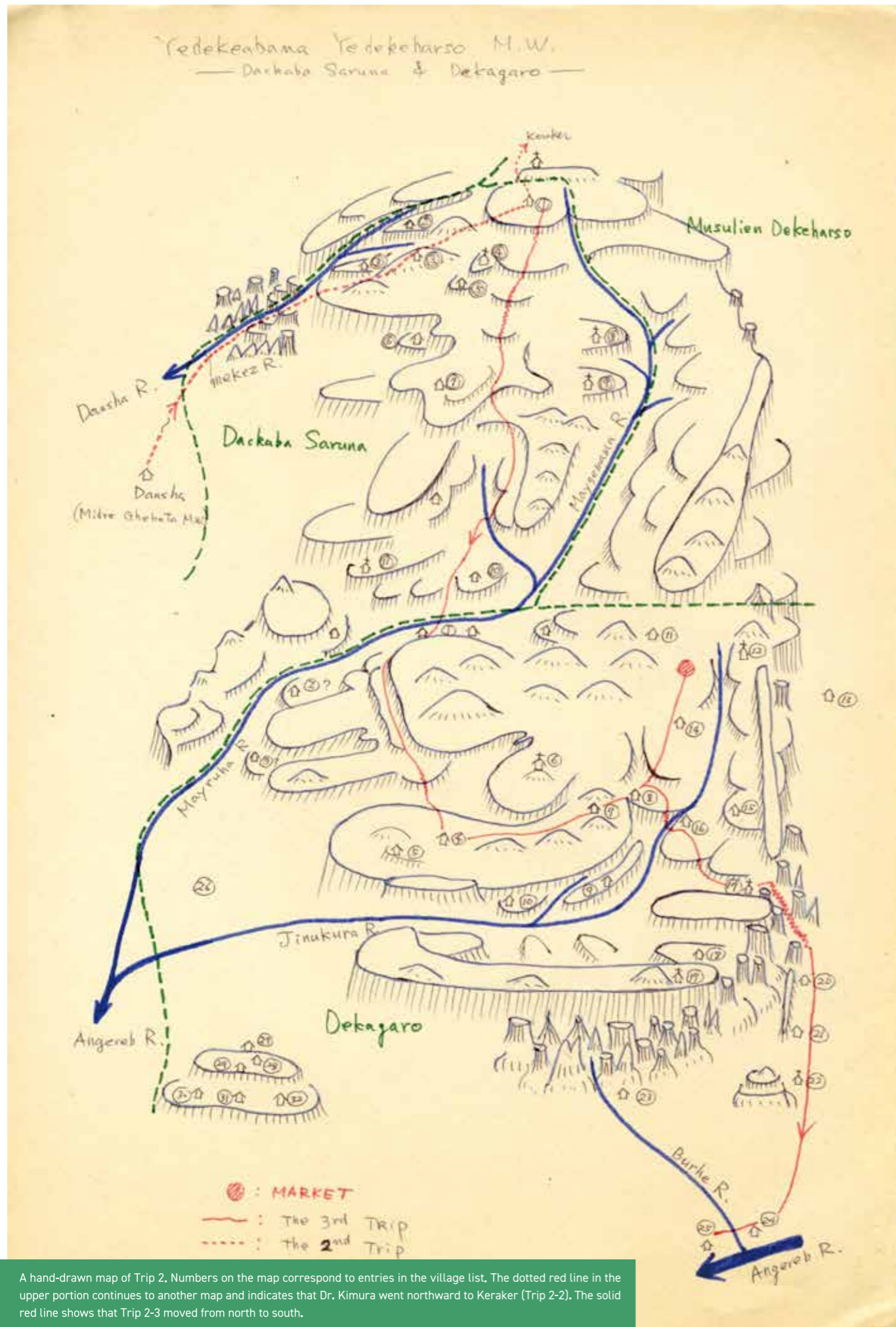
Dr. Kimura contributed countless documents, films, and maps. The picture on the right is a photo-card provided by WHO for the purpose of searching for patients.

the time, including marketplaces, schools, and medical facilities where he and his team searched for patients, scenery photographed when traveling from place to place, villages and towns he visited, and festivals and weddings.

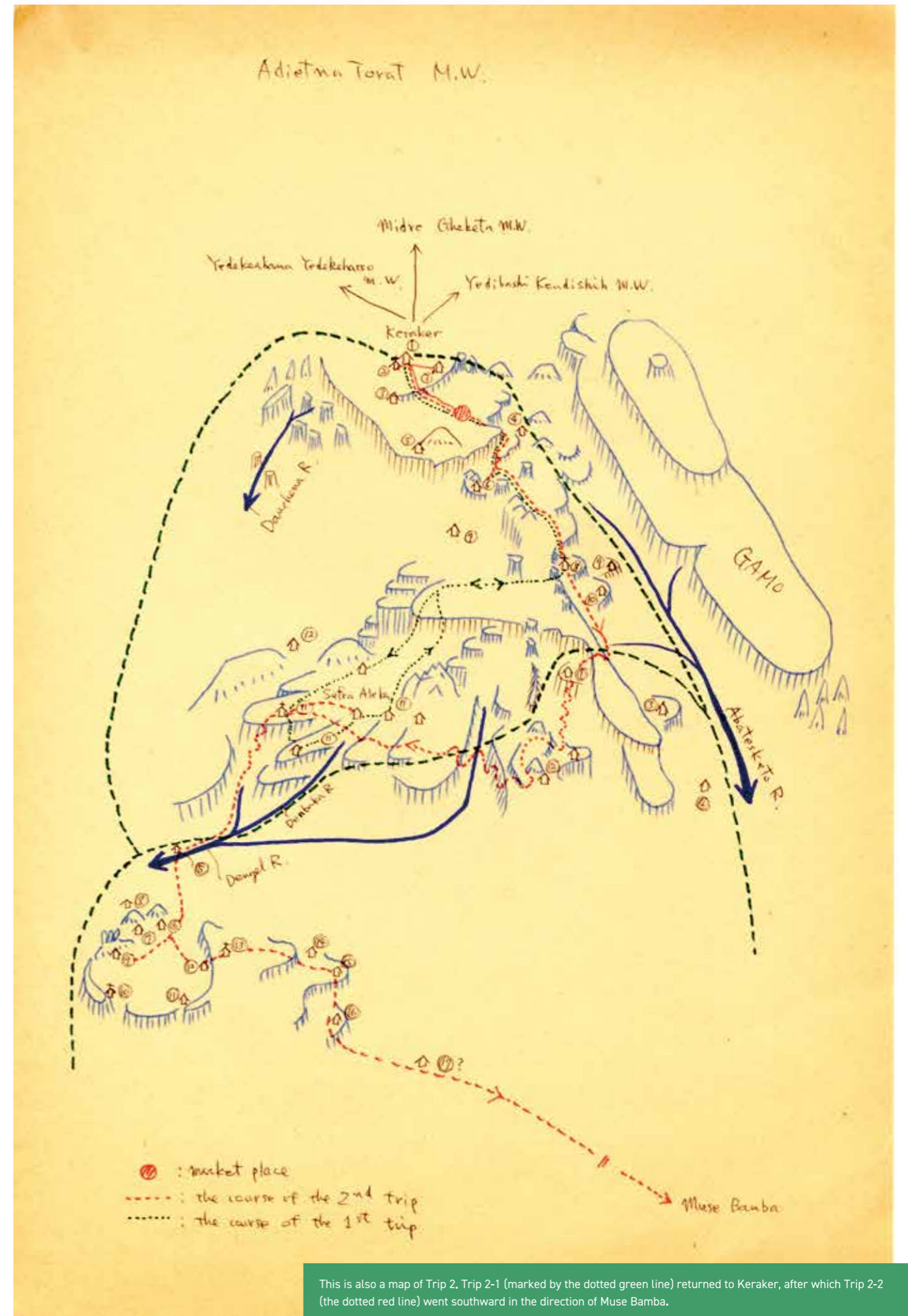
The field notebook mainly includes records of his travels from April to June 1974, drafts of maps, notes of items and occurrences he noticed while searching for and vaccinating patients, and so on.

