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David Attenborough's Natural History Museum Alive

By David Attenborough

The Natural History Museum.
One of the most popular
of all London's attractions.
Sometimes it gets so crowded
that it can be quite difficult
to see the exhibits
as closely as you might wish.
Ladies and gentlemen,
the museum is going to be closing
in five minutes,
so please make your way
towards the exits. Thank you.
So it's a great treat if -
somehow or other -
you can manage to look around
when all the other visitors
have gone.
Some of the creatures here
you might - if you were lucky -
have seen in the wild.
But there are certain ancient
animals that we'll never see
with our own eyes...
...because they're extinct.
And among them
are one or two mysterious,
not to say suspicious, characters
that I would like to examine
as they were when they were alive.
'It's a big place.
'There are 70 million or so
specimens here, I'm told.
'And the first I want to look at
right now
'is way up on the very top floor.'
This, some might say,
is the most scientifically important
and valuable specimen
in the whole of the museum.
It's a fossil called Archaeopteryx
and it was secured for the museum
by the first director,
Professor Richard Owen,
back in 1862.

Getting it wasn't easy.
There was a lot of
international competition
and there was a certain amount
of skulduggery
and it certainly cost
a small fortune.
But what kind of creature was
Archaeopteryx when it was alive?
It had two long leg bones,
so it must have stood upright.
A bony tail and a long neck.
Its head had bony jaws packed
with teeth like a reptile's
and its arms had three elongated
fingers, each ending with a claw.
So, you might think it was
some kind of strange,
spindly-armed, upright-standing
lizard.
Except for one fact...
There is evidence of more than
just bones on its slab.
Feathers.
Archaeopteryx lived
some 150 million years ago,
long before the appearance
of true birds.
Those feathers on its arms
certainly enabled it to glide.
But that's not all.
It had powered flight.
Marks on the bones show that there
were enough muscles attached to them
to enable it to flap.
Not only that,
a recent scan of its skull
showed that its brain would've
given it the senses and reactions
that are needed for accurate control
in the air.
This creature was half reptile,
half bird.
It was the first proof that,

in prehistory,
they were intermediate forms
that link the big,
very different groups of animals
that we know today.
But while Archaeopteryx
could certainly fly,
it could also clamber up tree trunks
and along the branches
like a tree-living reptile,
thanks to those clawed fingers.
There were insects flying around
at that time.
And Archaeopteryx's teeth show
that it was a hunter.
And this is Professor Richard Owen,
the man who acquired that fossil
and built this museum.
Although he disagreed with
Darwin's views on evolution,
he was one of the great scientists
of his time
and he had a particular flair
for interpreting fossils.
In 1839, a huge thigh bone was sent
to the museum from New Zealand.
Owen deduced
from its internal structure
that it must have belonged
to a bird.
If so, it must've been a giant.
The Maoris of New Zealand had
stories of giant, flightless birds
that had once roamed their islands,
but Europeans had dismissed them
as myths.
But eventually, Professor Owen
acquired enough bones
of these huge birds to put together
a complete skeleton of one of them.
This was no myth.
The Maoris in their legend
had called it a moa
and Professor Owen in his researches

had proved that it once had existed.
But was it the largest bird
that had ever lived?
There were several different
species of moa,
but this one was the biggest.
It stands 3m tall.
But is this really what it
looked like when it was alive?
You can tell how an animal
holds its head
from the junction between the skull
and its neck.
If that is underneath the skull,
then its neck would have been
upright.
But this moa's neck joint
is at the back of the skull,
so it must have held its neck
more horizontally, like this.
So was the giant moa
the biggest bird
that has ever existed?
Well, if it craned up its neck,
it was almost certainly the tallest.
You might think
that such a gigantic bird
would have no enemies
in the remote and isolated forests
of New Zealand.
Well, there's also a Maori legend
of a huge predatory bird, an eagle,
that existed at the same time.
And what is more,
there are bones to prove it.
This colossal bird
was nearly twice as heavy
as today's most powerful eagle.
Bringing down a giant moa
must have been a huge task.
They, too, were strong and heavy.
But the eagle had
powerful eyesight...
...a beak the size of

