

## Talking about zoos, animal well-being and education with Jon Coe



Philadelphia Zoo ©

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It was 1966, when Jon Coe was a student at the Harvard University Graduate School of Design and looking for a thesis subject. He was visiting Boston's Franklin Park Zoo with classmates for an art class. That's where he observed three chained elephants fighting with each other. Jon asked a nearby keeper, "Why are the elephants fighting?" The keeper

replied, “Because they are chained up.” Jon continued, “Well, why are they chained up?” The keeper retorted, “Because they are fight”.

Thus began the emergence of zoo exhibit design based on the integration of animal behavior and well being with a focus on ecology and habitat landscape design.

Philadelphia Zoo is currently implementing a zoo-wide Transformation Plan that provides more exciting and enriching experiences for the Zoo’s animals. Through the development of an extensive animal travel and exploration trail system, animals are allowed to travel across the Zoo’s campus. Treetop Trail was the first of the three trails making up the system to open, followed by Great Ape Trail in built in 2012 and extended in 2015. A third trail for large hoofed animals is being designed for next year. (See at <https://www.youtube.com/watch?v=Zq4HjpoHxkk>).



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Let’s talk about your job in Philadelphia Zoo “treetop trails” ...How did the idea of constructing these air corridors start?

I started with the ideas of Dr. Heini Hediger, the father of Zoo Biology. He wrote “Psychology of animals from zoos and circus”, first book of animal behaviour in zoos, and many others important books such as “Wild animals in captivity”.

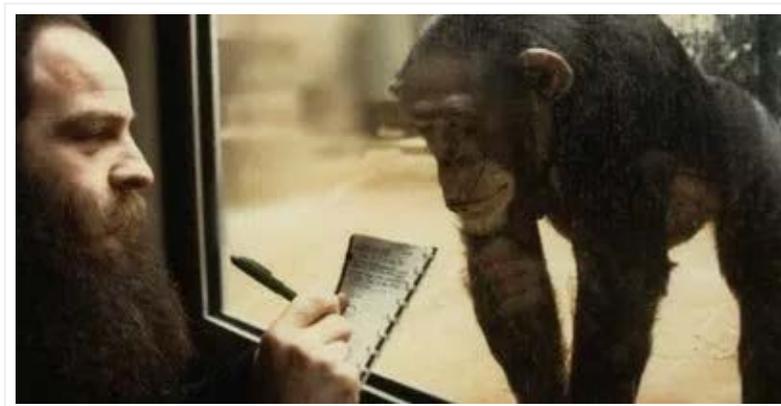
Professor Hediger talked about the animal’s natural habitat, and the way the territory is set up. The territory is not just a big space, but also a network of trails animals habitually use to reach functional areas such as food and water resources, dens and rest areas. So animals may not actually use many areas within their territory. In a zoo you do not need a big area, but you need lots of trails. And in nature these trails in the forest are used by many different animal species. This can be considered a time-share system.

So that gave me the idea: Why we don’t we hook up all these old cages and enclosures with these trails creating a network that many different animals can use at different times?

So we are actually copying natural behaviour.

“An animal’s natural territory is not so much an area of land or water, but rather a network of trails connecting key resources.”

Jon Coe



Jon Coe ©

Once you have already constructed it...How animals react? Do they use it?

First of all, the zoo started with the small primates. The tree top tunnel is about one meter of diameter and they have 13 kinds of primates that use it. That has been really successful and is pretty well documented.

Keepers didn't force them to go into the overhead tunnel system, the animal's are given time to explore at their own pace.

For example, there are tiny marmosets that use the whole length of the tunnel, so they have the 500 metres one way and 500 metres back. So the whole trip can be one kilometre long, which is a long distance for a tiny marmoset. They were also spread out (everybody thought that marmosets like to stay close together) but they are completely confident (they have no fear and spread the whole distance).

There was a pair of Titi monkeys and their daughter, and the 2 titis were born in the wild but the daughter was born at the zoo. The 2 adults use the whole trail but the daughter is afraid to go out and she prefers to stay alone rather than to go out with her parents (she's the only primate that will not use it).

There are 2 kinds of lemurs that use it...they take turns; some animals use it in the morning for several hours, others in the afternoon.

Now the tunnel is connected to another primate building where they have other monkeys like colobus, Langur and so...eventually they will also take turns...they can spend a part of the day in one building and another part of the day in another building.