There are also two handwritten papers about smallpox variolation written by Kimura and reports issued by the Ethiopia Ministry of Health and WHO. Most striking about the documents received from Kimura are his beautifully hand-drawn maps. The maps are on pages 5, 6, 9, and 10 of this issue—all of which were hand-drawn by him. Kimura drew the maps in his field notebook during his day-to-day trips to roughly depict the topography. He based them on actual visits to villages and information given by credible information sources. The numbers on the maps correspond to a separate list of villages.

At the time he had no official maps, let alone GPS or satellite photo capabilities, so it may have been Kimura's experience as a member of a school mountaineering club that had enabled him to create the maps. Looking back, Kimura himself said that his time in the club was far more helpful than his knowledge of medicine. Geographic and topographic information had been considered among the most important elements in executing the surveillance and containment strategy of the smallpox eradication programme. One of the maps Kimura created was included as an example in a report on smallpox in Ethiopia by the Ethiopian Ministry of Health and WHO.



A hand-drawn map of Trip 2. Numbers on the map correspond to entries in the village list. The dotted red line in the upper portion continues to another map and indicates that Dr. Kimura went northward to Keraker (Trip 2-2). The solid red line shows that Trip 2-3 moved from north to south.



This is also a map of Trip 2. Trip 2-1 (marked by the dotted green line) returned to Keraker, after which Trip 2-2 (the dotted red line) went southward in the direction of Muse Bamba.

Searching Daily for Patients

We have organized what happened on each of Kimura's trips while he was in Ethiopia into a table on the following page based on the documents he has provided us.

His expeditions can be divided broadly into five trips.

- Trip 1, referred to as a "training trip," took place mainly around Lake Tana. He joined the Peace Corps and others on this trip, so more vaccinations were administered than on any other trip.
- Trip 2 consisted of three expeditions to the woreda ("district") of Tegeda. On Trip 2-1, Kimura's team found many smallpox patients and vaccinated many people around them. No new smallpox patients were found on Trip 2-2 or 2-3, so, thinking that the vaccinations they had carried out on Trip 2-1 had stopped the outbreak, they moved on to another area.
- Trip 3 took them farther north to Wogera awraja. Although they found no cases of smallpox on this trip, they did find at least 36



cases of chickenpox, which has similar symptoms to smallpox. Kimura wrote that there were times when he rushed off to a medical facility upon receiving information of suspected smallpox cases, only to find they were actually chickenpox, so he had to pay extra attention in discerning the differences between chickenpox and smallpox.

- Trip 4 was to an area east of Lake Tana. Records show that along the way he found several outbreaks of smallpox and administered vaccinations.
- Trip 5 was the last trip that can be confirmed from the documents we received. This was through a difficult-to-access area where "Operation Crocodile" later unfolded, in which a helicopter was used to search for smallpox patients. Kimura wrote that they found several smallpox patients on this trip, but that they had to stop the trip due to difficulties such as foul weather, friction with vaccinators, and his own poor health.

Next we will take an even more detailed look at the trips.