a butcher's cleaver...
...and razor sharp talons
as big as the claws of a tiger.
The Greek for grappling hooks
is "harpax".
And that word gives this bird
its name.
This is Harpagornis.
It was a deadly predator.
It was the largest eagle
that has ever existed.
And it lived in the same forests
as the moas.
We know that Harpagornis
preyed on moas
because moa skeletons
have been found
with holes stabbed through
their pelvic bones
that exactly match the grasp
of the eagles' claws.
It was probably even strong enough
to cling to a moa's back
with one foot
while it slashed at its victim's
neck with the other.
But it looks as if this moa
is going to escape - for now.
As well as its millions of specimens
of animals and plants,
the museum also has huge
and fascinating archives,
scientific journals from all over
the world, letters from explorers,
even posters and handbills
if they have anything
to do with natural history.
In the 19th century,
when Professor Owen
was in charge of this museum,
new and extraordinary things were
turning up from all over the world
and Professor Owen was very keen that his
museum should have the best of them.

He secured the Archaeopteryx
from Germany,
the moas from New Zealand,
but sometimes, really strange things
turned up on his very doorstep.
And there were certainly lots
of very odd creatures
being exhibited around London
in Victorian times.
This print shows
an extraordinary monster
that was being displayed
in Piccadilly.
An American showman called
Albert Koch
was charging a shilling a head
to have a look at it.
Professor Owen decided
to investigate.
He felt sure
that something was wrong with it,
but nonetheless, he was intrigued,
and he bought it.
When he'd got it back
to his museum,
he was able to examine it
in detail.
It was certainly gigantic
and bigger than anything else
he had in his museum at the time.
Koch, the showman,
had dug up the bones from
a farmer's field in Missouri
and maintained that in life,
the animal had stood 9 meters long
and almost 5 meters tall.
There were claims that this
was a fearsome predator,
that used its extraordinary tusks
for stabbing its victims,
presumably by swinging its head
sideways.
Well, I'm sure Professor Owen
would've had something

to say about that.
He must have realised
that these blunt, rounded ridges
on these huge molar teeth
would be very effective
at grinding up twigs and fir cones
and rough forest vegetation,
but they lack the sharp blade
that you need
to slice through flesh.
This is not the jaw of a carnivore.
It soon became clear
that Koch had increased the size
of his monster skeleton
by adding extra vertebrae, ribs
and even blocks of wood.
The Missouri Leviathan was a fraud.
So Owen removed all the extra bits.
And then he put the real bones
back together in their true form.
Finally, he detached
those astonishing tusks
and put them back
in the correct way.
It seems obvious now,
but in life,
they had pointed in much
the same direction
as those of a modern elephant.
And so, here today
stands not Koch's leviathan
but Owen's mastodont
a vegetarian relative
of the elephant
that lived 12,000 years ago
in North and Central America.
It may have decreased a bit in size,
but it's still
an astonishing animal.
Our understanding of the mastodon
is a lot more accurate today,
thanks to Professor Owen.
But it was not the only creature
in this museum

to be the victim
of misrepresentation.
This poor old bird is a dodo.
It once lived on the island
of Mauritius in the Indian Ocean
and it's almost certainly
the first animal species
that human beings
actually exterminated
in historic times.
And so now we talk about being
"as dead as a dodo."
But in spite of its fame,
this one is a fake.
Its feathers come from a goose,
its feet were modelled on a turkey
and its beak, I suspect,
is plaster.
The museum can be forgiven
because no skin or feathers
of the dodo survive.
Its image was influenced
by pictures like this one,
painted by a 17th century
Dutch artist, Roelandt Savery,
but he had never seen a living dodo
and based his image
on accounts by seafarers.
I've often wondered whether dodos
actually looked like that,
but unfortunately,
they'd all disappeared
before anyone could get a good look
at them...
...until now.
This funny, dumpy creature
is how the bird is usually
represented these days.
But I've seen quite a lot of
flightless birds over the years
and this one doesn't quite
ring true.
An examination of the way
its thighs join its pelvis

