



Electronic edition of the Museum Guidebook

## HOME

## Welcome to the Osaka Museum of Natural History

The Museum focuses on the themes of the diversity of nature around us, the acknowledgement that nature has been cultivated over a long span of time, and the close interactions between changes in nature and us, mankind. The culture of us, human beings, strongly reflects influences from nature. At the same time, changes in cultures of human beings may change forests or swamps into bare hills or rice paddy fields, and conversely, bare hills may become forests, and farmland may change to factories. Human activities and nature are inextricable from one another. With this in mind, the theme of the permanent exhibition at the Museum of Natural History is "Story of Nature and Human Interaction."

We hope that you will recognize or discover a lot of things in the Museum. Beyond the impact of the large Naumann's elephant and Allosaurus, which might leave a strong impression, we hope you can make smaller discoveries that may be an opportunity to observe living things, to face nature, and to review your own lifestyles, from seeing the lives of insects in interesting places or learning how the world of living things works through hands-on games in the 5th Exhibition Room.

The "Nature Square: Nature of Osaka" exhibition room introduces the diverse nature here in Osaka. This section does not display special preservation districts, but show ordinary fields and hills, as well as nature in residential areas. We hope this exhibition becomes an incentive for you to face nature by saying "let's go to that mountain to observe nature," instead of merely leaving the Museum thinking that you enjoyed yourself.

In addition to enjoying nature in Osaka, those who are from outside Osaka may be able to recognize the greatness of nature in your country or area through comparing Osaka's nature with that of yours. It would be wonderful if this is the case. Moreover, understanding nature in Japan can make your understanding of Japanese culture more profound. We hope that you can reconfirm, regardless of regions or countries, the close universal correlation between the activities that people engage in to maintain culture and the activities that preserve nature.

## How to Enjoy the Museum

1. The 1st and 2nd Exhibition Rooms are located on the 1st floor of the main building, and climbing the stairs to the 2nd floor will take you to the gallery for fungi and minerals. At the other end of the building's 2nd floor are the 3rd and 5th Exhibition Rooms, and the 4th Exhibition Room is laid out along the corridor. In the "Information Center for flower, greenery, and nature," is the

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“Nature of Osaka” Exhibition Room, which introduces nature at each location in Osaka and has a space for studying and Q&A. The Special Exhibition is located on the 2nd floor of this information center.

Additionally, small-scale themed exhibitions are occasionally held in the main building, etc. Information on these exhibits can be obtained from the Museum website or from Facebook.

2. Feel free to take as many photos as you want in the Museum’s permanent exhibitions, as long as you do not disturb other visitors. However, please do not conduct flash photography, since it may be blinding to other visitors. We welcome visitors to post and share their memories on SNS. We would appreciate it if you add the hashtags “#osaka\_shizenshi” or “#omnh” to your photos. Using translation apps such as Google Translator may be helpful if you are using a smartphone.
3. When you find something in the Museum that interests you, talk to your friends or family members about it. Your mother or father may actually know a lot about things that you’ve already or never seen before.  
As long as you are not being rowdy or running around, there is no reason for you to be silent when looking at the exhibits. Please enjoy browsing the exhibits of the Museum of Natural History.
4. Talk about what you find and what was enjoyable in the Museum with your family and friends. Talking about Your discovery will cement it in you and everyone’s memories.
5. If you have any questions or if you want to know more about the exhibits or about nature, please feel free to visit the Museum counter. Our expert curators will answer your questions.
6. Drinking from a thermos or a plastic bottle is allowed at the tables on the 1st floor in the Museum, but please refrain from eating and drinking in the exhibition rooms.
7. Please hold onto the ticket you showed us as admission until you leave. As long as you have your ticket, you can go in and out of the permanent exhibition. Return visits to the Museum after a walk to the botanical garden or after eating at a restaurant will be granted as long as it is within the same day. Please use your entire day to enjoy yourself.
8. For those who want to know more about the Museum or to learn about nature, there is the Friends of Osaka Museum of Natural History. Please ask a staff member for more information.
9. The website for the Osaka Museum of Natural History is: <http://www.mus-nh.city.osaka.jp>  
The Museum Facebook is: [https://www.facebook.com/osaka\\_shizenshi](https://www.facebook.com/osaka_shizenshi)  
Our websites are available in several languages.  
The English Facebook page:  
<https://www.facebook.com/osakamuseumofnaturalhistory/>

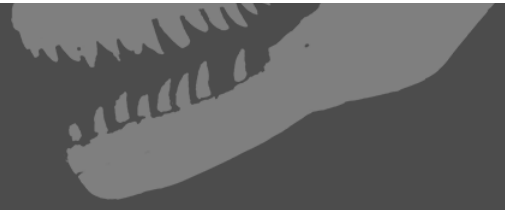


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## Electronic edition of the Museum Guidebook Naumann Hall

## Welcome to the Osaka Museum of Natural History.



The huge elephant in the center of the exhibition hall is the Naumann's elephant, which inhabited Osaka for a long time between 20 to 430 thousand years ago. Footprints of the elephant can also be found here, in the soil beneath Nagai Park. Imagine an Osaka with a sprawling expanse of nature where elephants lived. Naumann's elephants vanished in the era when people started settling in Osaka. Overhunting by humans is thought to be the reason for this. Human activities sometimes make changes to nature. Likewise, we are forced to change our cultures and lifestyles as nature changes. "Nature and humans are inseparable from each other," and therefore, "Story of Nature and Human Interaction" is the theme of the exhibitions in this museum.

