

アフリカゾウのエンリッチメントの実際

Feeding-Enrichment for African Elephants

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My name is Tetsuo Suzuki from the Higashiyama Zoo & Botanical Garden.

So, I would like to go ahead and show everybody what we, as a team, actually do in the zoo.

These are the elephants that are currently being kept at the zoo.

アフリカゾウのエンリッチメントの実際
 タンチョウも。
 Feeding-Enrichment for African Elephants, Also Japanese Cranes
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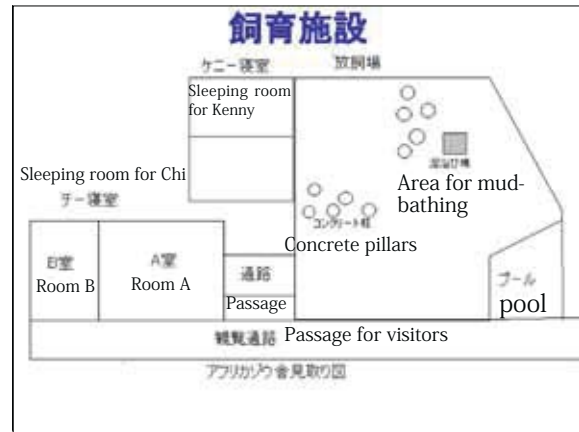
【Slide 1】

飼育個体 Elephants being kept at the zoo
 チー オス 34歳 (2009. 6. 9死亡)
 ケニー メス 36歳 (1973年推定2歳で来園)
 Chi, male, 34 years old (deceased June 9th, 2009)
 Kenny, female, 36 years old (Came to the zoo in 1973 when she was presumed to be 2 years old)

【Slide 2】

Unfortunately, Chi, the male elephant passed away this June. However, he will also come out in the video clips. We also have Kenny, a female elephant that is 36 years old. [slide 2]

This is the facility where we keep the elephants. To the right is the area for exercising. We also have sleeping rooms; we were using two rooms per elephant. Currently, all four rooms are for females, and Kenny uses them. [slide 3]



【Slide 3】

環境エンリッチメント
 その動物の野生での生活を基本に、彼らの動物園での生活をより豊かにすること
アフリカゾウの生活を豊かにするために採食時間を延長させる
なぜ？
 野生のアフリカゾウは、1日のうち18時間(75%)を採食行動に費やすといわれている。
 動物園では、野生と同じ環境にすることは無理。
 できるだけ野生と同じ状態にする事は可能。

【Slide 4】

[slide 4]
Environmental Enrichment
 Enriching the lives of the animals in zoos based on the lives of the animal in the wild
Extension of time for foraging in order to enrich the lives of African elephants
Why?
 African elephants spend 18 hours a day (75% of the day) foraging for food.
 It is impossible to make the **environment** in zoos the same as the environment in the wild.
 It is possible to make the **condition** as close as possible to the wild.

Environmental enrichment, as everybody has been saying, is to enrich the lives of animals in zoos. How can we enrich the lives of African elephants in zoos? First, we thought of extending the time for foraging. I think that some people are thinking, "why does extending the time for foraging enrich their lives?" The reason behind this is that African elephants in the wild

spend approximately 18 hours per day eating food. Thus, eating is very important for African elephants. It is impossible to make the environment the same as that in the wild. There is no way we can bring in a savannah, but by using enrichment, the same condition can be created to an extent. [slide 4]

**採食時間延長のための方法
その1**

給餌回数を増やす

1日7~8回に分けて給餌する。

Method to Extend Time for Foraging 1

Increasing the number of times the animals are fed

Dividing meals to be fed 7-8 times a day.

【Slide 5】

Schedule for feeding Time									
Time	Place	Feeding Stuff	(kg)						
9:00	Room B	Hay	5	peanuts	0.1				
9:20	Outdoors	Silage	25	Hay cube	2	Peanuts	0.1	Wood	Moderate amount
11:00	Outdoors	Silage	5	Hay cube	1				
11:45	Outdoors	Silage	10	Hay cube	2				
13:00	Room A, B	Hay	8	Silage	5	Chopped food	3	Peanuts	0.1
14:30	Room A or B	Hay	7	Chopped food	2	Peanuts	0.1		
16:00	Outdoors	Silage	5						
16:15	Room A, B	Hay	40	Chopped food	5	Cabbage	2	Pellets	4

【Slide 6】

So, in order to extend the time, we simply increased the number of times the elephants are fed. Until then, we only fed them approximately three times a day, but currently we divide their meal so that they are fed seven, eight, or rather close to ten times a day. The elephants would have a maximum of an hour and a half between meals when food is added. [slide 5] [slide 6]