	Trip.1 Training Trip	Trip 2-1 Tegeda Woreda	Trip 2-2 Tegeda Woreda	Trip 2-3 Tegeda Woreda	Trip 3 Wogera Awaraja, Wolkait Woreda	Trip. 4 Gayint Awaraja	Trip. 5 Semien Awaraja	
Period	October 10-28, 1973	October 31-November 23, 1973	December 10-21, 1973	January 28-February 18, 1974	March 10-April 4, 1974	April 18-May 28, 1974	June 11-22, 1974	
Sites	Gondar Awaraja Dembia Woreda Gorgora m.w. BASE: Gondarsearching patients.	Gamo-Endamariam m.w. Yedekeabana Yedekeharso m.w. Adietna Torat m.w. Yedekebashi Kendishih m.w. Midre Ghebeta m.w. BASE: Gondar	Yedekeabana Yedekeharso m.w. (Dackba Saruna & Dekagaro) Adieuna Torat m.w. BASE: Gondar	Gamo-Endamariam m.w. Yedekeabana Yedekeharso m.w. (Dackba Saruna & Dekagaro) Midre Ghebeta m.w. BASE: Gondar	Wogera Auraja, Wolkait Woreda Yeadiremet m.w. Berkuta m.w. Yeblamba m.w.	SALI m.w. (1974/04/18-05/04) TACHI NEGERA m.w. (1974/05/15-05/28) BASE: Nefas Mawcha (Capital Twon of Gayint awraja)	LAHIN m.w. BASE: Adi Arkai	
Vaccination	4681	2239	600	1302	132	609	598	
Description	Excursion was conducted at schools and markets around the eastern and northern area of Lake Tana.	The team vaccinated with 27 patients during the Trip2-1	Purpose of the Trip 2-2 to Tegeda Woreda was to catch the smallpox prevalence. Curing among the patients who were vaccinated during the previous trip was well. The team found some cases in which patients misunderstood their chicken pox as smallpox.	Trip 2-3 was third trip to Tegeda Woreda, but the team could not find new case even though they visited many markets. Through the trip, they became to know some of the reported outbreak of smallpox were induced by traditional variolation practice. Finally the team concluded the smallpox was eradicated in this area and moved to next target site.	Documents include village list but no maps. They did not find any smallpox case but many cases of chicken pox were recorded during the trip 3.	Team collected information at markets and found outbreaks. They reported vaccination at some villages and people's local practice of traditional variolation. They changed the trip plan because rainy season began.	The trip area was mountainous and far from mail road. Trip 5 was troublesome and tough due to bad weather condition, worsening personal relations among vaccinators, and physical condition of Dr. Kimura. Finally they retreat to the town of Adi Arkai because Dr. Kimura suffered from dysentery.	
Records	Trip journal and 2 maps	Fieldnotes including trip records and number of vaccination.	A map corresponding to 3 village lists, and 2 maps corresponding to 6 lists of village.	2 maps with 6 village lists, 4 daily work summary, and 2 monthly summary.	4 village lists (no maps), 2 daily work summary, and 3 monthly summary.	3 maps with 4 village lists, 7 sheets of daily work summary, 8 monthly summary, and 16 pages of household surveillance records that has detailed description of household members.	2 maps, 1 daily work journal, 4 monthly summary, and 3 pages of household surveillance record.	

Team Composition

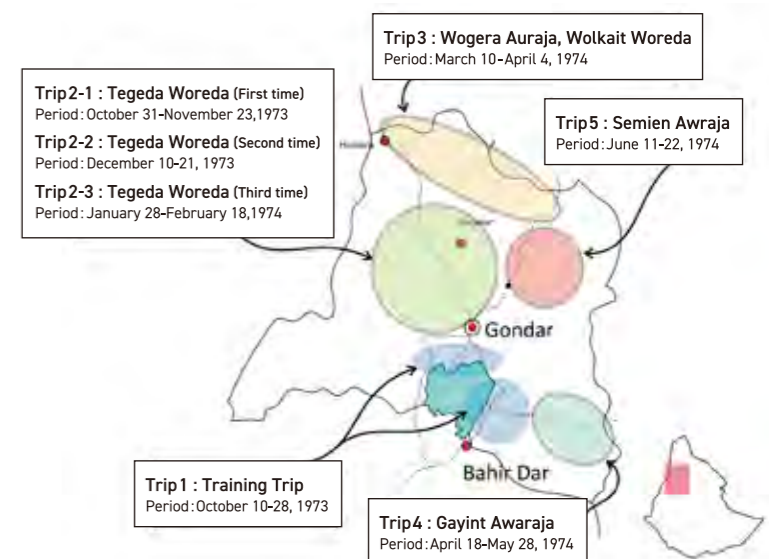
Under the direction of a coordinator, teams were made up of Surveillance Officers (SO) or Assistant Surveillance Officers (ASO), vaccinators hired temporarily by WHO, locals hired as guides, and donkeys used to carry equipment. Vaccinators were hired for three dollars per day. According to Kimura, three or four people came on each trip, and depending on the circumstances, they sometimes split into two groups.

Surveillance Officers also included Japan Overseas Cooperation Volunteers and US Peace Corps volunteers. Each team was assigned to a different area, where they would go and gather information on the potential locations of suspected smallpox patients and outbreaks by interviewing locals they would meet on the way and in marketplaces, following which they would visit such places.

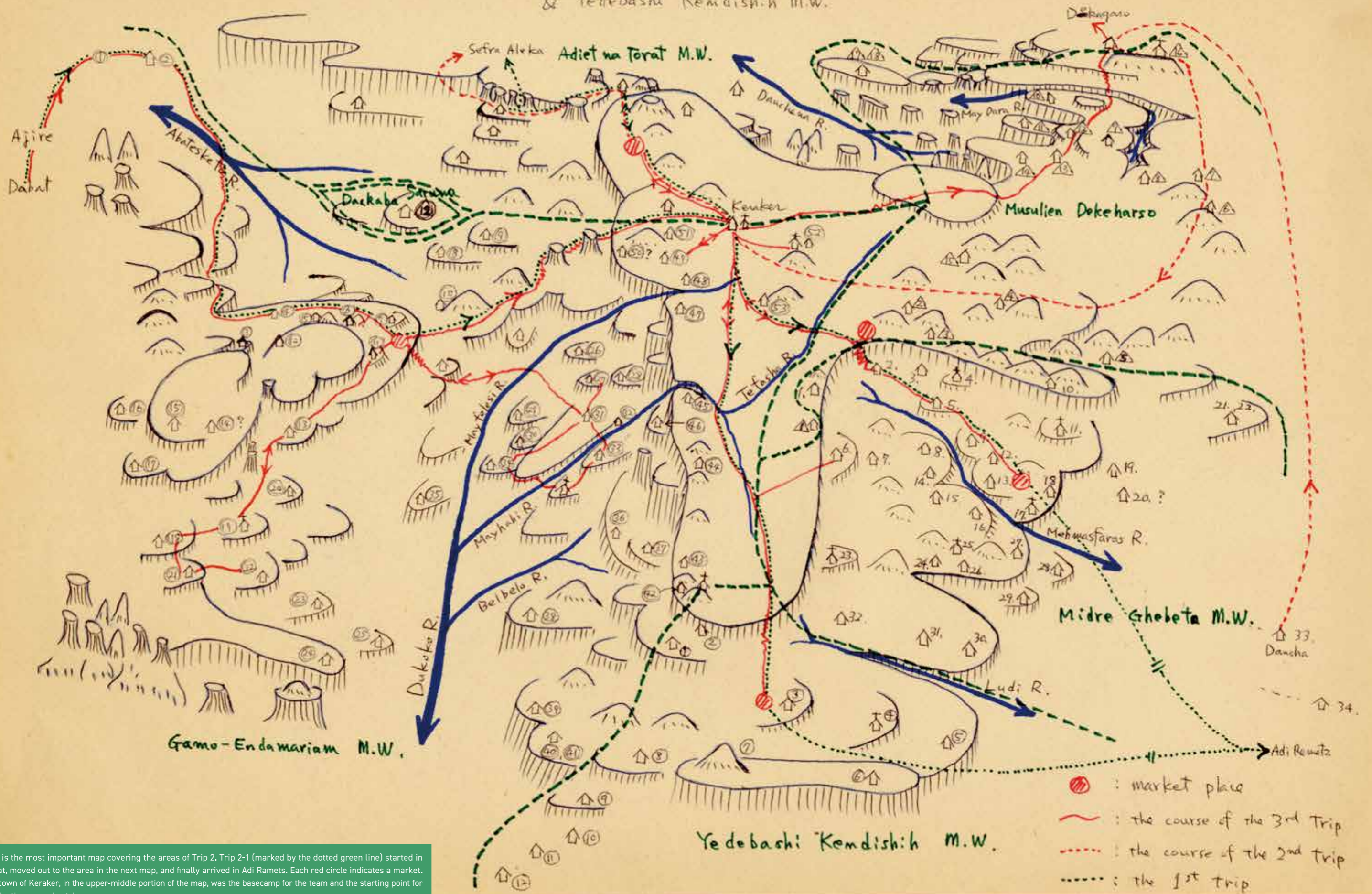
Kimura volunteered to handle the most inaccessible mountainous areas.