has shown that, in life,
it actually stood much more upright.
We now know that its feathers
were probably a lot fluffier
than in that painting.
We also now know that it
was related to the pigeon
and some experts suggest that
it made a pigeon-like call -
"Doo-doo, doo-doo" -
which gave the bird its name.
The dodo probably fed on fruit -
there's a lot of it on the island.
I'll try him with a bit.
Come on.
What do you make of that?
Ow! That's a very powerful beak.
In fact, it may well
have been adapted
for crushing shells and crustaceans
for the sake of the calcium.
'And there's a female.'
Maybe she is another reason why
they had such large beaks -
to show off with
during courtship.
And here comes a rival male.
He could be another reason
for having a huge beak -
to fight with in disputes
over nest sites.
Until now,
no-one has ever seen a dodo egg,
so no-one knows how big it was.
But after tonight, who knows?
Science has revealed the truth
behind many a myth
and discovered some creatures
that are so odd
as to be scarcely believable.
But there is one story
that is still remarkably persistent.
Back in 1951,
a famous Himalayan explorer

and mountaineer, Eric Shipton,
came across some footprints
across a high snowfield
that looked as if they'd been made
by some kind of giant ape.
Shipton's Sherpa companions had
no doubt about what had made them.
A yeti - an abominable snowman.
Well, there is one small,
insignificant-looking specimen
in the storage vaults down here
that could, perhaps,
explain those prints.
It was found in a shop in Hong Kong
that sold Chinese
traditional medicines.
It was the molar tooth
of some kind of ape-like creature,
except that it was huge.
The museum has only got a fragment,
this is it.
But here's a cast of a complete one
and it's six times
the size of one of ours.
It was given the name
Gigantopithecus -
"giant ape."
After that discovery, one or two
more teeth were discovered,
but nothing much, until eventually,
a piece of the lower jaw was found.
The original is now in America,
this is a cast,
but here is the lower jaw.
If this animal had a skull
the same proportions
as those of a gorilla,
its complete skull
would've been this big.
This was a true monster.
So we know a huge ape did exist,
Gigantopithecus.
It could well have stood 3m tall,
in which case,

it would've been eight times
as heavy as I am.
And if you're as heavy as that,
you don't spend much time
climbing in trees
because they won't support you.
So the likelihood is that his arms
are quite short
and he walked upright.
He was bipedal.
I'll get out of the way.
An upright animal has its head
on the top of its spine, as I do.
And if that head
is to be well-balanced,
it's better not to have
a long muzzle,
but a rather flat face.
So if I were to observe
Gigantopithecus
and it stared back at me,
I suspect I'd find its look
rather unnervingly familiar.
Gigantopithecus is commonly
thought to have died out
several hundred thousand years ago.
But sightings of the yeti
continue to be reported,
so is it possible
that some kind of giant ape,
maybe even Gigantopithecus itself,
still survives somewhere out in
those remote Himalayan mountains?
The Gigantopithecus tooth
isn't the only intriguing specimen
down here in the storerooms.
This - a piece of dung.
Looking at it, you might think
it had dropped to the ground
only yesterday.
'It was found in a cave
in Patagonia.'
And with it, a piece of skin,
like this -

covered in a very coarse,
bristly hair
and on the underside,
mysterious white bone nodules,
as though it was a kind of armour.
No known creature alive today
has armoured hide like this.
If it still survived, it would be
a truly extraordinary discovery,
so at the end of the 19th century,
explorers and scientists
started a search for it.
In fact, the dung and the fur
appeared to be recent
only because they had been,
in effect, freeze-dried
in that ancient cave.
The creatures themselves
had died out some 10,000 years ago.
But explorers did find
their skeletons.
They were giant sloths
that lived not in trees,
as modern ones do,
but on the ground.
And this one had immense claws.
What could it have used them for?
These giant sloths probably spent
most of their time on all fours
but nonetheless,
they were perfectly capable
of rearing up on their hind legs.
And when they did that,
they probably stood about 3m tall,
which was as tall as a grizzly bear,
if not taller.
But I don't think this one
is going to use its claws on me.
That dung made it clear that
these creatures are vegetarians,
so they doubtless used those claws
for ripping up plants.
But it's been discovered recently
that they used them