This is the second method we take. We carry out a variety of enrichments. In both the rooms and the area for exercising, we currently have approximately 30 types of enrichments, and we carry out a variety of these combinations. Elephants are intelligent animals, so in order to prevent them from learning what we do and thus losing interest, we try to change the menu slightly every day. It also takes a lot of work to do everything, so we pick out different options a bit by bit. [slide 7]

**採食時間延長のための方法
その2**

さまざまな環境エンリッチメントの実施

- ・室内、放飼場共に約30種のエンリッチメントをおこなう。
- ・環境エンリッチメントは飽きを防止するため、毎日メニューを変えておこなう。

Method to Extend Time for Foraging 2

Carry out different types of environmental enrichments

- ・ Have 30 types of enrichments in both the rooms and the outdoor area
- ・ Change the menu everyday in order to prevent the animals from losing interest

【Slide 7】

環境エンリッチメントの紹介

アフリカゾウ編

Introduction of Environmental Enrichment

African Elephants

【Slide 8】



【Slide 9】

No.	Name	Description	Effect	Amount of time and effort needed
1	Hiding hay cube	Hiding hay cubes on the wall etc.	Large	Large
2	Hiding hay cube (on top of wall)	Hiding hay cubes on top of the wall	Large	Medium
3	Leg feeder 1	Making a hole on a wide leg and hiding peanuts in it	Small	Small
4	Leg feeder 2	Making a hole on a narrow leg and hiding peanuts in it	Small	Small
5	Burying in soil	Burying food	Large	Large
6	Tire	Placing food in tires	Medium	Small
7	Hole of fire extinguisher	Placing food in holes	Large	Medium
8	Hemp sack	Placing food in hemp sacks	Medium	Small
9	Cardboard box	Placing food inside a cardboard box	Small	Small
10	Paper bag	Placing food inside paper bags of feeding stuff	Medium	Small
11	Net	Covering a food with nets	Medium	Small
12	Log	Giving a log with bark and a diameter over 20 cm	Large	Large
13	Wine straw	Giving low straw	Small	Small
14	Tied silage	Tying silage with hemp ropes	Small	Small
15	Opening for fan	Placing pellets inside the opening for fans	Large	Small
16	Opening for fan with pet bottle	Mixing a pet bottle with food inside it at the opening for fans	Large	Medium
17	Straw	Mixing food inside a pile of straw	Medium	Medium
18	Chopped silage	Scattering finely chopped silage	Medium	Medium
19	Flavored water	Putting flavors like honey, salt, or mud in the drinking water	Medium	Small
20	Hiding food	Hiding food	Large	Medium
21	Hiding food (balloons)	Hiding food in high places using a step ladder	Large	Large
22	Leg feeder 3	Making a hole on a hanged leg and placing food inside it	Small	Medium
23	Large food	Giving food without chopping it into pieces	Y	Small
24	Small hose of fire extinguisher	Placing food inside a narrow hose	Large	Medium
25	Straw doll	Placing food inside straw tied with hemp ropes	Medium	Large
26	Cushion hose	Placing food inside matted hose	Medium	Medium
27	Chocolate	Hiding chocolate	Large	Small
28	Chopped cabbage	Scattering finely chopped cabbage	Medium	Small
29	Raisins	Placing raisins inside log feeders or pet bottles placed in the opening of the fan	Medium	Medium

【Slide 10】

First, we chop whole apples and carrots into small pieces; the right and the left piles have the same amount. First, we increased the number of feeding stuff. This is the menu. There are a lot of options, but I will skip this since it is too detailed. [slide 9] [slide 10]

This is how it is done. We place the chopped food on top of the bars of the cages. We place the food in many different spots like this. Then, Kenny looks for the food with her nose. You can see that there is a carrot by the side, and you can see how she searches for the food with her nose to eat. Sometimes, I use the ladder to hide the food in high places; I have a big smile on my



【Slide 14】



【Slide 11】



【Slide 15】



【Slide 12】



【Slide 16】



【Slide 13】



【Slide 17】

face here. This takes a lot of time and effort, so we do this twice a week. [slide 11-14]

There is a moat, and we make a lot of glazing-bars below the moat, and we place the food in this manner. Above is the sleeping room for the elephants. The elephants will stretch out its nose like this. The elephants cannot see this area, so they would be relying on the smell to search for the food with their noses. [slide 17]

The pet bottle is being filled with food in this slide. It is a bit embarrassing, but this is how it goes. [slide 18] [slide 19]



【Slide 18】



A ♪^: :>.:w:w: : A



A ♪^: :>.:w:w: : A



A ♪^: :>.:w:w: : A



A ♪^: :>.:w:w: : A



A ♪^: :>.:w:w: : A

It is a bit difficult to see, but there is a duct for the fan, and food is being placed inside [slide 20].

