

1108 TEASE

ALAN ALDA

Chimpanzees are very much like us. In fact scientists say they're 98% the same. On this edition of Scientific American Frontiers, we're exploring how chimpanzees see the world.

ALAN ALDA (NARRATION)

We'll meet the legendary Jane Goodall, the first to really understand chimps.

JANE GOODALL

Woo... woo

ALAN ALDA (NARRATION)

We'll report on the terrible bushmeat trade, the greatest threat to chimpanzees.

We'll see how different chimp groups have their own traditions, just like people.

And we'll take a look inside chimp minds, to find out how they think.

ALAN ALDA

I'm Alan Alda. Join me and our closest cousins on Chimps R Us.

CHIMPS OBSERVED

ALAN ALDA (NARRATION)

If you don't think this looks like chimp habitat, you'd be right. We're in Tucson, Arizona, at a reception celebrating the world's longest running wildlife study.

Forty years ago, Jane Goodall began a revolution in our view of chimpanzees.

MAN

Before her work, people didn't consider that chimpanzees might have, first of all, a mind, that they might be emotional animals, that they might have intelligence. And she has revealed to the world just how complex chimpanzee society is.

WOMAN

I think that it's very very important for Jane to take what she has come to know in her bones and her blood by spending her lifetime with chimpanzees and helping the rest of the world to recognize that.

WOMAN #2

They are disappearing at an alarming rate and it would be very very sad for our children and grandchildren not to have the opportunity to know that these creatures are out there in the world.

WOMAN #3

When you look at a chimpanzee, you don't just see an animal, you actually see an individual. Have you looked into the eyes of a chimpanzee?

JANICE

Tonight, I'm delighted and privileged to introduce to you this woman who has so profoundly changed the world. Ladies and gentlemen, Dr. Jane Goodall.

ALAN ALDA (NARRATION)

Later, at a public lecture, Jane Goodall introduced herself in a language she learned long ago and far away.

JANE GOODALL

...and good evening ladies and gentlemen. I want to start off with a chimpanzee greeting, the distance call, just to say hello in a language that I love. Oop... oop...

So if we can have the lights off, including the one on me, please. Right, thanks.

ALAN ALDA (NARRATION)

Jane Goodall started observing chimps in the wild in 1960, when she was 26.

She had no experience, and no formal qualifications. But with persistence, good luck, a lot of patience, and above all an open mind, she was able to enter the hitherto secret world of our closest cousins.

In 1986, alarmed at the drastic decline in chimpanzee numbers, she decided she had to give something back to her primate friends, and turn her attention to conservation.

Now she spends almost all her time on the road, lecturing and speaking out on behalf of chimps. Tucson was where I caught up with her.

ALAN ALDA

I asked my 8-year-old granddaughter what she'd like to ask you, and she said, "Can she speak their language?"

JANE GOODALL

Oh... oh.

ALAN ALDA

Ha! Great!

JANE GOODALL

You know what that means?

ALAN ALDA

No. I hope it means something we can do on television.

JANE GOODALL

Guess. Oh... oh.

ALAN ALDA

What's that?

JANE GOODALL

If I have a big pile of fruit and you come up to me and I go "oh, oh"... go away!

ALAN ALDA

Oh, go away.

JANE GOODALL

Yes.

ALAN ALDA

Oh, oh. Say it again.

JANE GOODALL

Coh coh.

ALAN ALDA

Oh, oh.

JANE GOODALL

Yes, and...

ALAN ALDA

And they make that gesture like this?

JANE GOODALL

Just like that.

ALAN ALDA

Like that. It's a "go away" gesture, isn't it?

JANE GOODALL

Okay. Now supposing you have a big pile of fruit and you're guzzling it, and I'm younger than you are and less, and I'm subordinate to you, and I come up to you and I go "ooh ooh ooh ooh..."

ALAN ALDA

Pretty clear.

JANE GOODALL

Pretty clear, isn't it? In fact, the postures and gestures: embracing, kissing, patting on the back, swaggering, tickling -- these things we see in human cultures around the world. In chimps they appear in the same context, and they clearly mean the same kind of thing.