The footprints following the elephant and those of the *Sinomegaceros yabei* were faithfully reproduced from those that were excavated underneath the Abikominami Junior High School located south of Nagai Park.

- ▶ [Go to detailed explanation of the exhibition](#)
- ▶ [Watch a video presentation by curators](#)

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Electronic edition of the Museum Guidebook  
**1st Exhibition Room**

## “The Nature World Around Us”



This exhibition room is primarily structured around diorama reproductions which depict actual scenes using models and specimens. The scenes depict nature in Osaka, and slowly broaden perspectives from daily examples like the urban lifestyle to nature in suburbs, and to farther examples like nature untouched by humans.

This will be helpful for those who live in Osaka as well as visitors from overseas to intuitively understand the relationship between nature and our lives.

Visitors can enjoy, while browsing, looking for familiar organisms or even discussing differences between what is shown in the exhibition and familiar organisms with those accompanying them.

For those who are from overseas

All organisms have their generic names and scientific names. Universal scientific names are given to prevent confusion due to there being multiple generic names for each organism. The universal scientific names, which are in Latin, are displayed at each exhibit. You will be able to search these names to look for a closely-related species around you.

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## 1-4 Nature of country forest



Country forests surrounding farmlands which are used for firewood and charcoal are called "SATOYAMA." This is a space inhabited by a variety of organisms despite being utilized by human beings for hundreds and thousands of years. Nature in SATOYAMA is explained in detail in the 5th Exhibition Room.

▶ [Go to the exhibition](#)



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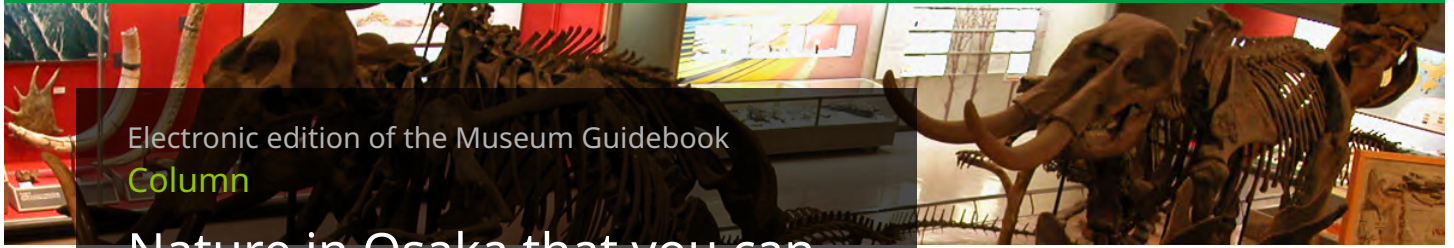
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Column

## Nature in Osaka that you can learn in the Museum

The Nature of Osaka Exhibition Room, Naumann Hall, the 1st Exhibition Room and half of the 2nd Exhibition Room are all good resources to understanding nature in Osaka.

When thinking about how Osaka's nature was formed, Osaka's positioning on the earth is greatly significant. The Japanese islands are situated on the edge of the Pacific Ocean, and are hugely impacted by seasonal winds. This means that Osaka is a place that receives large impacts from the change of weather and coastal lines as a result of repeated ice ages and warmer ages in between the ice ages (interglacial stages) during the past 2 million years.

During cold ages, the sea level lowers due to large developments of inland glaciers, and results in Osaka Bay becoming broad land and Osaka becoming an inland area. In warmer ages, the ocean conversely expands into areas that are currently plains. In addition to these conditions, changes in seasonal winds greatly change the temperature and amount of rainfall.

Nature over the ages that have undergone great changes from climate and shifts in the coastline, such as nature during the era in which Naumann's elephants were thriving, forests which nurtured acorns for people in Jomon era, whale bones that were buried under the ground of the plains introduced near the entrance of the 2nd Exhibition Room (the age of Kawachi Bay), and swamp vegetation during cold times, are all pieces of a puzzle that fit together to form our current nature. Organisms living during warmer ages and colder ages survived in various places in Osaka, all of which formed this diverse nature.

Another item of importance when looking at Osaka's nature is how significant human activities are. From the ancient to modern ages, the area where Nara, Osaka and Kyoto are situated was a location where capitals were established; and even after that, this area continued to be home to important cities in Japan. Meanwhile, the surrounding farm villages were engaged in production to support these cities in addition to producing food, firewood, and charcoal for their villagers. For this reason, humans intervened in the condition of fields, mountains, and rivers, and nature in Satoyama, which is grassland with an abundance of sunlight and shallow water instead of deep forests, was formed over the course of 1500 and more years. Various changes happened during this period, but the length of time in which people interacted with nature led to Osaka's special characteristics with respect to its landscapes and biota.