Searching for Patients

Teams were provided cards with color photos of smallpox patients by WHO and searched for patients mainly by showing people they would meet in marketplaces, churches, and along the way the cards and asking them questions. Kimura wrote that he realized that when doing so, in addition asking, "Is there smallpox around here? Have you seen anyone that looks like this in the photo?" it was also important to discover relevant timeframes, and he made sure to add "this year" or "in the last six months" to questions. However, there were times when he could not get information at marketplaces.



Gamo-Endamariam M.W., Midre Ghebete M.W., Musulien Dekeharso district of Yedekeabana Yedekeharso M.W. & Yedebashi Kemdishih M.W.



This is the most important map covering the areas of Trip 2. Trip 2-1 (marked by the dotted green line) started in Dabat, moved out to the area in the next map, and finally arrived in Adi Ramets. Each red circle indicates a market. The town of Keraker, in the upper-middle portion of the map, was the basecamp for the team and the starting point for vaccination excursion trips.

To deal with this, Kimura created detailed distribution diagrams of villages based on information gained from people he had interviewed previously. When he had no information on whether there was an outbreak, he would go into marketplaces himself and read aloud the name of each village to search for people of the village he was looking for. In this way he would search for patients by actively making an effort to interact with people. And if there was a village with no report of outbreak, he would try looking for people from such village, but in places like that he would ask, “Have you ever heard of a disease like this before?” instead of his normal questions.

His criteria to determine whether there were any cases was based on intuition, but he considered the credibility of reports, size of the village, and distribution of homes. To determine if a report was credible, he would ask people questions such as, “Have you been to that village recently?” “Do you have any friends in that village?” “Do you go to one another’s villages often?” “Do you know the name of the *chika* (“chief”) of that village?” “Do you know what the village chief’s house is like?” “Does the chief have a dog?” and observe their expressions and reactions.

During his trips, wherever he went he would ask people—travelers, merchants, anyone—questions such as where they had come from and whether they had seen or heard about smallpox cases. “Searching along the way like this is surprisingly effective,” wrote Kimura. In fact, he says that most of the information he obtained on outbreak areas was from passersby. Talking to children also proved useful. He gathered information from children who were old enough to talk with by asking whether they had any friends who were sick in bed.

Now let’s take a closer look at an occurrence on Trip 4 to see specifically what the searching and vaccination activities consisted of. On the morning of April 30, 1974, Kimura and his team went to interview people who came to the Tuesday Market to gather information on smallpox patients. On that day they sought the help of the district governor, which proved to be very effective. Kimura read the list of villages aloud, and the governor’s assistant went deep into the marketplace to look for people from villages on the list. The governor’s help extended beyond simply that. It



Residents receive smallpox vaccinations in an area of Ghiften Arba Etuorsa on May 21, 1974. Dr. Kimura and his team conducted 56 vaccinations on the same day.

also made it easier to seek the help of locals and was an effective means of obtaining comparatively reliable information in a short period of time. Kimura was able to obtain information on smallpox cases in three localities—Korenych, Keba T/H, and Abi Arb—and his team administered 93 vaccinations at the marketplace.

Based on information gained at the marketplace, the team set out for the village of Korenych that same day—a two-hour walk away. Soon after they arrived at the village, they found three smallpox patients in one household. Records show that the following day they found nine patients in a different household and vaccinated 63 children in the village. The infection route was unclear, but Kimura and his team learned from the villagers that there had been an outbreak in Daba T/H locality in Lai Negela sub-district in two or three months earlier.

Next, the team headed for Keba T/H locality, some five hours away. No outbreak of smallpox was found there; what was thought to be smallpox turned out to be chickenpox. After that, they went to Weldeye (a village of about 15 homes) in Abi Arb locality. There they found 11 smallpox patients and vaccinated 25 children. Six of the 11 cases in the village had been caused by a traditional smallpox prevention practice called variolation (see

page 13). The infection route was thought to be from the village of Margeja in the same locality, so they visited that village but found no new cases.

Later, on Trip 4-2, they visited the locality of Ghiften, which was suspected to be along the infection route for Weldeye village. They found no new cases there but vaccinated 56 people (see photo on the previous page). Then on May 24, they visited the localities of Samho Kuskua and Akahina Mariam. No smallpox patients were found there but they vaccinated a total of 105 people at the request of the residents. This is how the surveillance and containment strategy were carried out, by searching for smallpox patients and thoroughly vaccinating all people around them.

On Trip 5, Kimura’s last search trip, he discovered that a traveling monk was spreading infection. He wrote the following in his notes:

Departed at 6:30 in the morning on June 18. Arrived at a village called Lamo at 10:30. Found several smallpox patients. One young woman had lost sight in one eye. She might lose her other too. Interviewed her family to find the source of infection. They say that about 10 days ago a traveler with a smallpox rash had stayed at their home. The traveler was a monk from Semen in the outbreak. We must go to his village and study how much it has spread.

