

# Forty Years of Ingenuity at the Sunshine Aquarium

Tsuneo Arahata

Former Director of Sunshine Aquarium, Japan

**ABSTRACT:** Sunshine aquarium opened in 1978. It attracted attention by being installed in a skyscraper 40 m above the ground.

40 years have passed since the opening, but during that time, we have tried and errored in order to continue the aquarium, and have changed in various ways.

I would like to talk about various ideas that the aquarium has had.

## INTRODUCTION

A major feature of the Sunshine Aquarium is that it was installed on the roof of a skyscraper 40 meters above the ground in 1978. (Fig.1.)

It was a revolutionary idea. It was seen by the world with surprising eyes, but even more surprisingly, though, 40 years have passed since this establishment. I do not see other examples in the world.

At the time of the installation, many people thought the idea was absolutely impossible. But Horike believed in his idea and as the first director of the Sunshine Aquarium he gathered the building technology along with the equipment and materials needed.



Fig. 1. Sunshine City complex

## FULL TEXT

Initially, even though searching everywhere, we could not find a large acrylic tank especially one with a strong enough reinforcement frame with a 15 meters frontage. (Fig.2.)

Also, with Acrylics, we made a special “Diamond Cut” and “Wine Glass” shaped tank that would be good for living things. (Fig.3.)



Fig.2.



Fig.3.

The urban environment without the surroundings, securing the seawater was more difficult than collecting living things.

The problem of securing seawater was solved by systematization of the seawater supply and development of filtration equipment to purify the water.

The seawater is collected off Hachijojima from the ballast of the ship and brought to the port of Tokyo Bay. (Fig.4.) We transfer 24 tons from the ship to the tank truck, and land transport it to the aquarium.

The seawater is transferred to a basement water reservoir. This underground reservoir is waterproofed to prevent groundwater contamination and can store 350 tons.

The seawater in the underground reservoir is transferred to an elevated tank on the roof 60 meters above the ground using a huge pump. This elevated tank is 10 tons in size.

From the elevated storage tank, it is a system that can be supplied by a natural waterfall through pipes to each tank. (Fig.5)



Fig.4.



Fig.5.

The piping material used in the aquarium is lightweight and rust-free. Polyvinyl chloride is used.

The use of a Filter was indispensable in the high-rise aquarium where we can not use sea water abundantly. A pressure type rapid filter demonstrates great power in a narrow aquarium.

The advantage of having a fast filtration speed and a small facility area is that it matched the high-rise aquarium.

When we first opened the aquarium, the visitors just stared and seemed bored. So we released and displayed:

An inventory of all the animals in the Tank with pictures.

We described the special behavior of each fish.

And we started performances by divers feeding fish.

We showed the different reactions of the fish like pulling, popping and swimming through a ring with conditioning lights. (Fig.6.7.)

We started using a female guide to introduce fish habits and ecology. These features were popular.



Fig.6. Popping



Fig.7. Through a ring

The show using sea lions was released for the purpose of introducing the characteristics and habits of animals while showing various tricks.

The animals that appeared were South American Sea Lion (*Otaria flavescens*), and California Sea Lion (*Zalophus californianus*). (Fig.8.)

There are two ways to organize the show, and it can be divided into a story show introducing it in a comical theater style, and a sports show introducing various actions of the sea lions. (Fig.9.)



Fig.8.



Fig.9.

Both of them introduced the high level of exercise and ecology functions of sea lions, and the visitors were surprised.

The performance by a diver is a fish feeding show.

It is a show with a female diver in a bathing suit feeding the fish in a tank that displays fish living in the temperate zone, centering on the White Trevally (*Pseudocaranx dent*). (Fig.10.)

This show introduces fish while showing the fishes unique movements and cute feeding scenes. (Fig.11.)



Fig.10.



Fig.11.

The creatures on display are collected from all over the world. In anticipation of the times, I always tried to exhibit precious collections. I will introduce some of exhibited organisms.

5 kinds of Garden Eel

(*Heteroconger hassi*, *Heteroconger polyzona*, *Gorgasia japonica*, *Gorgasia taiannensis*, *Gorgasia preclara*).