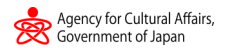
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It is not true that current city areas with skyscrapers are devoid of living things. There are many immigrant species from overseas in cities, as well as native species such as the *Cryptotympana facialis* (a type of cicada) whose population has increased. Though there are immigrant species that inhabit cities all around the world, these species also have individual characteristics specific to each city. The blaring *Cryptotympana facialis* during Osaka summers may be one of the more unique traits in the world.

Nature in cities is the most familiar type nature to its inhabitants, and especially to children. Taking an interest and looking at them closely may lead to new discoveries or to learning something new.



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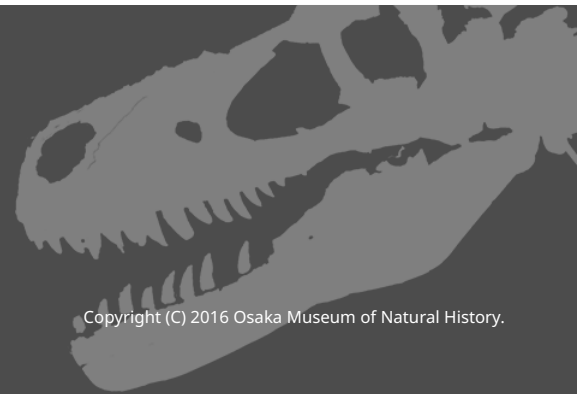


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**2nd Exhibition Room**

## “History of the Earth and Life”



Exhibits in this room are laid out in chronological order going back into history, which you can travel from current to ancient times. It starts from nature as we know it now to nature at the end of the Last Ice Age, then even further back to the age of mammals and gradually to much older times. Let's expand your imagination and think about the history of life forms from long in the past, bit by bit, to a little bit back in time from the familiar organisms of today.

The large skeletons in this room are “replicas,” which are scientifically faithful resources that have been molded from actual specimens. They are not fake, but an important reference that can be used for research.

Don't miss the cast shadows on walls and the section under the staircase on the 1st floor.

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- ▶ [Watch a video on skeleton restoration by a curator.](#)

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3rd Exhibition Room

## “Evolution of Life”



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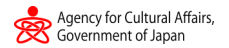
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There are about 8,000 specimens in this room alone. They are mostly all real, except for some, like the human skeletal reconstructions. Various beautiful to tiny insects, seeds and fruits full of gimmicks by the plant, various forms of marine life, and mammals with various kinds of teeth are displayed. You'll be able to experience how diverse the forms of organisms are.

The Museum of Natural History stores as many as 1.6 million specimens of natural history, and it selects only the best one percent of them for its permanent displays.

Many of the specimens are for research, and the museum sometimes opens them to the public in special exhibitions.

- ▶ [Go to detailed explanation of the exhibition](#)
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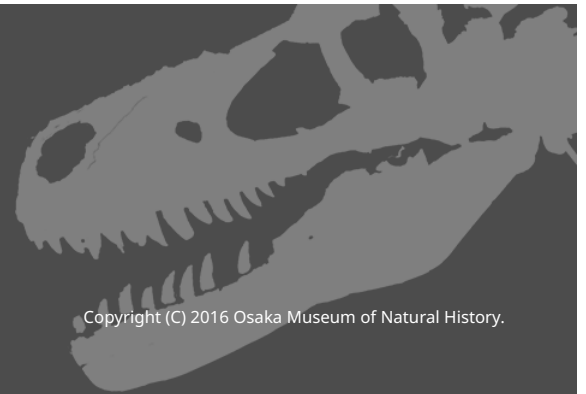


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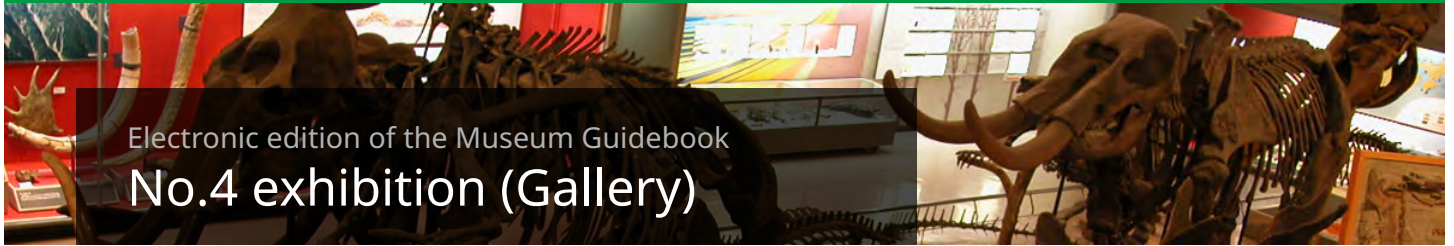
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## “Nature’s blessing”



Salad, bread, rice, dessert, and a wide variety of produce are something humans have improved over a long period of time from wild breeds of plants. This section shows which part of the world’s wild plants are the origins for our current plants. Your dinner today should give you an understanding that you are eating the blessings of the world’s nature.