(Kimura 1977)



A common scar resulting from variolation, which involves applying scar tissue or pus from smallpox pustules into the skin of an uninfected person’s wrist.

Fighting Foul Weather

The location that Kimura and his team visited was a difficult-to-access mountainous area, and the weather in the rainy season made travel especially difficult, sometimes forcing them to alter their itinerary. Next we will take a look at some of his notes from Trip 5 that describe what it was like.

(June 19) On this afternoon, while surveying people in the village of Koa Giorgis on the other side of the river, we were hit by a sudden squall of hail and rain. The mountain path became like a waterfall in no time and the river rose, turning into a brown, muddy whirlpool. And terrible lightning. I had never experienced heavy rain like that. I could barely see my teammates in the rain. The villagers said that if we didn’t cross the river right then and there, we wouldn’t be able to get back to the riverbank on the other side, so we entered the river—I thought my heart would explode. With me in the middle, three of us slowly trudged toward the center of the river hand in hand. The villagers yelled to not look at the water and keep our gaze fixed on the bank on other side of the river. After that, we were frantic. Not only our clothes, but our money and survey forms were soaked too. When we got back to our tent, it was flooded. It was cold. No food. At night when the thunderstorm subsided, someone living near our tent gave us a piece of injera and a gourd of milk. Thank God. Mentally and physically exhausted, we took the next day off. We hung our sleeping bags on our tent and spread out each survey form on the grass to dry. There was another thunderstorm in the afternoon. I felt utterly dispirited.

Five days later Kimura decided to turn back to base due to poor health. Afterward he wrote the following:

June 24, 8 in the morning, I departed feeling dizzy. We went down a path from behind the village that goes straight down along a precipitous cliff to the bottom of a ravine. Anyone with fear of heights would have been petrified with fear. We followed our guide down carefully. One thing that amazes me about Ethiopia is how people build paths like this on such sheer cliffs. Someone actually made a path here, where one misstep and you’re dead... It took nearly three hours to reach the end of the steep path.

After that we had to deal with flooding. The path on the bottom of the ravine wove along the shape of the river back and forth from right bank to left, left bank to right. If the river rose, the path would quickly disappear. It is used in the dry season when there is little water, but it is dangerous in the rainy season. I was so scared I completely forgot about my fever, stomachache, and diarrhea. I had to walk in and out of the muddy brown water ... While we were walking, we were hit by a squall with lightning, and the river started to rise rapidly. Fearing a flash flood, we had to quickly get out of the ravine. Before we knew it, we were running for our lives. Our guide ran ahead leaving me—his boss—behind. I don’t know how long I ran. The path gradually started to go up the mountainside on the right bank, and when I was confident I had escaped the danger of the water, I just sat down. Not long after we came out of the ravine, two locals were washed away in the flood and died.

(Kimura 1977)

Adi Ramets Steam Engine

This is something Kimura saw in the town of Adi Ramets when he just started searching for patients in the mountains. Looking completely out of place with its surroundings and grazing livestock, the metal monster was entirely rusted and overgrown with trees and brush. The photograph is thought to have been taken on November 21, 1973.

It doesn’t seem unreasonable for Kimura to have thought this had been a steam locomotive at first, but the mountainous area of Amhara has no railway tracks. After research based on information provided by Dr. Riichi Miyake, Dr. Toshikazu Tanaka, and Dr. Tatsushi Fujihara, we found that it was a portable steam engine, possibly made by the English company Richard Garrett & Sons. It is unclear when it was made, but likely at some time between the end of the 19th and middle of the 20th century.

It was not a locomotive, so it was not self-propelled. The four wheels on the ground were just for locomotion. It was



probably pulled by a vehicle or livestock. When the wheels on the top turned, it probably moved a belt that activated an external machine such as a thresher.

What is not known is when or who brought it there, or why they did so. Kimura remembers that there was a place near Adi Ramets called Campo Meda, so it might have been brought by the Italian military to develop a plantation.



God of Smallpox

When there were smallpox epidemics in Japan, people practiced customs to protect themselves from the disease such as placing ofuda (charms made of paper strips) inscribed with the name of the god of smallpox in front of their houses and praying at Shinto shrines dedicated to the god. Similar customs can be seen around the world, and Ethiopia is no exception.

One of the documents passed down from Kimura is a handwritten paper on local customs related to smallpox in Ethiopia.

Many interesting superstitions on variolation remain in Ethiopia. In many places in the country, after administering variolation people beseech the god of smallpox to make the process go smoothly by dancing, praying, singing, and other practices. Intentionally implanting a disease in a healthy person, often one's own children, is a peculiar practice, so people pray to the god of smallpox so that he would not be offended. As mentioned above, the strain of smallpox in Ethiopia is caused by variola minor. Because it has a low mortality rate, it is not thought of as a frightening disease. Regardless, many superstitions persist today, and this may be the reason why.

Variolated children are "quarantined" in a corner of a room from the time symptoms appear until the scab falls off. During that time, the family brews coffee three times a day, offers it to the god of smallpox, and places some of the charcoal and ash

used to brew the coffee in a special earthen pot. The family also has a small straw basket in which the god is said to reside. Whenever they eat, they make sure to place some food in the basket. The basket contains a variety of items including injera (a type of bread, a staple food for Ethiopians), dabo (Ethiopian bread), pinto beans, corn, a small ceramic container with butter and cheese, and the bandages used in the variolation. The above-mentioned pus from the smallpox pustules (see the column below) is also placed in the middle of the basket, and it is considered an idol of the god of smallpox. After the patient recovers, the family keeps the pot with charcoal and ash and the basket with food until someone in the family has a dream where the god of smallpox tells them to "throw me away somewhere." After receiving this message, the family gathers in a specified place and bids the god farewell with coffee and other foods.