We place things such as pet bottles and peanuts in there. Then the elephants suck with their nose or blow on it and take out the food a little by little to eat. We sometimes put in raisins as well. [slide 21]

These are fire hoses, and they are filled with food. There are about three sizes. We close one end of the hose with a bolt to stuff the hose. When we do this, it is a bit difficult to see. [slide 21] [slide 22]

Can you see that the elephant is holding a fire hose with the tip of its nose? The hose contains hay cubes,

but the elephant flings around the hose like this to take out the food to eat. [slide 24]



【Slide 24】



【Slide 27】



【Slide 25】



【Slide 28】



【Slide 26】



【Slide 29】

This is a mat made from the fire hose that I just showed, and we stuff food into the space between the hose. This is a cardboard box filled with hay and chopped food. We do things such as placing it with the lid closed. [slide 25] [slide 26].

This is a hemp sack. We simply put food inside the hemp sack. This is a paper bag. Similarly, we put food inside the paper bag as well. This is pasture grass, but we wrap nets like these around the pasture grass. We call this a straw doll; we tie the straw with rope made



【Slide 30】

from hemp and we put food inside the straw. Then the elephants rip this to take the food out to eat.

[slide 27-30]

This is a bit difficult to do, so we have not done this recently, but this is how we use the tire. We use the tire as a place to hide food like this, not as a toy. [slide 31] [slide 32]

This is the log. For logs with diameters over 20 centimeters, the elephants just peel the bark off to eat. If the log is narrower, the elephants eat all of it. They lift the log like this or shave the bark off with their tusks to eat. After this, Chi dropped the log in the pool,



【Slide 31】



【Slide 32】



【Slide 33】

and I remember having a difficult time retrieving it.

[slide 33] [slide 34] [slide 35]

This is a twig about as wide as a human arm with a diameter of no more than 10 centimeters. The



【Slide 34】



【Slide 35】



elephants will eat twigs like this. The elephants will tear up all of the twig to eat it. Like this, if the twig is large, the elephants will stretch it, break it, and make a crunching sound as they eat it. [slide 37-] [slide 38]

When we get sugarcanes, this is how we give them to the elephants. I think that the elephants are surprised when their food tastes different. [slide 39]

We think that the elephants will be angry when we keep on feeding them small potatoes, so we try to feed them large ones every so often. The elephants really like chocolate as well, so we buy chocolate like this to give to them. [slide 40] [slide 41]



【Slide 39】



【Slide 36】



【Slide 40】



【Slide 37】



【Slide 41】



【Slide 38】



【Slide 42】

In this slide, food is being buried. When we do this, there is always a lady who calls us asking why we bury the food. When this is broadcasted on television, we apologize every time. [slide 42]

This is a log feeder. This is what we were using until a while ago; I think that you can tell that there is a small hole, and that is where we stuff in a little bit of peanuts. The one on this photo – this is a new one that we have made recently – is shaped like a dice so that we can use all six sides of the feeder. [slide 43]

The elephants roll the feeder like this to take out the peanuts to eat. [slide 44]



【Slide 43】



A ʘ^: :».:w:w: : A



A ʘ^: :».:w:w: : A

Recently, the crows have become smarter, and they take the food that Kenny has left. So we also contribute a lot to the enrichment of crows. [slide 45]



A ʘ^: :».:w:w: : A



A ʘ^: :».:w:w: : A

This is log feeder number 3. It is long and narrow; the elephants do not roll this, but instead, when food is put into this the elephants lift it up with their noses, bang it on the floor to shake out the peanuts, and eat the peanuts that fall out. Thus, this one is used slightly differently compared to the one I showed before this. [slide 46]

This is used hanged, and this is similarly flung around with the nose to get the food out. [slide 47]



A ʘ^: :».:w:w: : A



【Slide 49】



【Slide 50】



【Slide 51】



【Slide 52】

We hide the hay cube in dents on the wall like this.

Then, Kenny looks for the hidden food with her nose like this. [slide 48] [slide 49]

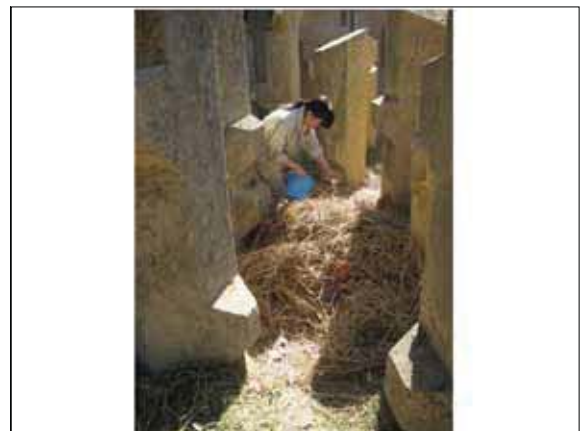
In this slide, we are placing food in high places. This is about 5 meters high, so the place is quite high up. We caution each other as we do this saying that it is dangerous if we fall off. The elephants stretch out their noses and search for food as they eat. The elephants cannot see this area, so they search very carefully like this. [slide 50-52]