▶ [Go to detailed explanation of the exhibition](#)

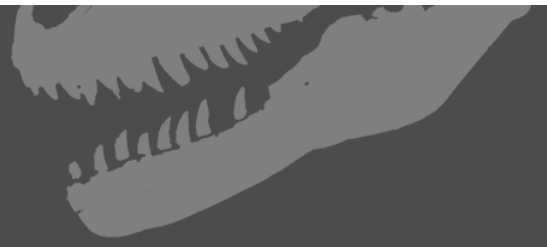
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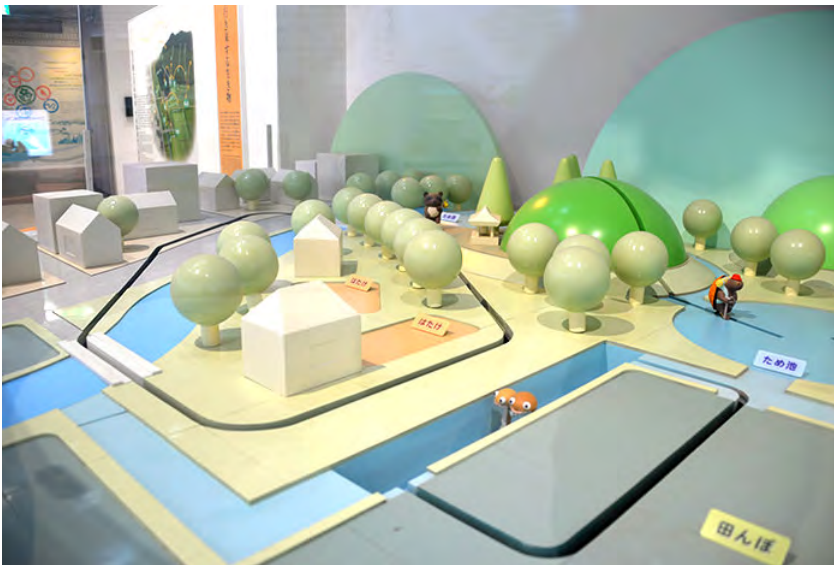
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**5th Exhibition Room**

## “The Lives of Living Things”



Living things live by influencing and being influenced by each other in the course of multiplication, migration to other places, eating other living things, being parasites, or coexisting. Some creatures that live in paddy fields migrate to reservoirs or rivers. How environments combine around the environment that organisms live in, as well as the structure of surrounding towns impact the lives of organisms. Furthermore, observing how insects, birds, and fish that travel long distances live provides some insight to the fact that environments in East Asia are broadly connected.

This exhibition room is designed so that children can learn, through games and interactive models, the hidden principle in the lives of living things. Adults are also welcome to try these activities themselves, or to gain an understanding through watching the children play and provide them with explanations.

- ▶ [Watch a video presentation by curators](#)
- ▶ [Watch a video presentation of an island biology game by a curator.](#)
- ▶ [Go to detailed explanation of the exhibition](#)

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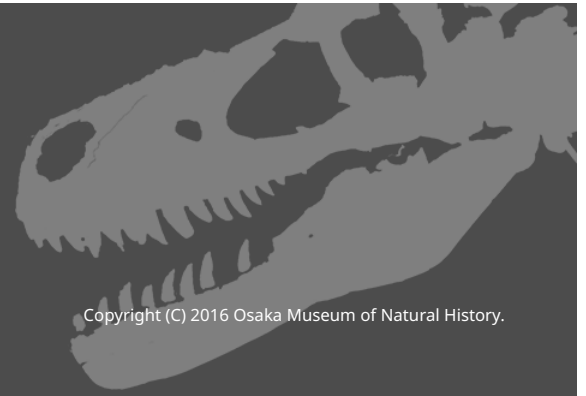


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## Learning about organism diversity and about mankind in the Museum

The exhibits in the 2nd Exhibition Room show the path that living things followed in the course of evolution. The 3rd Exhibition Room displays the different insects that inhabit each part of the world, and shows diversity through displays of individualized habitats of organisms which live in a shared area. The 4th Exhibition Room presents today's dinner full of vegetables, crops, and fruits that have been selected from many plants which have undergone such evolutions. Finally, the 5th Exhibition Room displays the mutual influences that these organisms have on each other, and influences that human activities such as city-building and agricultural and forestry work have on living things.