(Excerpt from one of Kimura's handwritten papers)

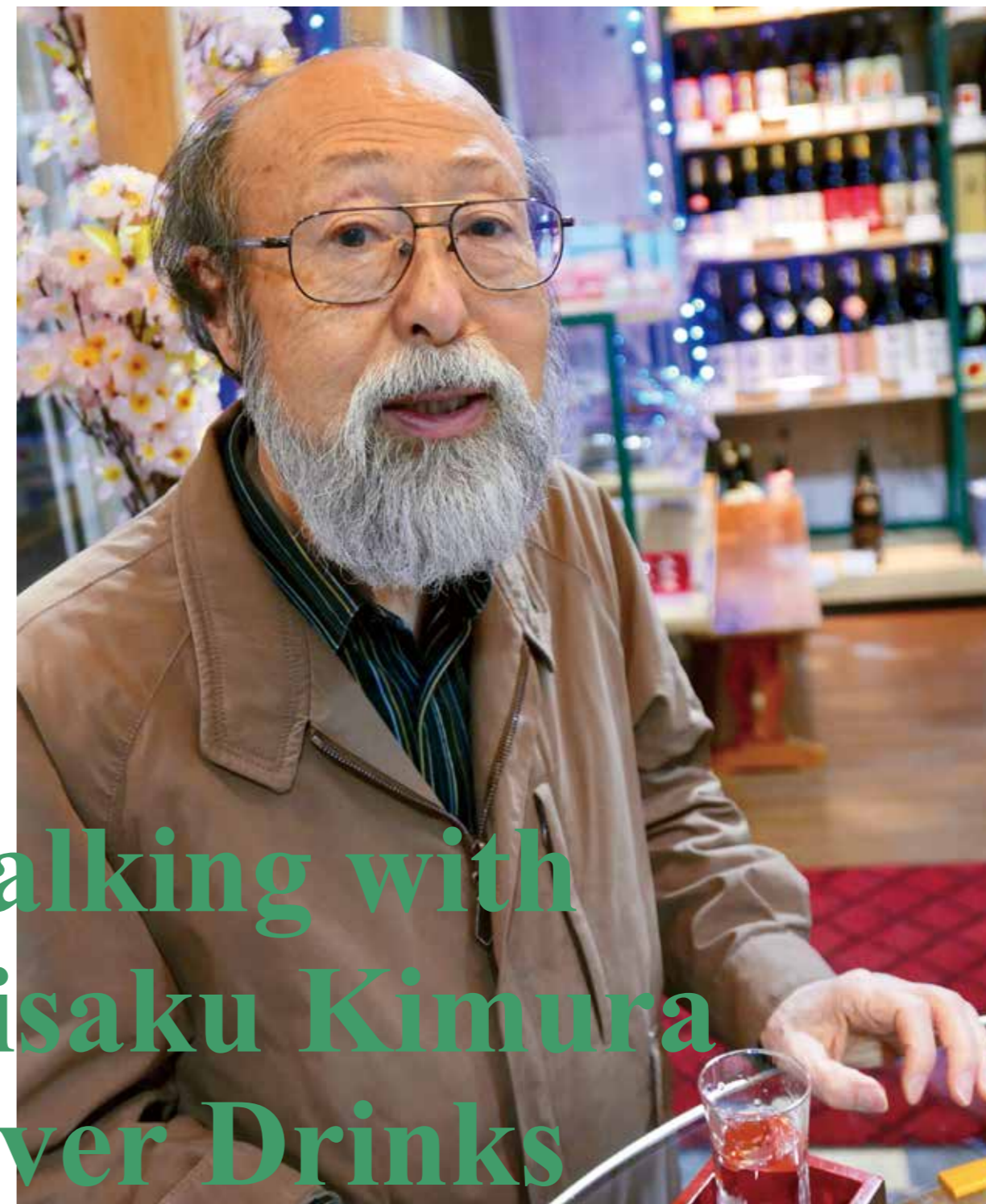
There are several photos of the idol and offerings to the god of smallpox. The areas Kimura visited still observed a traditional practice called "variolation," that of intentionally giving someone smallpox so they will develop immunity against the disease. Kimura suggests in his paper that there may be a connection between belief in the god and variolation. It is not certain, but it is difficult to say that there is no connection at all.



Variolation

The areas Kimura traveled to were still practicing a traditional method to prevent smallpox called "variolation." Variolation is the practice of applying pus from smallpox pustules on the skin of uninfected people (usually children) and making scratches there to intentionally infect them with smallpox so they would develop immunity. Based on Kimura's experience, in Ethiopia they would take pus directly from smallpox pustules with the thorn of an acacia branch or using other means, and then make a small incision with a blade on the skin of an uninfected person about 10 cm above the left wrist and wrap a bandage that had been rubbed with the pus around the incision. In some cases, pus taken from the smallpox patient would be stored in a small glass jar and mixed with spices, butter, honey, and other items to be used to variolate those nearby who were interested.

According to reports by Ethiopia's Ministry of Health and WHO, variolation was practiced often in Gondar province, in which Kimura worked. The reports state that the variolation implementation rate in the province was about 75% in 1971 and 9% in 1973. Compared to patients naturally infected with smallpox, those infected with smallpox via variolation are said to not only experience a shorter incubation period, but to have symptoms that are often lighter and subside more quickly. However, the resulting ailment is sometimes confused with chickenpox, often making diagnosis difficult. Furthermore, several outbreaks were thought to have started due to infection spreading from patients infected with variolation. Also, people in areas in which the custom was practiced had a strong opposition to vaccinations. Kimura says he remembers cases in which people would refuse to vaccinate themselves, but let their children be vaccinated.



Talking with Eisaku Kimura Over Drinks

The First Words I Learned in Amharic

Kimura: When I was in Ethiopia, I knew enough of the language so I could do things like go shopping without problems, but I can't speak it at all now. The day I arrived, this virologist named Yoshihiro Makino, my senior at Nekken (Nagasaki University Institute of Tropical Medicine) (later the professor of Oita University) told me, "If you don't learn Ethiopian you won't make it out in the country." Right then and there he said, "Make sure you at least remember this," and taught me "*Shint bet yet new?*"

(Where is the toilet?) and "*mebilat ifalegalehu*" (I want to eat something). He told me to learn phrases like that right away, so I learned them as if my life depended on it.

Some of the local staff spoke English. And we had guides. But I couldn't have an interpreter by my side at all times, and although there are no restrooms over there—in the morning everyone just goes and relieves themselves in the bushes—if you didn't know the local language, you'd be in deep trouble. I might have felt animosity toward him if he told me something like, "You can't speak any English, can you?" but when I was told I had to learn the local language in a place like that, I was surprisingly complaisant [laughs].



Ethiopia in 1973

There were a lot of beggars in Ethiopia at the time. I mean really a lot. Wherever you went, they were all over the place. I don't think the famine in Ethiopia at the time got in the Japanese news. I remember someone from WHO saying people were dying in the tens of thousands. The places suffering from famine were dangerous—you weren't supposed to go to places like that.