ALAN ALDA (NARRATION)

It was domestic hens that were to provide the first indication of Jane Goodall's tremendous talent for observing animals. At age 4, growing up in England, she just couldn't figure out how chickens laid eggs.

JANE GOODALL

There's the egg. So where was the hole big enough for the egg to come out? Apparently I was asking everyone, because I looked and I looked and I couldn't see a hole that big. You won't, either.

ALAN ALDA (NARRATION)

It was obvious to Jane what she had to do – witness an egg being laid, which in this case took place in small hen houses. So the next step was to climb inside a hen house.

JANE GOODALL

What's amazing, looking back, is seeing this little scientist in the making. The question I was asking, I didn't get the answer. Find out for myself. Climb up after her, she flies out frightened -- well then the other hens will be frightened of this place. Well I knew that. And so I climbed into an empty one, and waited. And I waited, apparently, at least four hours, if not more. My family called the police because they didn't know where I was. And dusk was just falling and I was rushing back towards the house all covered in straw, and my mother saw me. But instead of being mad at me and reprimanding me, which would have killed the excitement, she saw my shining eyes and she sat down to hear this wonderful story. When I was around ten, towards the end of World War II, I found Tarzan of the Apes, the books, and I fell passionately in love. Tarzan, Lord of the Jungle. I was incredibly jealous of that wimpy Jane of his. And I thought I would've been a much better mate for Tarzan -- which I would have been.

ALAN ALDA

Yes.

JANE GOODALL

Yeah.

ALAN ALDA

Think of what he could have accomplished.

JANE GOODALL

Exactly. And, so, that was when I dreamed that when I would grow up I would go to Africa, I would live with animals, and I would write books about them.

ALAN ALDA (NARRATION)

Jane saved up enough to visit a friend in East Africa, where she got a job assisting in Louis Leakey's fossil-hunting excavations at Olduvai Gorge, in Tanzania. The famous paleontologist was impressed by Jane's knowledge of animals. So to gain insight into human evolution, he suggested Jane study chimpanzee behavior.

Leakey knew just the place, the remote Gombe Stream Reserve, on the eastern edge of the chimpanzee's home range -- the belt of

equatorial rainforest which is now fragmented, but once stretched across Africa.

After much fussing by the British colonial authorities about the idea of sending a young lady out alone into the bush, Jane started work – chaperoned by her ever-supportive mother.

The only problem was the chimps. They were there all right, but they had no interest in being studied.

JANE GOODALL

I couldn't get near them until one, never to be forgotten day, I was walking through long wet grass after a very frustrating morning. And through the vegetation I saw this dark shape squatting on this golden-colored termite mound. I was peering and peering and I saw -- he had his back to me -- he was picking pieces of grass and clearly poking them at the termite... but I couldn't quite see and I didn't dare move, and he's obviously picking something off. And I saw him reach out and pick a twig and strip the leaves. And that was so exciting because we used to think we were the only creatures on the planet who used and made tools.

ALAN ALDA (NARRATION)

We now know that chimps use tools all the time, but it's hard to overstate the impact of that first observation. It meant that chimps and humans must have inherited tool use from our common ancestor, before our evolution divided 6 million years ago. Suddenly, we and our cousins seemed much closer.

Then just one month later came another breakthrough. Jane saw chimps eating meat, and soon after observed them hunting monkeys. Again it's been seen many times since, but here for the second time was this young unknown turning the academic world upside down – something she would continue to do with regularity.

ALAN ALDA

I get the impression you saw things as they really were, instead of through the prism of the stereotypes that were prevalent at the time. Everybody said they didn't make tools but you saw them. Over decades you saw things as they really were. Why? What was the difference between what you did and what other people have done?