Humans are also members of an ecosystem. There is a relationship between organisms living in paddy fields or waterways. Water circulates from mountains to the ocean, evolutionary passages are completed over a long period of time, movements on a global scale, and various circulation loops exist either in units of short or long periods of time, or in units of small or large magnitudes. In current times, are human beings incorporated in the mechanism that supports this loop? And how do human activities affect this circulation? Human activities have global impacts. How should we live our lives and maintain the earth so that our children or grandchildren can enjoy nature and diverse organisms?

We hope that the Museum can provide you with some hints when considering these things.

### For those who want more information on the Museum

Explanatory materials and books are sold in the museum shop. However, these are only available in Japanese. There are also many publications regarding each individual exhibit. Please ask the shop attendants or staff if you require any of these references.

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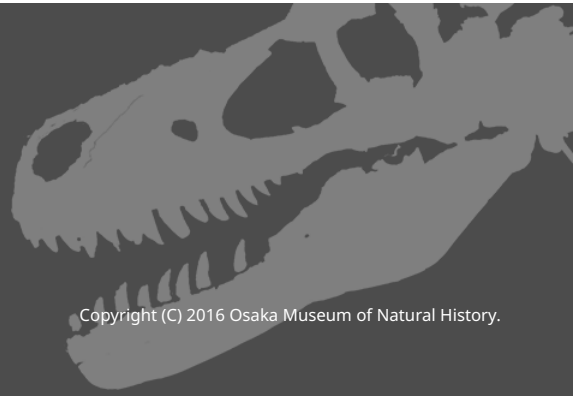


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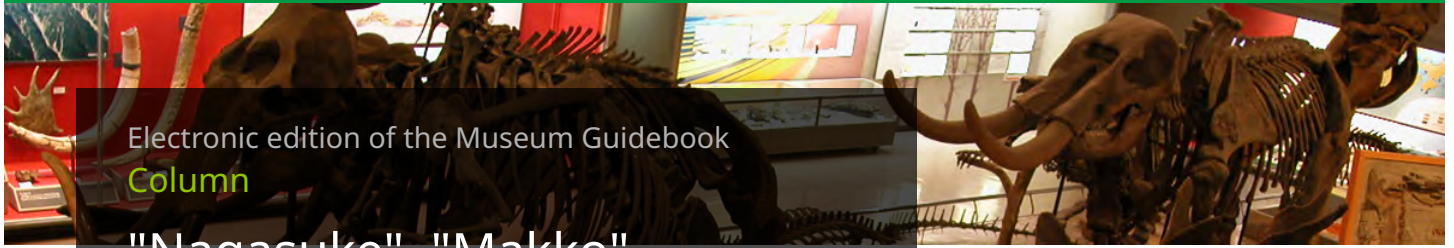
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"Nagasuke", "Makko"



## Finback whale "Nagasuke"

This sample is made from a carcass that was washed ashore on April 8, 1990, and it took us 7 years to turn it into a skeletal preparations. Although finback whales live in ocean all over the world, there have only been a few cases where their carcasses were washed ashore since they mostly swim off coast. The town of Osaka is covered with man-made artifacts. However, it seems like this finback whale is telling us that the sea of Osaka is also connected to the great nature where whales swim. This skeleton is 19 meters long, and is the largest specimen in whales that have been collected and exhibited in the waters near Japan.

The name "Nagasuke" was chosen from various names suggested by the museum visitors.

## "Makko," the sperm whale that drifted onto Osaka Bay

Since March 6th, 2014, the skeletal specimen of "Makko," a sperm whale, has been displayed in this Porch next to the skeletal specimen of "Nagasuke," the finback whale.

On May 22nd, 2010, the carcass of a sperm whale was found floating near the Sakaisenboku Port. It was a 9.1 meter long, approximately 10 ton female. It had 22

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teeth on the left side of its lower jaw, and 24 on the right side. It had teeth on its upper jaw, but most of them were buried in its flesh and could not be seen at the time of dissection (Diagram 1). The long, thin notch on the very front of its upper body on its leftmost side is its nostril (Diagram 2). A defining characteristic of sperm whales is their asymmetrical heads.

The Osaka Museum of Natural History dissected this sperm whale and brought it back to our facility. Then, we buried it in sand and created skeletal specimen. The full skeletal specimen was unveiled to the public in 2013 for the special "Osaka Bay – A Cornucopia of Marine Life" exhibition, and as a result of asking citizens of Osaka to submit a name for it, it became known as "Makko."