【Slide 53】



【Slide 54】



【Slide 55】

We tie pasture grass like this with hemp ropes. If the pasture grass is long, there is a ladder here so we place the grass inside the ladder. [slide 53] [slide54]

This is a pool of rice straw. The elephants seldom eat the straw, so we hide things like apples in this way. This is the place where we provide drinking water. We have two drinking areas for the elephants, so sometimes, we do not touch one area and flavor the other with things such as honey, salt, and also mud. We try to change the flavor of the water. [slide 55][slide 56]

This is just rice straw. The elephants will eat it if you feed them this once every so often, so we sometimes try to change the flavor with things such as different types of dried hay and twigs of trees that they do not usually eat. Here, we chopped cabbage and scattered it on purpose. [slide 57-59]



【Slide 59】



【Slide 56】



Slide 60】



【Slide 57】



【Slide 61】



【Slide 58】

This is our newest equipment called log blocks. We have a lot of sliced log pieces, and we stick in food between the pieces of logs. Then the elephants use their forehead or noses to lift the log up to take out the food. Here, you can see a little bit of something like a carrot. We fix this once during lunch and once in the evening – twice a day – but it takes a lot of effort. [slide 60] [slide 61]

This is a video of the area for exercising. I am going to pause the video for a second, but right now, the elephant is using its nose to look for food. The characteristic of the elephants in our zoo, as people

from other zoos tell us, is that they are laid back and that they move slowly. The elephants move slowly like this as they search for food. Here, the elephant is looking for food on top. [slide 62]

The video continues like this, so I will skip the rest.

Next is a slide regarding the recent condition of the indoor area. This is also a video. We also put effort into being creative indoors, like we do for the outdoor area. Here, right now, the elephant is sucking out food from the duct and eating it. First, the elephant sucks out food placed in the area that it can reach. When the elephant can no longer reach for the food, the elephant starts releasing and eats the food making a rolling sound. Food is also hidden in the area where the door is, and here, the elephant is looking for it with its nose.

This is inside the duct. I think that you can see a pet bottle. It is around the nose. In a while the elephant will release it. We carry out enrichment in many places, but generally we always have hay ready for the elephants so that they can eat it any time whenever they want to and so that they can eat as much as they want. Here, right now, the elephant is picking up the stuff on the ground. At first, the elephant frequently



【Slide 62】



【Slide 63】

dropped its food, but nowadays, the elephant skillfully picks its food up. This day, we placed the food high up, so the elephant is also stretching its nose to reach up and search. The video will continue like this, so I am going to go ahead and skip it. [slide 63]

行動観察による評価

方法

- チーとケニーの放飼場における行動を観察によって評価した。
- 行動観察は訓練を受けた動物園のガイドボランティアによっておこなった。
- 観察方法は1分間のタイムサンプリングで1セッション1時間として、天気に関係なくランダムに観察した。
- 1ヶ月10時間以上の行動観察を目標とした。
- 2005年11月～2006年10月の1年間を集計した。
- 比較のためエンリッチメントのない給餌(1回、2回)の場面での行動観察も同様に行なった。

【Slide 64】

[slide 64]

Evaluation through observation of behavior

Method

- Evaluating the behavior of Chi and Kenny through observation in the area where they are let out.
- The observation of the behavior was conducted by trained guide volunteers of the zoo.
- The method of observation was a one minute time sampling. One session was one hour, and observation was conducted randomly regardless of the weather.
- The goal was to observe their behavior over 10 hours per month.
- Data was collected from November 2005 to October 2006, a one year period.
- For the purpose of comparison, the behavior during feeding time without enrichment (once, twice) was also observed.