JANE GOODALL

Well, I think Louis Leakey deliberately picked someone who had not been to university, because he felt he wanted an unbiased mind. And so, you know, when he did get me into Cambridge to do a Ph.D. after a whole

year in the field, I found when I got there, that I shouldn't have named the chimps, I should've given them numbers. I shouldn't be describing their personalities because only humans have those. And when I started talking about the mind and rational thought in chimps, that was an absolutely shocking thing to do, that was only humans who had rational minds. And then finally, the worst anthropomorphic sin of all, to give them, ascribe to them human-like emotions like happiness, sadness, feeling despair.

ALAN ALDA (NARRATION)

Because she followed individual chimp families, generation after generation, Jane made important discoveries about motherhood. Mothers who are protective, tolerant and supportive raise relaxed successful kids, who'll pass on those qualities to their kids.

Mothers who are harsh and intolerant raise less successful kids.

Child psychologists soon realized this insight applies to humans, too – another way in which we resemble our primate ancestors.

JANE GOODALL

Children are so often not being treated in the way that the primate has been conditioned to be treated through these thousands of years of evolution. And is the early lack of good experience in so many children whose parents are dysfunctional, who go to bad daycare, is that contributing to some of the violence and dysfunctional behavior that we see in adolescents today? I believe so, and more and more people do believe so.

ALAN ALDA (NARRATION)

In 1974, war broke out at Gombe. It was another big discovery. A few chimps who had split off from the main group were systematically annihilated, over a 4-year period. The main group would send out patrols to locate and hunt down the renegades, and kidnap any young females.

ALAN ALDA

So do you think that was the motivation for the warfare, to recruit adolescent females? Or was it to get territory? Or was it just pure hatred? Hatred of the strange?

JANE GOODALL

The patrols that are regularly made around the territory I think are partly to recruit adolescents, partly if they can to enlarge their territory for their own females and young at the expense of a weaker neighbor. But the attacks seemed to be motivated by some kind of xenophobia, a sort of hatred of strangers. But when I first published these intercommunity

attacks a lot of scientists criticized me. The argument was that if this was published then people would seize on that as evidence that we humans are innately aggressive, and therefore war is inevitable.

ALAN ALDA

And therefore, we should avoid knowing the truth because it might be politically inconvenient.

JANE GOODALL

Right. That's exactly how it was. And you see, I think the point here is that I do believe we have inherited aggressive tendencies from our very ancient primate past, just as the chimps have. But so too, have we inherited tendencies for love, compassion and altruism. And with our sophisticated minds we are capable of pushing which of these two inherited traits we want to follow.

ALAN ALDA (NARRATION)

There's now a permanent study center at Gombe. Jane gets back there maybe a couple of times a year.

Gombe, now a national park, is only 30 square miles -- sheltering just 150 chimps -- entirely surrounded by new farm land.

Right across equatorial Africa, where perhaps a million chimps lived a hundred years ago, development is racing ahead.

Following in its wake has come a terrible new trade in wild animals, for human consumption.

The bushmeat trade, vast and unprecedented, is cleaning out the forests, chimps included. They're now down to about 150,000.

The world's wildlife scientists, including Jane Goodall, are saying something has to be done about bushmeat. We'll have a story on the problem later in the program.

But first we're going to look at the latest, exciting discoveries primatologists have made about chimps. It seems they have their own traditions, like people. Don't go away.

CHIMP NATIONS

ALAN ALDA (NARRATION)

In the rainforests of Africa, one thing happens pretty frequently – it rains.

And when the rain starts, adult male chimps go a little crazy, charging around, pulling at vegetation and hooting. When Jane Goodall first saw this at Gombe, she called it the Rain Dance.

We don't know why they do this, but we do know that it happens at all 6 sites where chimps have now been intensively studied – except one. Chimps do not do the Rain Dance at Bossou, in Guinea in West Africa. In fact, chimp researchers have found 39 different behavior patterns that exist in some places, but not others.

Take hand-clasp grooming, for example, in which two chimps clasp hands above their heads while grooming. This happens at only three of the six sites – here at Kibale Forest, Uganda, but not 300 miles south at Gombe in Tanzania, where there's still grooming -- but with arms held firmly down.