*H.hassi*



*H.polyzona*



*G.japonica*



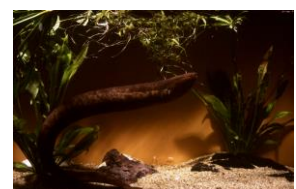
*G.preclara*

6 kinds of Lungfish

Australian Lungfish (*Neoceratodus forsteri*), South American Lungfish (*Lepidosiren paradoxa*), African Lungfish (*Protopterus aethiopicus*, *Protopterus annectens*, *Protopterus dolloi*, *Protopterus amphibious*).



*N.forsteri*



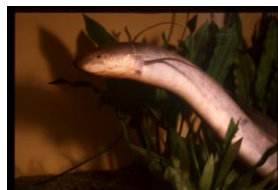
*L.paradoxa*



*P.aethiopicus*



*P.annectens*



*P.dolloi*



*P.amphibious*

Sunfish (*Mola mola*), Sea Angel (*Clione limacina*), Sea Otter (*Enhydra Lutris*), Weedy Sea-Dragon (*Phyllopteryx taeniolatus*), Mexican Salamander (*Ambystoma mexicanum*).



*M.mola*



*E.lutris*



*P.taeniolatus*



*C.limacina*

And so on.

However, as the times have progressed, organisms around the world can be seen in any aquarium. Creatures that could only be seen in specific places became general exhibits. Just to display only the creature, the management of the aquarium had to become more creative.

After that the exhibition method shifted to an ecological exhibition aiming at simultaneously displaying various creatures and the environment where they live.

A tank which reproduced the natural environment which was cut out of one frame of natural scenery was made. (Fig.12.13.14.)



Fig.12. World's three largest reefs.



Fig.13. Amazon basin



Fig.14. Mangrove

The creatures that played the leading role in aquariums reproducing the natural environments were not only fish, but also included small mammals, Family of Aves, Family of Reptilia, Family of Amphibia, and so on.

34 years since the opening of the building, The Sunshine Aquarium will be renewed in full.

The reason for the renewal was that we felt that the facilities are getting old and we asked ideas for changes from customers for a new exhibition.

A new attempt was an idea that mainstreamed a "behavior exhibition". Always being able to see actions that living things do not in normal reality really show.

For example, The Longheaded Eagle Ray (*Aetobatus narutobiei*) is a scene that explores baits by digging in the sand at the bottom of the ocean. (Fig.15.16.)



Fig.15.



Fig.16.

Next is a scene where large fish interrupt and attack the herd of Japanese Sardines! (*Sardinops melanostictus*). (Fig.17.)

Next is a special tank that allows you to observe the California Sea Lion from directly beneath and realize the wonder of its swimming ability. (Fig.18.)



Fig.17.



Fig.18.

In addition, a special exhibition hall held at the venue next to the main building was variously devised. I will introduce two examples.

Collaboration with artists.

It is a contrasting exhibition of numerous works which have Goldfish (*Carassius auratus auratus*) made with acrylics as the main character alongside genuine living Goldfish.

The contrast between the goldfish created with acrylics that captured the instant and the lively

goldfish with fluid movement was an interesting project. (Fig.19.20.)



Fig.19.



Fig.20.

Collaboration with the author.

An interesting and curious introduction from an amateur's eye by the author. And, as seen from curators, there are introductions that are serious and uninteresting. Visitors were able to enjoy the commentary on exhibited organisms in two ways. (Fig.21.22.)



Fig.21.



Fig.22.

### SUMMARY

When thinking about long-term management, the attitude that always introduces new things is necessary for the operation of the aquarium. While having the difficulty of the aquarium on the higher floor, we have used much devised ingenuity.



Sunshine Lagoon



Underwater Performance

How to respond to customer's needs and how to express it is largely due to the results of curators and the keepers thoughts and efforts.

It is a great driving force for curators and caretakers to develop a workable environment that will exert their power as a mediator between customers and exhibited organisms as well as growing the aquarium as an attractive facility.

In the future Sunshine Aquarium will continue to develop and provide "Discoveries that will inspire you "as an aquarium closer to the living things.

We wait to welcome you at the Sunshine Aquarium.



Penguins in the Sky

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