【Slide 65】

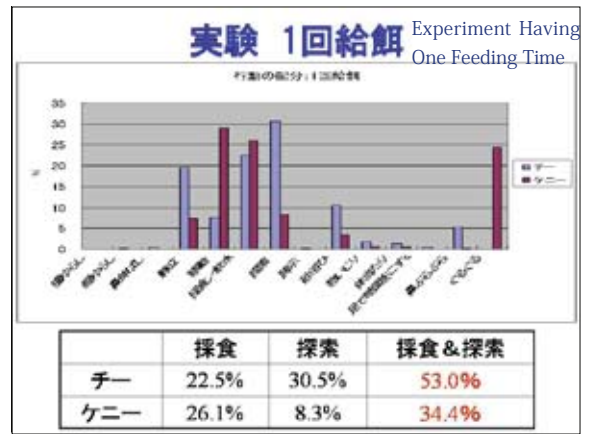
We conducted many things in this way, and with the cooperation of Dr. Ueno, we conducted an evaluation through an observation of their behavior. Here, I am only going to show the part in the area for exercising, because this is where it is the easiest to see the observation of the behavior being conducted. We also had the volunteers of the zoo cooperate. We summarized the data collected over a one year period. [slide 64]

For comparison, we also looked at the feeding time without enrichment. We observed the elephant being fed once and twice – both the same amount of food. We researched the behavior of the elephants in these situations as well. This is a scene where a volunteer is observing the elephant. [slide 65]

As a result, putting aside the details, if you can take a look at the part that says “foraging” and “searching” you can see that the elephants were observed to exhibit these behaviors approximately 73% to 75% of the time. [slide 66]

When the elephants were only fed once for experimental purposes, with Chi foraging/searching was exhibited over 50% of the time, but you can see that stereotypic behaviors, such as turning in circles and dangling its nose, were exhibited frequently. [slide 67]

This is the results when we had two feeding times. You can see that the elephants were feeding/foraging 48% and 32% of the time. As a result, when comparing the conditions of having only one feeding time and



- Turning in circles
- Dangling nose
- Rubbing ground with feet
- Hurling oneself
- Exploring things
- Sand bathing
- Self-assertive behavior
- Searching
- Foraging/drinking
- Moving around
- Standing still
- Stretching nose
- Swaying vertically
- Swaying sideways

	Foraging	Searching	Foraging/Searching
Chi	22.5%	30.5%	53.0%
Kenny	26.1%	8.3%	34.4%



[slide 68] Experiment Having Two Feeding Times

- Turning in circles
- Dangling nose
- Rubbing ground with feet
- Hurling oneself
- Exploring things
- Sand bathing
- Self-assertive behavior
- Searching
- Foraging/drinking
- Moving around
- Standing still
- Stretching nose
- Swaying vertically
- Swaying sideways

	Foraging	Searching	Foraging/Searching
Chi	36.0%	12.7%	48.7%
Kenny	24.0%	8.68%	32.6%



【Slide 66】

- Hurling oneself
- Exploring things
- Sand bathing
- Self-assertive behavior
- Searching
- Foraging/drinking
- Moving around
- Standing still
- Stretching nose
- Swaying vertically
- Swaying sideways

	Foraging	Searching	Foraging/Searching
Chi	49.5%	23.9%	73.4%
Kenny	59.6%	15.8%	75.5%

まとめ

- ・野生のアフリカゾウは、1日のうち18時間(75%)を採食行動に費やすといわれている。
- ・単純に比較することは出来ないが今回の取り組みと観察方法によって、放飼場においては、採食及び探索時間の割合を73.4%~75.5%にすることができた。
- ・環境エンリッチメントが採食及び探索時間を長くする効果があることがわかった。
- ・常同行動を減少させる効果があることがわかった。

【Slide 69】

Summary

- It is said that African elephants in the wild spend 18 hours a day (75%) foraging.
- It is difficult to make a simple comparison, but with the activities that we engaged in and the observation method that we used, we were able to have the elephants search and forage for 73.4% to 75.5% of the time.
- Environmental enrichment has the effect of extending the time for searching and foraging.
- It also became clear that it has the effect of decreasing stereotypic behaviors.

having two feeding times, more stereotypic behaviors were observed and the time taken for foraging was shorter when we had two feeding times. So, having two feeding times yielded results that were not so good. If you would like to know more details, please ask Dr. Ueno later. I think that this is a very interesting result. [slide 68]

To summarize, African elephants in the wild spend approximately 18 hours foraging. Keeping this in mind, it is difficult to make a simple comparison, but with the activities that we engaged in and the observation method that we used, in the areas for exercising, we were able to have the elephants foraging for approximately 75% of the time, similar to the time spent in the wild.