Supported by the Agency for Cultural Affairs, Government of Japan in the fiscal 2017



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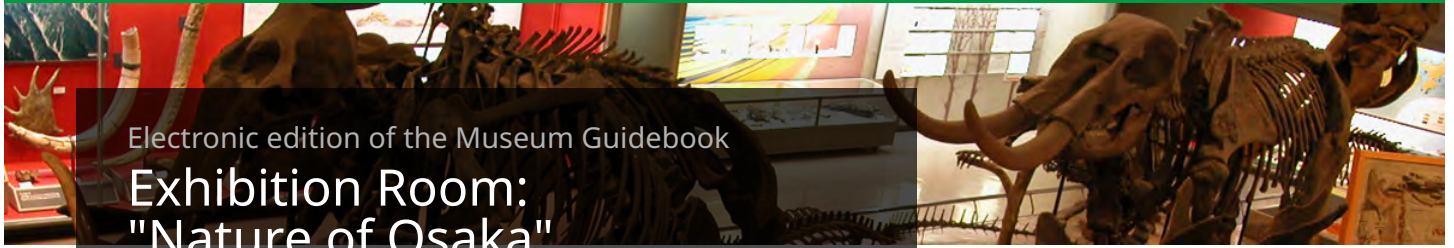
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Electronic edition of the Museum Guidebook

## Exhibition Room: "Nature of Osaka"



This exhibition shows where each organism lives in which part of Osaka. Along the wall are the mountainous environments in Hokusetsu, Ikoma, and Izumi, which surround Osaka. The Yodo River runs through the middle of the room, and is surrounded by nature in the Osaka Plains; in between them, there are exhibits of nature in hill lands and farmlands. Some of these places are likely familiar to you. If looking at the exhibits in this room peaks your interest, why don't you try looking in the nature around you? If you find something mysterious or something you don't understand, feel free to visit the Museum again.

- ▶ [Watch a video presentation by curators](#)
- ▶ [Go to detailed explanation of the exhibition](#)

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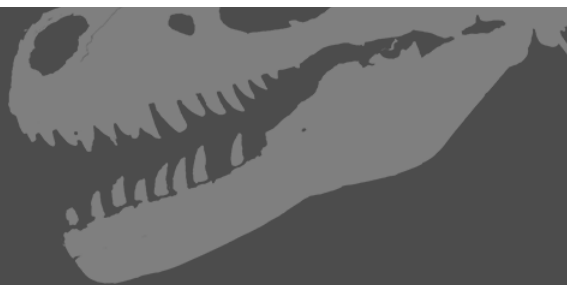


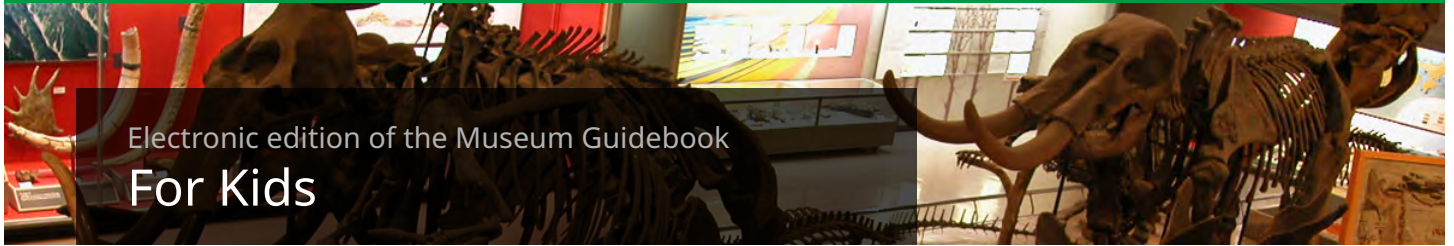
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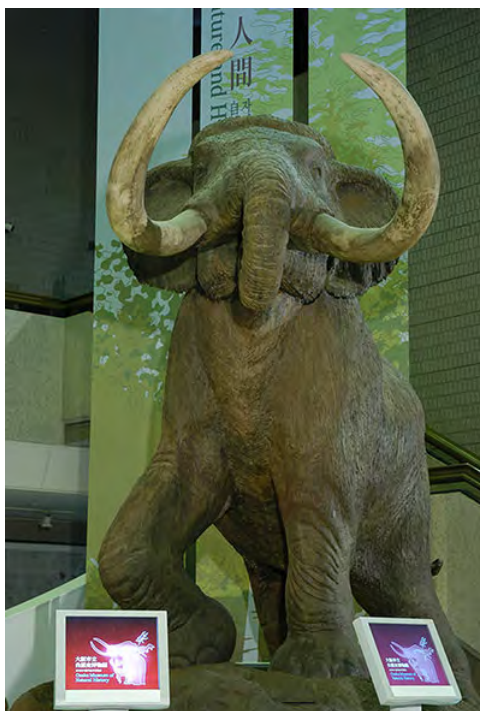
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## Naumann's elephants existed in Osaka!



Naumann's elephants lived in Japan until 20 thousand years ago. Footprints and pieces of their teeth were found near the Museum. Maybe people in Osaka way back in time hunted Naumann's elephants.

### Were there elephants in Osaka too?

A long time ago, big elephants were clumping around Osaka.

These are fossils of those elephants' teeth.

What we found from the uderground us amazing stories of ancient Osaka.

### When Naumann's elephants walked...

There are strange patterns on the floor. These are elephant footprints.

Naumann's elephants walked around in Osaka a long time ago.

How long were their strides when walking? We reproduced them with the help of fossils footprints.

## Sanukite

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Ancient people made knives and spearheads out of this stone. Touch it gently, so as not to hurt yourself.