for something else as well.
Something that seems
rather surprising
for animals of their great bulk.
They dug burrows.
Huge excavations like this
have been found all over Patagonia
and we know they were made
by giant sloths
because scratches on the walls
of the burrows
exactly match their claws.
Such immense burrows must have been
excellent places to take refuge.
And the giant sloths
may well have had need of them
because there was a truly ferocious
predator living alongside them.
A great cat
with immense sabre-shaped teeth.
Smilodon.
For me, there is no more alarming
animal in the whole museum than this.
And its skeleton
is perfectly preserved,
because about 10,000 years ago,
it wandered into a pool
of naturally occurring tar,
oozing from the ground
in California.
In general shape,
it was somewhat like a lion,
but more muscular and much heavier
and those sabre teeth
were really sharp.
No wonder the giant sloths
needed burrows
in which to take refuge.
You might think that Smilodon
would have caught its prey
as a lion often does,
by chasing it,
leaping on it at speed
and then throttling it,

suffocating it
with a bite to the neck.
But Smilodon stalked its prey,
creeping quietly across the plains
until it got really close.
And then, it pounced!
Smilodon couldn't throttle its prey
with those huge teeth
and they were too brittle to slash.
They would shatter
if they struck bone.
Instead, the animal would have first
used its great weight
to pin down its victim.
Then it would have used its sabres
like blades
to slice open the soft flesh
of its victim's throat.
But these terrifying hunters
had a rather touching side
to their characters.
Tigers today are solitary hunters
and when one gets too old
to hunt successfully, it dies.
But skeletons of really elderly
sabre-tooths have been discovered,
which suggests that not only
did Smilodon hunt in packs,
but when members of the family
were too old to hunt for themselves,
they were allowed to take
a share of the kill.
The museum is full of creatures
that appear terrifying,
but which no doubt
if you knew them better,
would prove to have quite
a charming side to their characters.
But there is one here that would,
I think, chill everyone's blood.
This is a vertebra from the backbone
of a modern snake.
It was a python
and we know exactly how long it was

because it was measured
when it was alive.
It was 21 feet long, 7 meters.
This, however, is a similar bone
from the spine of a fossil snake
and if this was 20 feet long,
how big was this?
Certainly 30 feet, 10 meter, 11 meter.
It was a monster.
But what did it live on
in those far distant times?
Maybe if I follow it,
I'll find out what it ate.
Science calls this snake Gigantophis
and it was truly immense.
Certainly big enough to swallow me.
But would it have eaten
human beings?
It might well have done if we had
both been around at the same time,
but it lived 40 million years ago
and had become extinct long before
human beings appeared on Earth.
So maybe it preyed on dinosaurs.
Well, no.
Dinosaurs are even older
than Gigantophis
and disappeared some
25 million years before it evolved.
In that case, what about mammals,
such as sheep or deer?
No - at least not modern mammals
like these.
The early mammals
were rather different
from the kinds we know today.
This is a model of
a prehistoric elephant
that was unlucky enough
to wander about the planet
at exactly the same time
as Gigantophis,
about 40 million years ago.
But how could Gigantophis

tackle one of these?

Well, he didn't use venom
to kill its prey.

We know from its massive size
that it must have been
a constrictor.

Constrictors, having seized
an animal with their jaws,
wrap their coils around their prey
and squeeze so hard
they stop their victim's heart
and it dies within a few minutes.

I wonder if he realises
that his dinner tonight
is a fibreglass model.

I'll leave him to it.

There are specimens of animals here
from every corner of the Earth.

But it was much closer to home,
on the south coast in Dorset,
that a group of amateur
Victorian fossil hunters
discovered these amazing
fossilised creatures.

But what kind of animals were they?

They clearly lived in the sea
because seashells are found
alongside them in the rocks.

They had bony paddles -
not fins, like fish -
and huge eyes,

protected by a ring of plates.

Those Victorian pioneer scientists,
led by Professor Richard Owen,
worked out that they were too old
to be mammals

and were certainly not fish.

They were reptiles.

Owen and his friends called them
ichthyosaurs - "fish lizards."

Now it's got skin and flesh on it,
you can see how remarkably similar
it is to today's dolphin.