The results showed that environmental enrichment has the effect of extending the time that African elephants engage in searching and foraging. It also had the effect of decreasing the number of stereotypic behaviors. [slide 69]

As you can see, this is the summary of the results. [slide 70]

結果のまとめ

上段エンリッチメント実施
中段1回給餌
下段2回給餌

	採食	探索	採食&探索
チー	49.5%	23.9%	73.4%
ケニー	59.6%	15.8%	75.5%
	採食	探索	採食&探索
チー	22.5%	30.5%	53.0%
ケニー	26.1%	8.3%	34.4%
	採食	探索	採食&探索
チー	36.0%	12.7%	48.7%
ケニー	24.0%	8.68%	32.6%

【Slide 70】

[slide 70]

Summary of results

Top: enrichment carried out

Middle: having one feeding time

Bottom: having two feeding times

	Foraging	Searching	Foraging/Searching
Chi	49.5%	23.9%	73.4%
Kenny	59.6%	15.8%	75.5%
	Foraging	Searching	Foraging/Searching
Chi	22.5%	30.5%	53.0%
Kenny	26.1%	8.3%	34.4%
	Foraging	Searching	Foraging/Searching
Chi	36.0%	12.7%	48.7%
Kenny	24.0%	8.68%	32.6%

「食べる」以外のエンリッチメント

Enrichment other than "eating"

【Slide 71】

One activity that is very important to the life rhythm of the elephants in the zoo is mud bathing. We have made mud bathing areas like this. The elephants – this is Kenny – bathe in the mud in this way in the area that we have created. The elephants are generally engaged in this activity once every day throughout the year whether it is winter or summer. The elephants bathe



【Slide 72】



【Slide 73】



【Slide 74】



【Slide 75】

like this and put mud on their stomachs. When the elephants get excited, they lie down like this; I think that when they do this, their backs look very sexy. [slide 72-76]



【Slide 76】

泥浴びの効果

- 悪癖である糞浴びの抑制
- 冬季の皮膚の乾燥の予防
- 夏季の直射日光の遮断
- 展示としての効果

なんか楽しそう！
精神的な効果も期待できるのでは？

【Slide 77】

[slide 77]

The effects of mud bathing

- Breaks the bad habit of bathing in stool
- Prevents the skin from being dry in the winter
- Blocks direct sunlight in the summer
- Effect on exhibition

The elephants seem to be enjoying!

Can we also expect some effect on the mental state of the elephants?

The following are the effects of mud bathing. Until now, the elephants had a bad habit of rubbing their own stool onto their bodies, but by monitoring the area for mud bathing throughout a year, this bad habit disappeared. In the winter, this prevents the skin from drying up. In the summer, it helps the elephants deal with the heat. Also, from the perspective of the

visitors, the dynamic movement of the elephants is very effective. [slide 77]



【Slide 78】



【Slide 79】



【Slide 80】



【Slide 81】



【Slide 82】



【Slide 83】

Putting these points aside, the elephants seem to be enjoying themselves. So I think that we can also expect some effects from the aspect of the mental state of the elephants. Sometimes, the elephants are unable to bathe in mud, because the zoo keepers need to check the area for mud bathing, and on these days, the elephants seem somewhat restless.

For mud bathing, we simply go to the mountains to get mud, because the mud is consumed as the elephants bathe in it. This takes a lot of effort. Other than this, the elephants also bathe in sand like this. The elephants also go into the pool like this to bathe in water. The elephants soak completely into the water like they are soaking in hot springs, and they look very relaxed. [slides 78-83]

Other than this, we use this fire hose that is about a little more than two meters long. Inside the hose is a normal metal chain. The elephants take this and hit their backs with it to itch their backs. It is not that bad now, but in June, the skin of the elephants starts peeling. There is a period where the skin molts. During these periods it seems like the elephants feel itchy all over, so you can see them often flinging this onto their

backs as they move around.



【Slide 84】



A ♪^: :>.:w:w: : A

Currently, we also have the elephants listen to music. There is such a thing as music therapy, but in our zoo, we often have the animals listen to the radio. This is done to have the animals get use to the sound from outside or to shut out the sound from outside. We were also using the radio for the African elephants, but we heard that Mozart was good for music therapy, and we decided to try Mozart. So, we started playing Mozart. However, Mozart was very unpopular, so we changed



A ♪^: :>.:w:w: : A

the music to African music. This is very upbeat.

[slide 85]

Other than this, for the purpose of exposing animals to other smells, we place the stool of other animals. To the left is the stool of a black rhinoceros; we place things like this inside the exhibition of elephants. Also, in the freezer is the stool of Asian elephants; it is frozen for preparation. We sometimes place things like these. [slide 86]

So what kind of effects does this have? This is where Kenny is sniffing the material. She seems like she is thinking hard, but we still have not figured out the effect of this. [slide 87]



A ♪^: :>.:w:w: : A



A ♪^: :>.:w:w: : A

We are currently putting a lot of effort into interaction with people and communication. We value simply touching the elephants. This is because, especially now, we only have one female elephant. For African elephants that live in herds in the wild, it is very stressful to live alone. Being in charge of the elephant, I frequently feel that elephants should not be kept alone. However, since we have only one elephant, I want the zoo keepers to cover for this and heal her.