The surface, which was exposed to rain and wind for a long time, is rough, but the inside of the stone is very hard and fine. The tip of the broken piece is very sharp. People from the Old Stone Age and the Jomon period who lived in Setouchi region including Osaka made knives, spearheads, arrowheads, and other tools from broken pieces of this stone. Sanukite was a necessary and important material to make tools for hunting and cooking during the Stone Age, when metals were not being used. This stone was named because a lot of it was found in Sanuki (Kagawa prefecture, now). It is distributed along the shoreline area of Setonaikai inland sea, and can also be found in Mount Nijozan. It is called Kankan-ishi because of the clear sound it makes when it is hit.

## Secrets of cockroaches

When did they appear on earth?

Wow, it was 300 million years ago.

They were on the earth way before humans. They can climb straight up walls, eat anything, run fast... They have many strong traits.

How many kinds of them are in Japan?

There are about 50 kinds of cockroaches in Japan, in woods and homes. They love people's homes because it's heated and warm! There are about 6 different types of cockroaches that live in our homes.

How many eggs do they lay?

Have you ever seen cockroaches holding something at the tip of their bellies?

That is an egg bag, and it holds about 30 eggs.

They say that the number of eggs that a single female lays in her lifetime is 200 to 600!

## What did people eat, a long time ago?



This is a storage for acorns! They say that burying them keeps them fresh until next spring.

Acorns were important food for these ancient people

## Fossil of a finback whale (jawbone)



This is a whale's jawbone. Can you see the hole on top? This is a hole that nerves passed through. These whales had no teeth.

## The Machikane-wani crocodile



Four hundred thousand years ago, when people were not living in Osaka, these big crocodiles were walking around.

When people were building university school buildings in Toyonaka city, they found small pieces of bones. Then, after digging there 4 times and doing research, they found bones of an 8 meter long big crocodile. It was named the Machikane-wani crocodile after the name of where it was found: Machikane-yama!

## Sinomegaceros yabei



This fossil was found in a cave in Gifu prefecture. Big deer like this lived in Japan 10 thousand years ago.

I wonder if ancient people hunted Sinomegaceros yabei?

## Naumann's elephant fossil (jaw bone)



This fossil was found from the bottom of the ocean floor. A fisherman caught it in his net when he was fishing.

Isn't it surprising that we had such big elephants in Japan?

## Boom, goes the volcano!

A long long time ago, there was a volcano near Mount Nijozan in Osaka! After it erupted, many kinds of stones were created. What do they feel like? Try and touch it!

## What do you look like?



What's this? There are 2 animals with the same name. This animal is called the Desmostylus.

It was very mysterious back when we found it, because it didn't look like any other animal. So a lot of different people studied it. At first, we thought it looked like the way it does on the left, but we think that it's supposed to look like the one on the right.

Compare the differences in body shape of these two.

## Coal

Coal is made from ancient plants. We used to use coal to run trains and to fuel heaters about 40 years ago. I wonder how a black rock like this can have so much energy.

## Ammonite

Ammonites used to live in the ancient ocean. They are extinct now, and we aren't able to see it anymore. Touch it gently.

This specimen is a fossil of a kind of ammonite called Eupachydiscus, and was found from a ground layer in Hokkaido dating to the Upper Cretaceous period (about 85 million years ago). The inside of its shell was separated by a type of wall called dissepiments. Specimens like this fossil with scraped outer shells sometimes have complicated curves that look like mum leaves. These curves exist at the intersection of dissepiments and outer shells, and are called suture lines. Since dissepiments are not flat and intricately crooked, these curves are formed.

## Apatosaurus footprints



Apatosaurus are very huge dinosaurs. Its body was 20 meters long and they weighed 30 tons! Put your foot into their footprints and compare them. How many times bigger are they than yours?

## Touch the dinosaurs' fossils

These are real fossils of dinosaur feet bones. They were found in Africa. The owner of these bones must have been a gigantic dinosaur.

## The world of minerals



Look at these many twinkling beautiful stone-like chunks!  
Many minerals exist on earth. The things we need in life, like kettles or 10 yen coins, are made out of minerals. If you make jewelry out of beautiful minerals... you can make rings and necklaces!

## Black quartz (quartz)



Beautiful stones, aren't they? Hexagonal crystals have gathered to see which is the tallest.

Try touching the smooth parts.

The shape of the crystals is very orderly, and looks like a party hat with a hexagonal cone on top of a hexagonal column. The crystal face is flat, but if you touch it, it feels rough. This is because first, a big crystal was formed, and then the small crystals formed on top of its face. The smaller crystals are also the same shape as the big crystal.

## The earth is full of bugs!



Where do bugs live?

Do they live in the sea? I wonder if there are bugs in Antarctica, too?

Are they also in poop?

## Seeds with big wings



This is a dipterocarp seed. It has big wings. Dipterocarps are big trees that grow in the tropics. They can grow up to 50 meters tall. What do you think will happen if this seed falls from such a high place? Press the button to find out!