Then medium size trail is partly overhead and partly on the ground and is for big cats and great apes as well. It will eventually be extended to include bears. The first animals using the 60m long Great Ape Trail were the orang-utans and gibbons (they can be together, they both used it) and this year an additional 85m was added for gorillas. Last year the Big Cat Trail (100m) was connected to the tigers and now most of the big cats are using it: tigers, cougars, lions and leopards. Only a jaguar is too timid to use it. The total length now available to great apes and big cats is 245m.



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In order to prevent contamination between primates and big cats ...the cats use it during the cold weather (when the primates can't go out), and the great apes use tunnel during the warm weather. The enclosures are cleaned with high pressure steam during the changeover.

The third kind of trail is for heavy animals and it's being designed right now for Rhino, Zebra, Giraffe, Hippo, and antelope, basically connecting three large existing animal yards and opening up two more areas to them.

Most of the zoo animals seem to really enjoy the trail network, but... can we prove this? Philadelphia Zoo recently received funding for a major study of animal behaviour with the new trail system, so in a year or so we will be getting solid data based upon animal preference studies to help us refine future systems.

Also all of those trails will eventually lead to a new part of the zoo; a really large area of flexible exhibits where animals can take turns, like animals coming down to a water hole to drink. Probably it will have a restaurant there where people can watch them.

This Philadelphia Zoo idea is called Zoo 360 and the slogan is: “As you move through the zoo, the zoo moves around you”. This is an important idea for small zoos that are not able to grow large. The smaller zoos in the cities can use all this park land in between exhibits as animal’s trails.

Going back to the basics is the idea that “Nature is the model” as Professor Hediger pointed out. But nature gives animal’s choice. Right now the keepers decide when they go out, but I hope that in a future they will return to my idea that animals could be free to choose and take turns deciding, using the animal’s RFID microchip identification tags and modern “smart gate” technology as is used in the food production animal industry.



Center For Great Apes ©

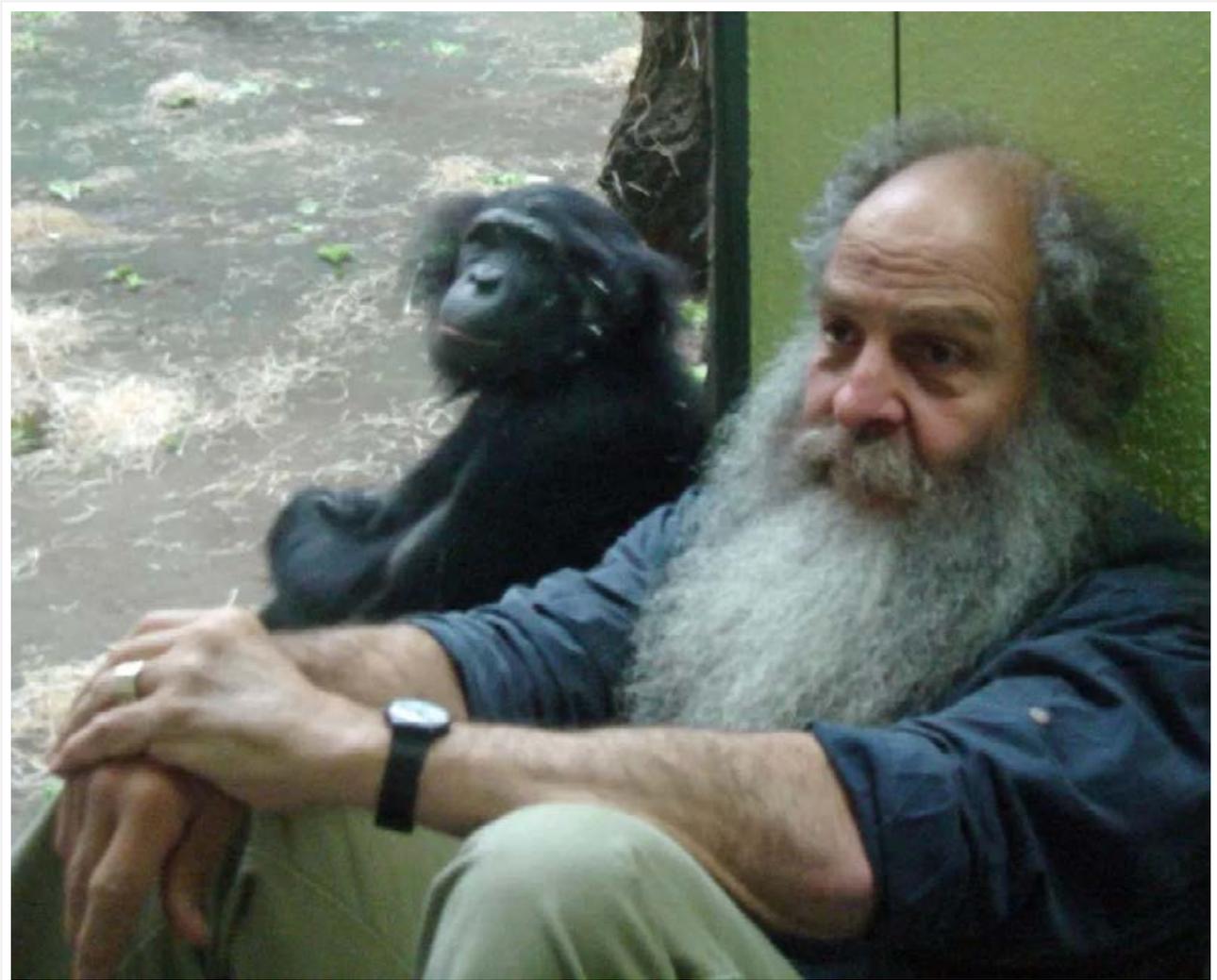
Let’s now talk about humans...How the public of zoos feel when they could see the animals there on the top, walking in these “tree-top trails?”