I have heard that simply touching the animal is good for animals that live together. So we include training

for touching, and we do training for the purpose of touching them. We also increase the number of times that the elephant interacts with people in such ways like increasing times that the elephant is hand fed. In the future, we would like to increase the interaction with the elephant through training

Japanese crane sticks its head into the water like this to look for the fish. [slides 91-94]

**Enrichment of Japanese cranes
タンチョウのエンリッチメント**

チョーさん オス
1995年6月
東山動物園生まれ

1日1回ツル用ペレット、オキアミ、ワカサギ、小松菜を給餌していた



Cho-san male
Born June 1995 at Higashiyama Zoo
The crane is fed pellets for cranes, britt, lake smelt, and Komatsuna (*Brassica campestris* var. *peruviridis*) once a day

【Slide 89】

Next, if I have some time, I would like to move on to talk about Japanese cranes.

This is the Japanese Crane that we keep at our zoo, and this is the video clip of the crane.

This is before enrichment was carried out. There is food, fish, britt, pellets, and Komatsuna, placed in one corner, and mealworms, larvae of beetles, are scattered. The crane is picking up the scattered mealworms. You can see that there is nothing. So the crane was eating like this. Even during its feeding time, the crane was wondering around moving between the feeding area and the drinking area. [slide 89]

So, this is what we did. First, we released live fish into the pool. If we release live fish, the crane will catch it immediately.

So we made places for the fish to hide by placing blocks. So, the fish hide between the blocks, and the



【Slide 91】



【Slide 92】



【Slide 93】

環境エンリッチメントの紹介



Introduction of environmental enrichment

【Slide 90】



【Slide 94】



【Slide 95】



【Slide 96】

We also decided to scatter mealworms in leaves and on the base of trees so that they would hide. We also made a pool of leaves.

When we scatter the mealworms onto the leaves, the Japanese crane digs through the leaves with its beak to look for the mealworms hidden between the leaves. [slide 95] [slide 96]



【Slide 97】

Until now, we were using partitions made with wooden boards, but we changed these to partitions made with bamboo. Japanese cranes love the small gaps, so they peck at the small gaps. Japanese cranes dig the soil as well. Japanese cranes especially like

these gaps, so we thought that they would start digging if we placed a log with a small hole in it. So, we also placed something like this. [slide 97] [slide 98]



【Slide 98】



【Slide 99】

This has a really cool name to it, but what it does is it collects insects and flies. We put elephant stool inside this pet bottle. Then, we thought that it would attract flies and the crane would try to catch the flies. However, the flies did not fly nicely, and it was not very successful. [slide 99]



【Slide 100】

This is the environment that was made by carrying out enrichment. I think that the exhibition looks better with the plants too. [slide 100]



【Slide 101】

I have a video clip here. Here, the crane is looking for the scattered mealworms. I think the crane has better movement and has a face of a hunter now. Here, the crane is looking into the leaves.

Here, the crane is searching for the fish released into the pool. The fish are hiding in small spaces, so the crane sticks its beak and looks for them. By carrying out these enrichments, I hope that you can tell that the movement of the crane has changed. We also conducted behavior observation for this, but we are unable to present the detailed results here.

As a result, the time the cranes foraged and searched for food increased. I cannot tell you how much the time extended. There was a drastic change in the time the cranes took to rest, or when they are sleeping. The time was decreased by approximately 50%. I personally thought that in cases of birds and Japanese cranes that do not exhibit stereotypic behavior as much as other species, the amount of time they take to sleep may increase. [slide 101]

エンリッチメント=展示方法 Enrichment = Method of Exhibition

No! いいえ!

動物の福祉のために行なうことです。
Enrichment is carried out for the welfare of animals.

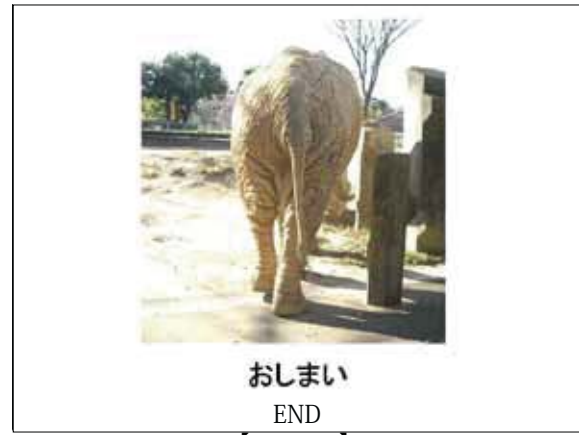
彼らの生活の24時間を考える必要があります。
We need to consider all the 24 hours of their day.

一般の方には見えない部分(室内など)の環境が重要であることをご理解ください。
Please understand that the environment that cannot be seen from the public visitors (such as indoor areas) is important.