It's got the same streamlined

silhouettes, same pointed jaws,
it's air breathing,
even gives birth to live young.
But surely an ancient ichthyosaur
couldn't be as advanced
as a modern-day dolphin?
Or could it?
Dolphins are mammals.
Ichthyosaurs, reptiles.
Very, very different groups.
They're not at all closely related
and yet, they both have
very similar body shapes.
They're a remarkable example of
what's called convergent evolution -
two groups of unrelated animals
that have evolved similar bodies
to suit the same environment.
But there ARE some differences.
Dolphins beat their tails
up and down
like their cousins, the whales.
Ichthyosaurs,
as is clear from their fossils,
had tails like fish
that beat from side to side
and dolphins only have two flippers,
whereas ichthyosaurs had four.
So is it possible that ichthyosaurs
were as fast in the water
and as agile as dolphins,
if not more so?
I wonder who would win
in a competition.
One kind of dolphin - spinners -
can leap from the surface
of the water
and spin in the air.
Maybe the ichthyosaurs
could do the same.
We know that ichthyosaurs lived
and evolved on this planet
for many millions of years more
than dolphins have done so far,

so maybe ichthyosaurs would have won
the competition after all.

Who knows?

While the ichthyosaurs
and other marine reptiles
ruled the seas

150 million years ago,
another group of reptiles
dominated the land.

They lived long before big mammals,
let alone human beings.

There are hundreds, probably
thousands of different kinds,
and they came in all shapes
and sizes.

They are perhaps the most famous
and dramatic of all
prehistoric creatures.

And they were first identified
and named here in Britain.

They were the dinosaurs.

Thousands of people come here
every day

to look at their amazing skeletons
and to imagine what they must have
looked like

and sounded like

when they were alive.

It's hard to imagine a time
when the world didn't know
about dinosaurs,

but until relatively recently,
nobody knew they had ever existed,
let alone that they once
ruled the world.

The story of their discovery
starts in the 1820s

when a doctor named Gideon Mantell
living on the south coast of England
in Sussex

picked up something odd
in a sandstone quarry.

And this is what he found.

It's clearly a tooth of some kind.

This is its outer surface
and in shape,
it's very like the tooth of
a living lizard, such as an iguana,
which is why the animal
it belonged to
came to be called Iguanodon -
iguana tooth.
And with it were a number
of other bones.
They were the hips and back legs
of some kind of giant reptile.
More of them were discovered
and soon, there were enough
to get some idea
of what the whole animal
had looked like.
One odd little bone seemed
to have nowhere to go,
so the reconstructors put it
on the end of its nose,
making the animal look like
some kind of reptilian rhinoceros.
It was like nothing anyone
had ever seen before.
So a great fossil hunt started
in the quarries of Sussex.
And eventually, the bones of several
different kinds
of big animals were discovered.
They were brought here
to the museum.
Professor Owen examined them
and he decided that
they should belong
to a completely new kind of animal,
an animal he called a dinosaur -
"terrible lizard."
In due course,
more complete skeletons
of Iguanodons were discovered
and it became possible
to reconstruct them
with greater certainty.

Iguanodon could stand upright.
It had small arms and was over 25 feet
7meters tall.
And that horn on its nose
was actually a spike on its thumb.
Before long,
new and even bigger species
were being unearthed
all over the world,
from the instantly recognisable
three-horned Triceratops
to the sensational
Tyrannosaurus rex.
These astounding beasts
have inspired and captivated
not only scientists,
but writers, artists and filmmakers
for almost two centuries.
But it was Professor Owen,
here in the Natural History Museum,
who first identified them.
And his work has been continued here
ever since.
This is the laboratory
where the museum prepares
its fossils
for study and for display.
It's here that they painstakingly
remove the excess rock
to reveal the fossils
in all their extraordinary detail.
This is the fossilised egg
of a dinosaur,
one of the first to be discovered,
and it was found close to some bones
of a sauropod dinosaur.
Sauropods - this is a model of one -
were gigantic vegetarian dinosaurs
that wandered around on four legs.
There are lots of different species
of them,
they're found all over the world,
and they're the biggest land animals
that have ever existed.