Where I was working (in the north), water was a pretty big problem. One time I went with some villagers to get water. It took several hours to get to the bottom of the mountain, and there was a river, well, a ravine, but with little water flowing. There was a fairly deep hole dug there. Everyone would go into the hole and wait there until it filled up with enough water. When there was enough, they would put the water into big jars. About seven or eight villagers would fill their jars and walk for several hours back up the mountain.

I think I have a photo of a little girl with a small jar ... The place was 3,000 meters high, and there was water even in times of famine and drought. But since there wasn't a lot of water, she waited for the hole to fill up, fill a small jar with water, and return home. Adult women would walk down the mountain for several hours with larger jars on their backs. It was hard work. It was kind of like what we used to do in mountaineering club at school [laughs]. I don't think they drew water every day, but it was a really tough life.

“You're Not the Type of Person We Were Looking For.”

(This looks like a photo from during training.)

Kimura: Right. This is Dr. Ciro de Quadros. Later he became a director of activities in the Americas. He was still just an underling then, though. When I came to Ethiopia, he did a variety of things like training and so on. He provided the smallpox training to the members of the US Peace Corps and Japan Overseas Cooperation Volunteers (JOCV) for a while.

When I worked at Nekken (in the early 1970s), I told them that I wanted to go to Africa, and the head of internal medicine at Nekken told me about the smallpox program. I wanted to go, so I said okay right away. When I arrived in Ethiopia, I went straight to the WHO office. The boss, I think his name was Kurt Weithaler, called me over and told me clearly, “You don't meet any of the requirements WHO requested of the Japanese government.” In other words, there were many requirements such as having had to work in public health for a certain amount of years and having had to be a doctor that did certain things, but I had just graduated from university and didn't meet any of them. So, he told me, “You're not qualified to work with us at the WHO office.”

He said the only thing I could do was work with JOCV—that was on the first day I went to the office. He told me that the US Peace Corps were undergoing training now so I should go join them. I had never been on an airplane before and had never even studied English conversation. Well, from my point of view, I was able to work out in the country instead of in an office, so I was really lucky, actually.

In any case, thanks to him, I was out in the field from morning until night rather than going to meetings in an office and some-



Ciro de Quadros (in blue and pink on the left) was a public health expert well known for polio-eradication projects. He later led the EPI smallpox-eradication programme.

times going out into the country to observe, so I was really happy. You know about Operation Crocodile (1974 - 78), right? When that started, there was a revolution underway in Ethiopia, so it was pretty dangerous for Americans and Germans. But no one would attack Japanese, so in the end there were only Japanese people. They even asked me to participate in the operation—me, who had been told before that they had had no use for me. I was really excited and planned to join, but then I got sick.

Memories of Dr. de Quadros

Dr. de Quadros may have helped my career behind the scenes. Several years after Ethiopia, I was invited to go to the WHO office in Samoa. But there were already a few other candidates from Japan being considered—one of which was a doctor who had graduated from the University of Tokyo (one of Japan's top universities). Apparently, WHO interviewed the doctor. But no one contacted me. When Yoshito Wada, the parasitology professor of Nagasaki University who referred me, heard that, he said, “Sorry, but I don't think you will get the job.” “Oh, okay. Thanks for your help anyway,” I replied, and thought that was that, but several months later someone contacted me saying that I had in fact landed the job. Once I started the job, I found out that there were several issues with my qualifications, such as my English ability, so I wondered why I had been suddenly hired. After thinking about it much later, I realized that Dr. de Quadros must have recommended me when I applied. I can't think of any other reason. Dr. de Quadros read many of the reports I wrote in Ethiopia, so he knew about my experience there. When I applied for WHO in Samoa several years after Ethiopia, perhaps Dr. de Quadros heard the name “Kimura” and recommended me ... That's just a guess though.

From Smallpox to EPI and NTD

(Igari: Over the course of reading these documents I learned quite a lot about smallpox. I didn't hear much about smallpox in global health classes at graduate school and nothing about how it was eradicated.)

Kimura: You know the vaccination program Expanded Program on Immunization (EPI)? This came about because of the success they had with smallpox. They thought the same could be done with other diseases. After eradicating smallpox, they had a conference on what other diseases could be eradicated. About five or six were selected, including filariasis, polio, and others, and they launched the EPI. In 2000 a filariasis control program was launched. They worked hard to try to treat the disease. As the program progressed well, it provided further encouragement, and now Neglected Tropical Disease (NTD) is drawing interest. Smallpox was the initial trigger.

Goiter-prone Area

Although the purpose of Kimura's trips was to search for smallpox patients, he also encountered people with measles, Hansen's disease, and elephantiasis. Many of the pictures he took were of people thought to have goiter—an enlargement of the thyroid gland in the neck. Kimura recalls that there was one village in which there were many people with these symptoms, and when they surveyed the villagers, they found that around 70% had swollen thyroid glands. One of the possible causes was lack of iodine in the diet. Iodine deficiency in mothers can cause cretinism (congenital hypothyroidism), which can lead to growth retardation, learning disabilities, and other problems. There are records of goiter in the mountainous region of Ethiopia in the 19th century, where it is considered an endemic disease. However, to the people who live there, it is just an ordinary part of life. According to Kimura, they don't seem concerned with swollen thyroid glands and go on with their lives normally.



Petrus Aswin Koswara (1931-74) was an Indonesian medical doctor. He died in Addis Ababa in November 1974 while leading a smallpox-eradication programme. Dr. Kimura, who happened to be in Addis Ababa at the time, attended Koswara's funeral.

Memories of Petrus Aswin Koswara, who Passed Away in Ethiopia

(Did you ever meet Dr. Koswara, the Indonesian who died during the program?)

Kimura: Yes, of course. I lived at the JOCV's office in Addis Ababa, and his house was nearby. He had a bad heart.

(According to reports and other documents, you and your team went around asking people questions while showing them color photos of people with symptoms, but apparently Dr. Koswara was the first to say that you should use that method.)

Kimura: Oh really, I see. To us it was just common sense, but thinking about it now, I guess it would have been unconventional several decades ago. We looked for patients by walking around and showing people the photos WHO had made.