In talking to the people in the zoo field office, they know that the visitors really enjoy it! This overhead pathways goes parallel to the public’s pathways in many cases, so the kids can

walk alone with them and watch them, following where they go. In the same way, the animals can stop and watch what people are doing. It's actually a really new zoo experience. It does seem spontaneous and no different than watching a squirrel in a tree above you. All the kids watch, so actually works pretty well.

There is another idea that we haven't done it yet but we are working in, it is designing education and information graphics panels. Therefore, using the RFID identification microchips mentioned above, as animals go through the tunnel, an artefact reader will identify the animal and change the graphics of the panel. But at the same time, the same computer will send a message to a research computer creating a map of where the animals are in each moment. In that way, both visitors and researchers could be able to learn about the animal, its behaviour and more characteristics.

These kinds of microchips are being developed just now, and in a future they could give us information about physiological parameters of the animal.



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What are the main problems and oppositions that you find when you start a new project at a zoo?

That's really a good question!

A zoo director may be very progressive and hire a very progressive designer but unless the zoo keepers also cooperate...it won't work. Zoo keepers can be very progressive, but if the leadership don't believe in the idea...it won't work! It comes from both sides.

Occasionally, if I'm feeling a little too confident or a little too arrogant (!j...), at this stage in my life I will tell a zoo director potential client: We can give you this new project at 4 different levels: (1) We can give you a "business as usual", that is what everyone is doing. It's not much risk, it's not much fun and frankly you should ask somebody else to do it because I'm not very interested in that; (2) I can give you a "international best practices" but for me this is an idea that is 20 years old and is finally been recognized widely; (3) Or I can give you what we called "cutting edge" which has only been done by two or three other zoos in the world; (4) Or I can give you "next generation" which nobody's has done yet and you can be the first...And nobody's taken me up on this action yet!

So It is usually between seven and up to fifteen years between a time I want to do some new idea and I get a client that really wants to try it!...Which isn't bad by the way!!

Back to what we were talking about, keeper support for changes, sometimes you design new exhibits with the idea of rotation between different animals, and it doesn't work because the keepers never used! For example, I designed rotation exhibits for a zoo, and the director was very excited with the idea. But at first there was opposition from the great ape keepers (In many zoos I hear "Oh no. We don't need that! , we are fine!" Or, "This is how we always do it! Why risk changing it?"). Sometimes at the end, after keepers in another area of the zoo have successfully used rotation, the great apes keepers were convinced! Now the idea is spreading through the zoo!! But it only happens if everybody in each level supports the project.