Of course, you can't prove
that it was a sauropod
that laid this egg.
But I would like to think
that it was.
The weight of the sand that
eventually covered it squashed it,
but if we could see it
when it was first laid...
...we would see
that it's much rounder
than a chicken's egg,
more like that of a turtle
or a crocodile,
and of course, very much bigger.
Sounds like something's in there.
But how will that something
make its way out?
Most dinosaur eggs are shell
filled with rock,
but not so long ago,
someone in South America
found a sauropod egg,
and inside,
there was a baby sauropod.
On its nose,
it had a little egg tooth.
Birds and crocodiles
have the same sort of thing.
They need it, as the sauropod did,
in order to be able to break
out of the shell.
Oh.
We know that baby sauropods
were very small
and left their nests very early,
perhaps to avoid being trampled upon
by their huge mothers.
They probably hid in the forest
until they grew large enough
to join the herd of adults.
Hello.
Well, this is just one leg bone
of a fully grown sauropod,

so you can see this little fellow
has got quite a lot of growing to do
over the next few years.
The museum, of course,
has the skeleton of
a fully grown sauropod -
of a kind.
And its story is one
of kings and millionaires.
Back in 1902, King Edward VII,
then Prince of Wales,
saw a picture of
a huge sauropod replica,
one of the biggest yet discovered,
while visiting the Scotsman turned
American millionaire Andrew Carnegie
at his castle in Scotland.
The prince immediately said,
"Well, I would like one of those,"
and in those days,
what princes asked for, they got.
And so, in due course,
another replica turned up right here
in the Natural History Museum.
And there it is.
There are two ways of pronouncing
its scientific name.
It's either "DIP-lo-DOH-cus"
or "dip-LOD-ocus".
Either way,
it's a bit of a mouthful,
so I'm going to use the nickname
that is commonly used around here.
This is Dippy, and what's more,
although there's no way of being
sure whether it was male or female,
I'm going to assume
that Dippy was female.
But what did Dippy look like
when she was alive?
This strangely-shaped fragment
of a dinosaur called Edmontosaurus
was mummified before
it was fossilised,

so not only the bones but the skin
was almost perfectly preserved,
and it was covered in small scales.
They didn't overlap
like those of a lizard,
but formed a close-fitting mosaic.
Maybe Dippy was like that too.
But what about her colour?
My suspicion is that Dippy,
like many large mammals today,
such as elephants or rhinoceros,
was a general all-over
neutral plain colour,
so if we add a little bit
of skin and flesh,
we can get some idea of
what she actually looked like.
So now, after 150 million years,
we've got a pretty good idea
of what Dippy looked like.
But how did she behave?
Well, animals her size and weight
must have moved in
a rather ponderous way.
And in any case,
since she was a vegetarian,
as we know from her teeth,
she had no need to be speedy
to get her food.
But it's the tiny bones
in Dippy's inner ear
that can give us a clue
as to what she sounded like.
These little bones are basically
the same shape
as that of the dinosaur's
closest relatives, birds.
The range of sounds a bird hears
is related to its size.
A small bird makes and hears
high-pitched sounds,
whereas large birds can communicate
with low-pitched sounds.
So huge Dippy, with her inner ear

bone shaped like those of a bird,
could probably hear very low-pitched
frequencies of sound.

And she could probably make them,
too.

We know that elephants today
can communicate using infrasound -
sound with frequencies so low
they're below human hearing
and those sounds travel
through the ground,
sometimes for many miles,
and are detected by elephants
through their large, flat,
sensitive feet.

Dippy, too, had large, flat, feet.

So maybe the giant dinosaurs
communicated with one another
in much the same way,
as well as by bellowing.

And those may not have been
the only noises
that Dippy could make.

Some scientists think that because
of the length of her tail,
and the way the joints work,
she must have been able to crack it
like a whip.

The muscular strength
that enabled her to hold her tail
above the ground
meant that she could, if necessary,
use it as a weapon.

Her tail would have helped
to balance her long, heavy neck,
but why was that so long?

It used to be thought
that she lived in rivers
and needed her neck to break the
surface in order to breathe
But that can't have been true,
because if her body was submerged,
the pressure of the water
would have crushed her lungs.

The most likely explanation
seems to be
that her huge neck helped her
reach vast quantities of leaves.
Sweeping it from side to side,
she could cover
a larger grazing area.
She could also push her head
between forest trees
to reach ferns
and other ground vegetation.
In order to reach the highest,
most succulent leaves in the forest,
it seems likely that Dippy would
have reared up on her hind legs.
Come on, Dippy.
Breakfast. Come on.
Oh, hello.
London's Natural History Museum
is full of wonders.
It's a place where we can get
a vivid idea
of the great variety of life
that inhabits our planet,
both today and in the past,
especially after a night like that.