What They Really Need Are Measles Vaccinations

Kimura: At the time, measles was more widespread in Ethiopia than smallpox. When we gave smallpox vaccinations at this one village, apparently someone asked if it also works on measles. When someone said that it has nothing to do with measles, another said, “Well, then I don't need it,” and went home. I remember it well. We were right in the middle of giving vaccinations and one after the other, people started going home. “What on earth is going on?” I wondered. After asking around, I found out that people who had come because they thought the vaccine would work said they didn't need it after all if it didn't work on measles. (So, what they really needed was a measles vaccine.)

Kimura: Yeah, if you get measles, you'll die. Really. I can tell you from experience. I went somewhere a while after there was a measles outbreak, and the number of children had really gone down (They all died in a short period of time?)

Kimura: Yes. Right. They died. The mortality rate is incredibly high. Actually, people didn't die from smallpox in Ethiopia. The mortality rate was just a few percent. So, from the point of view of the locals, smallpox was not a very serious disease.

But nonetheless, they worshipped a smallpox god, which must have had some reason behind it. In any case, measles had a much bigger impact.

Doctor Dance

Eisaku Kimura

This is an English translation of an essay "Doctor Dance" written by Dr. Eisaku Kimura. The original print was published in Japanese in *Expert* (Japan International Cooperation Agency),

1987, pp.166-167

I departed for Ethiopia last September as an epidemiologist in WHO's Smallpox Eradication Programme there. When I was appointed, I was impressed that I had been able to get such an important-sounding title since I was just a new doctor working as an assistant at a university-affiliated hospital in Japan.

But when I arrived in Ethiopia, my actual duties were that of an assistant, so it was a perfect fit for me. My job was to travel from village to village searching for smallpox patients. I loaded a tent and food on a donkey and set off.

My first trip was to the Tegede "Woreda" (region). It was a difficult area that no one had ventured to yet since the program launched. We had to walk four days along a steep mountain path to get to Keraker. My experience as a member of the mountaineering club in school turned out to be more useful than my medical knowledge.

When we finally arrived at the town of Keraker, we were strangers to the people there, and they were distant and unfriendly. We couldn't even get food. We had to negotiate from morning to evening just to get a piece of injera (the staple food in Ethiopia).

But after being there for a while, we started exchanging greetings with the villagers, and the second time we visited, teachers and students stopped their lessons and gathered around to shake our hands as soon as we arrived. People we met before and even the governor visited our tent. When we would say "hi" to the villagers, they would

respond warmly.

The town of Keraker is in the highlands, about 3,000 meters above sea level. Located in the middle of a eucalyptus forest, the town would suddenly turn calm and quiet when the sun set.

Feeling unsatisfied, I went to take a stroll in the grassland while smoking my pipe. I quietly sneaked into a herd of live-stock and chased a young goat around like a little kid. Seeing me, the villagers laughed. They were no longer wary of us as strangers.

My Long-sought Wedding Invitation

Most of the people in the region are devout Christians and belong to the Orthodox church, which has strict rules. They practice a custom of fasting, which they call *tsom*, that starts in mid-February and lasts for about 55 days. During that time, they eat no animal products, except for fish, including meat, milk, eggs, and butter.

The week before *tsom* is a special time for them. Not only is it the last week they can eat meat, but it is also a "week for weddings." The Thursday before *tsom* is called "*ibid Hamus*" (Crazy Thursday). It is a day of wild merrymaking and there is a rush on weddings.

On my third visit to the region, Keraker was right in the middle of such a wedding rush. Wanting to see a wedding somehow, I waited for an opportunity, and it came faster than expected. One morning, the governor suddenly showed up at our tent and invited me to a wedding. A few days earlier I had examined his granddaughter when she had been sick. I gave her some medicine and she quickly recovered. Ever since that fortunate occurrence, I think the villagers started to see me as someone who actually deserved the title of "doctor."

Wedding venues in the region are all of similar design—essentially a square hut made with a frame of eucalyptus branches. Everything other than the entrance is covered with eucalyptus leaves, and yellow, dried grass is spread on the ground. The seats are covered with cowhide. The attendees drink *tella* (a traditional Ethiopian beer) and talk and laugh.

I was given the seat next to the governor as a *tiliq sew* ("important person"). Soon a large plate with a huge chunk of beef was brought in, and *tella* was poured into our cups. Raw beef is the most lavish dish in the Ethiopian countryside. Everyone shoveled it into their mouths like it was the best thing they had ever eaten.

The custom of eating raw beef is the reason the parasite tapeworm has spread in Ethiopia, but tapeworm doesn't cause serious harm. If I found some in my stool, I figured I could sell it to a Japanese medical student and they'd be happy to buy it at ¥1,000 a piece, so I greedily devoured more raw meat than anyone.

The sound of drums being played in a fast, intense rhythm filled the air, and women and children clapped their hands singing. Then they started that curious and unique Ethiopian dance of keeping one's head still and vigorously rolling only the shoulders.

"Doctor Kimura, would you like dance?" someone asked. He was probably joking. But, fueled by alcohol, I took it seriously and jumped up from my seat right into the middle of the dancers. That isn't something that is normally done. Only women and children are supposed to sing and dance at weddings. The *tiliq sew* is expected to just sit and calmly eat meat. That alone should have made the wedding more dignified.

But since the doctor started dancing with no regard to his surroundings, I guess the other distinguished guests, like the governor, judge, and chief of police, just couldn't sit still any longer. They cheered me on and started clapping their hands to the music, and before I knew it everyone was dancing.

The merrymaking continued throughout the night, and when I found the right time I escaped with the governor.

Keraker's mornings vie for beauty with its nights. The livestock scattered across the vast grassland glistened in the morning sun. As I crawled out of my sleeping bag, the cold pierced me to the bone. Back to work again, I thought to myself. With this village as the base, I have to walk around to other villages again.



This picture is believed to have been taken at the wedding site mentioned in the essay "Doctor Dance." The woman in the image is baking injera outside. Can you find the huge difference of the scene between then and now?



A lady showing a radio-cassette device. It was possibly "made in Japan" with a SILVANO brand logo of Japanese KYOEI ELECTRICS.



This out-of-focus picture was taken at the wedding ceremony. When Dr. Kimura joined the fun, the surprised participants started clapping and cheering. The tall person behind Dr. Kimura was a staff member from his team.



Showing a banquet at the wedding party mentioned in the essay, this picture is believed to have been taken in early February 1974. The gun-toting men might have not imagined that Dr. Kimura would begin dancing soon thereafter.