皆さんのご理解が動物園で暮らす動物の福祉を向上させることにつながります
Everybody's understanding will lead to the improvement of the welfare of animals living in zoos.

【Slide 102】

So to summarize, enrichment is not the equivalent of exhibition methods. I think that enrichment is entertaining for the visitors as well, but enrichment is



おしまい
END

【Slide 103】

not a method of exhibition.

So, enrichment is simply for the welfare of animals – that is, it is what you do for the animals. Thus, because enrichment is carried out for animals, it is not for the visitors. So we must consider the parts that cannot be seen by the visitors, such as the indoor areas where the visitors cannot see and the times when the zoo is not open like the holidays.

I believe that I pay attention to these points when I carry out enrichment.

So, if these aspects must be considered when thinking about enrichment, I would very much appreciate it if the visitors could understand that these places behind the scenes are the important parts. This is because the time that the visitors can see is at the most 8 hours during the time when the zoo is open; but we must be aware of the fact that the remaining 16 hours is longer than the time that the zoo is open.

So, please understand that this time is necessary for the animals.

What this means is that when designing a new area for the animals, we may use a lot of money for the indoor area or we may allot a lot of space for the indoor areas where the visitors cannot see.

This is often the case, but I think that zoos in the future will change in this way. I would like the visitors to understand that this may be the case. The understanding of everybody will change Japanese zoos in the future; internationally speaking, zoos in Japan are behind.

I think that the understanding of everybody will improve the welfare of animals living in zoos. To summarize, I think that it is the understanding of everybody that will be the key to the improvement of

the welfare of the animals.

My presentation may not have been very interesting, but you will find it more interesting if you look at the actual elephant or the Japanese crane. So, please visit the Higashiyama Zoo. Thank you.

○ Yoshikazu Ueno

Thank you very much.

Are there any questions regarding the presentation? Please.

○ Questioner

I was able to understand that the zoo keepers at the Higashiyama Zoo are being very creative and putting a lot of effort into carrying out enrichment.

Is there something like a textbook, and is the idea to use a model to develop what you are doing? Or are you basing your activities on results of scientific experiments like those of Dr. Mason, and are you applying the results in considering what types of activities you are carrying out? This is my first question.

The other question that I have is regarding the elephant that was in a poor condition; I think that it was an elephant in Noge-yama Zoo. I live close by, and I feel bad looking at an animal that has a wide range of activities being locked up in a small cage and going back and forth. There are these zoos on one hand, so I think that models developed by zoos like Higashiyama that are putting effort into carrying out enrichment should be spread to other zoos in Japan. Are there any movements regarding this area, and are there any forces of resistance that becomes a barrier for such movements?

○ Tetsuya Suzuki

That is a very difficult question for me to answer. First of all, basically, there are no textbooks regarding enrichment. I think that if you search, there are theories, but as a person in practice, I think that cases should be considered case by case by looking at the zoo, the practice, and the individual animal. I think that consideration by people who see the actual situation will be more effective. However, related to the other question, I think that I would like to spread our activities to other zoos.

In Japanese zoos, there is an elephant meeting where

zoo keepers in charge of elephants gather. I present what our zoo has done in meetings like this. A lot of the zoo keepers that have been in charge of elephants have been in the post for a long time, but a lot of these experienced zoo keepers and also the younger generation are usually very interested in what we do. They think that things we do are very good ideas, and I hear them say that they want to engage in these activities.

However, partly because of the effort it takes, these activities cannot be done individually, and it needs to be done as a team. So I think in this way, it is spreading on the individual level, but it is difficult to spread on the organizational level. However, I think that this will change from now on. Does that answer your question?

○ Yoshikazu Ueno

Are there any other questions? Can we move on?

Then, let us take a 10 minute break and go into general discussion. It is ten past right now so we would like to begin at twenty past. Thank you very much.

○ Yoshikazu Ueno

Now it is time so we would like to start the general discussion.

As mentioned in the first part of the workshop, this workshop is on enrichment. However, this does not mean that the workshop only deals with the technical aspects of enrichment. Issues regarding the welfare of animals, the purpose of enrichment, and issues regarding the method of exhibition also came up in the workshop. As Mr. Suzuki and Mr. Horii mentioned, enrichment in itself is not a technique for exhibition. Enrichment is a technique used for the purpose of improving the welfare of animals. However, this is indivisible from techniques of exhibition, and it must be carried out as a set in zoos. Thus, enrichment must be carried out in close relation to exhibition. Also, for visitors, they do not necessarily need to be aware of the division; the fact that animals are behaving the way they should be is meaningful. There are three ways of viewing enrichment based on this meaning. It would be great if we can discuss our opinions and ideas from this perspective.

You can address your questions and comments to any