Also to do the things that I've tried to do; it really crosses the line between design and management and operation. So I tell the zoo: "You cannot have a 21<sup>st</sup> century zoo with a 1900 century management system". And often they suggest that I stay with design and stay out of the management. But I cannot, because unless the management is modernised and decentralized, and that means training the keepers to a higher level, and then giving them much more authority, these design innovations won't work! ... These are the problems I have. It is not usually the lack of money holding zoos back, but the lack of vision and courage to try new ideas!



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About designing new spaces for great apes ... Which are the main problems you have to solve in designing their spaces???

You can design a beautiful green and natural exhibits for gorillas and they won't do too much damage, but if you put orang-utans there, they will destroy it in one night! It just means that you have to make the story you are telling effective with the method you are using. I might use gorillas to tell the story of protecting nature, because you can present them in a really natural area. I often have people who want naturalistic exhibits for elephants and orang-utans and I say to them that are not going to work! So you have to choose the story that you are going to tell with this exhibit which meets the needs of the animals and can still look good. For example with highly destructive animals like elephants or orangutans you could create a displays which looks like visitors are visiting an animal sanctuary in the animal's home range rather than a destroyed forest area. Or perhaps you design fully modern, functional areas and say "this is how we give these animals the best care possible when their natural home no longer exist".

The second thing that applies to all these animals is something I call "behavioural competence". For many years the zoo biologists have worked to maintain the genetic competence through genetic management programs, to prevent inbreeding and have long - term ex situ reproduction. And they have pretty good budgets for technology and a lot of support. But you can have an animal genetically healthy but behaviourally screwed up. So I say that behavioural competence is as important as genetic competence.

I think that in long-term management and the successful breeding of zoo and sanctuary animals as well as the daily and short-term welfare of these animals, the key is to maintain behavioural competence through training and enrichment. So I have said in some papers that environmental or behavioural enrichment is not simply a nicety that we will like to do, it is just as the central as genetic management. How do you maintain behavioural competence? You would say that for this orang-utan or chimp or bonobo or whatever animal we are talking about, we should set up a fully integrated physical design system and management system including scientific environmental enrichment, so that after generations "they could be returned to the wild". Why we use that benchmark? Because it is

the same that we use for genetic competence, that's why! I don't think most zoo animals can ever be returned to wild areas that no longer exist, but you need some standard, and the standard we don't want is inevitable domestication. So, how do you prevent a long term domestication of great apes...by meeting a standard that allows them to be self-sufficient.

Domestication is a form of applied behavioural incompetence and "learned helplessness" so that domesticated animals can't survive without us, either physically and behaviourally. Some domestic animals like cats or dogs can live and survive in the wild, but many domestic species cannot. So anyway I'm saying that as a standard that means that we have to provide both the behavioural management and the facilities that keeps them physically fit in terms of wild species typical strength, muscle tone and balance, but also in terms of intelligence, problem solving competence and confidence. That's learned and passed on, and this means that these animals have worked for their food, in ways that maintains these physical and behaviour strengths as well as genetic strength. All of this is what we have to design for them.

And that's why that trails are good, because they can walk long distances, they can watch...Competence is based on choice and control. So without control it doesn't matter, what without competence it doesn't matter having all the choices you want if can't get there! So for me it goes all together, behavioural competence, genetic competence and control.

Let's talk about education. Zoo's are supposed to educate people not only in cognitive skills but in emotional one. Normally, here in Spain, visitor's don't have a guided visit, but they are free to visit the zoo, the information panels are old and not attractive to the visitors...I wonder which might be the best way to educate people not only in knowledge but in empathy and respect to the animals...and maintaining at the same time the welfare of the animals.

The paper I wrote in 1985 called "Design and Perception" goes in that direction.

The beginning point is to teach respect and that is done by demonstration, not by saying things. So from the beginning of my work I always tried to place the animal physically above the visitor. And in every language I've been able to test the words "looking up to" ...means the same as respect. And looking down on means the same as disrespect. So when you have the animal in a bit below you, you are being unconsciously taught to disrespect the animal.

When people through rocks or other objects at zoo animals, is almost always the case that they are throwing at an animal below them. I've never seen an example in which people throw objects at animals which are located above them.

So the first thing you have to do is to teach the public with subconscious messages in the way that are natural for humans. So for example, in church the priest is above you, the judge is above you, the teacher...they are always in a "superior" position. But for the person