## If they find you, surprise them!

When a butterfly gets found by a bird, the butterfly flashes its big, round eye-like design on their wings to surprise it. Then, it runs away while the bird is surprised. Let's see the eyeballs beneath their wings. Press the button to take a look!

## The biggest crab in the world



This is the world's biggest crab: the Japanese spider crab. When it spreads its limbs, it becomes as big as 3 meters wide. They live in the ocean near Japan.

## Huge clams in the South Pacific.



Huge clams live in the South Pacific Ocean. The giant clam is the biggest bivalve in the world.

The Australian trumpet shell is the biggest conch in the world.

## Where did the plants that we eat come from?



This section has a lot of plants. Which part of the world did the vegetables and fruits that we eat come from?

## Banana seeds

Have you ever seen a banana seed?

The bananas that we eat don't have seeds, but they say that wild bananas in tropical mountains do.

We think that bananas are fruits without seeds, but wild bananas have impressively big seeds. The reason why cultivated bananas don't have seeds is the same reason why seedless watermelons don't have seeds. They are both triploids.

## Roly-poly acorns





Oaks grow a lot of acorns every year, don't they? Many of them fall, but they don't all grow to be oaks. Acorns have to survive bugs, birds and animals that try to eat them before they can sprout. Can it succeed in sprouting without any problems?

Roly-poly acorns... what happens to them?

This acorn is a baby of a konara oak. Even though many were born, not every single one of them can sprout. Some are chewed on the inside by bugs, and others are eaten by animals. Sometimes, fungi or mushrooms grow on them. What other living things do the acorns that get rolled around by us see? Can they roll to the finish line and sprout successfully?

## Will the mushrooms grow? Come out, mushrooms!

What kind of places do mushrooms grow out of?

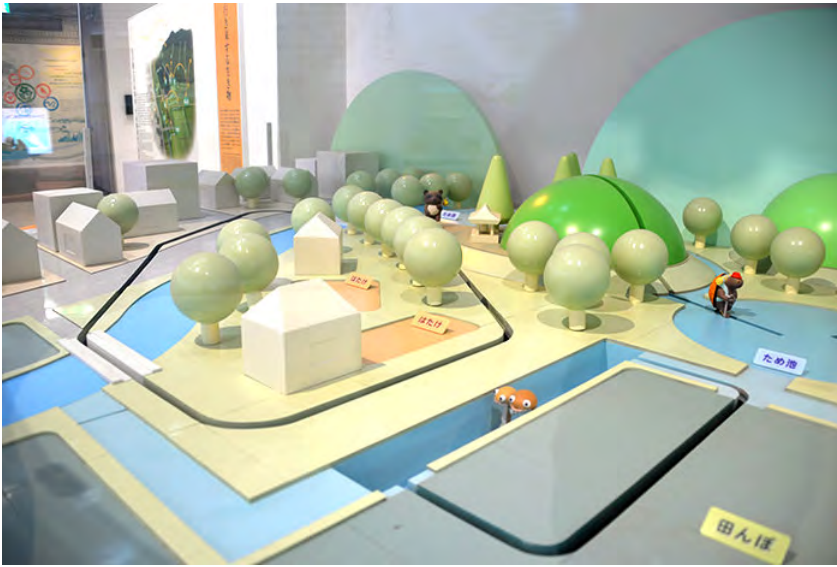
Mushrooms don't appear just anywhere. They have places that they prefer. Can you make mushrooms grow by gathering the places that they like?

Matsutake mushroom, small tree, Japanese red pine

Honey mushroom, healthy roots, Konara oak, Plum, etc.

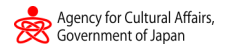
Fomitopsis pinicola, weakened trunk, Japanese red pine, fir, etc.

## Nature in Satoyama



This is just on the outskirts of town. There are many environments like mountains and woods, rice fields, and ponds, so many living things besides humans are here, too. How do they live? Press the button to make the living things start moving. How do they live during the fall and winter? Are there any early birds? Does anybody go out at night? Do they go out to eat? What are they going to do?

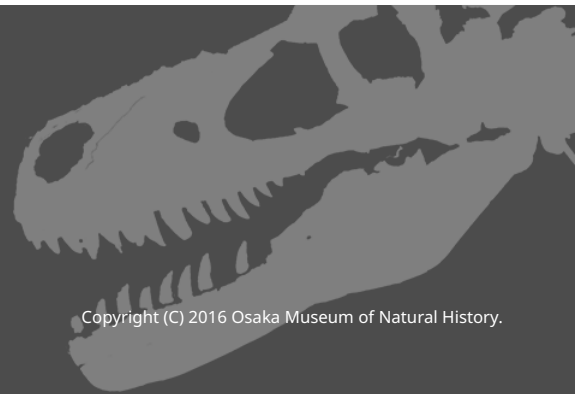
Every time you press the button, you will see how these living things move around in the morning, during the day, and at night, in spring, summer, fall, and winter. An explanation will be projected onto the front wall.



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