Then less than a hundred miles further south, at Mahale, Tanzania, up go the arms again.

In the Tai Forest and at Bossou, chimps are especially skilled at using hammers, like rocks or logs, to crack several kinds of nuts.

But at two other sites, where there are plenty of nuts, hammers are not used – which seems a shame, since the nuts are clearly delicious.

One behavior that's unique to the Tai Forest is this – using sticks to fish the marrow out of the bones of monkeys that have been hunted, even though chimps hunt monkeys everywhere.

JANE GOODALL

There are different tool using behaviors, everywhere where chimps have been observed. And, you know, I like to think of these as primitive cultures. And what's fascinating here is that obviously at some point one chimpanzee in that population was the first to do something, because they're not born termite fishing and so forth. And then the others, if it's

adaptive, will imitate and so it becomes a part of their behavioral tradition.

ALAN ALDA (NARRATION)

Chimps passing traditions, or cultures, through the generations makes them, once again, a lot like people. It also means that young chimps have to be good at learning, otherwise distinctive traditions like hammering nuts, or special ways to groom, would just die out.

How animals learn is a fascinating and controversial subject, because it can provide a window into their minds.

ALAN ALDA

When they observe another chimp using the tool set, do you believe that they have the idea that if they use that tool in that way they'll get a certain result? Are they thinking ahead in that way or are they just mimicking the use of the tool, and then find out later that it has this payoff?

JANE GOODALL

It depends how old they are. I think the infants, you know, they first begin they show little bits of tool using behavior as they're watching their mothers or their siblings and they discover later. In fact, we saw one infant, she's doing her very first attempts to fish for termites. And you're suppose to have a little stem about that big, at least and she's using something this big, and it happens to be a termite heap that's really very productive. So when she's got her little twig, and she's about two years old, she gets it down and this large soldier termite--you know, they're about that big -- and she looks at it, and she hands it to her mother. And her mother doesn't take the tool, she picks the ant off and eats it. And the little one goes on fishing, and she gets another ant and she looks at it, and she goes like this (chewing noise) and rushes away from the heap and she goes (chewing). It's so funny.

ALAN ALDA

She has the same tastes I do about termites.

ALAN ALDA (NARRATION)

Wild chimps obviously learn by observation, but here at a chimp sanctuary in Florida, they aim to find out how much chimps understand when they learn. You can't figure that out from watching in the wild, because it takes controlled experiments.

TINA

OK Grub, Grubby...

ALAN ALDA (NARRATION)

The six animals here made cute pets or performers as infants. Then they became big, strong, and unwanted. Jane Goodall believes sanctuaries like this are essential, where discarded chimps can live the social and active lives that their minds deserve.

But their presence here provides an opportunity for a psychologist from Florida Atlantic University, David Bjorkland.

DAVID BJORKLAND

These chimpanzees in particular have a different rearing history than wild chimpanzees. One fascinating thing about them is from early on, the ones I'm working with anyway, have had significant human interaction. In many cases treated much like human children.

TINA

OK, Grub, here you go. Here's the tool you're going to use, Grub.

ALAN ALDA (NARRATION)

It's normal for sanctuaries to provide absorbing objects, like bamboo with honey inside. Psychology experiments can be an interesting way for the animals to pass the time as well.

Here's Noelle, a 4-year-old female. Chimps mature at about the same rate as people, so Noelle's a child.

She investigates some strange new objects.

Next, Noelle is shown how to use the hammer and nail.

DAVID BJORKLAND

So we demonstrate the task. And then we wait ten minutes. Ten minutes is long enough to keep the action out of short-term memory.

ALAN ALDA (NARRATION)

When she gets the objects back, right away Noelle shows she's learned what to do. She could be cracking forest nuts by now – but if she was, would she get the concept? Would she understand, just by seeing, that the point is to get to the nut inside?

To answer that, we're going to present 9-year-old Grub with a bigger challenge. As with Noelle, he first gets some objects to explore.

ASSISTANT

Watch what I do. Doesn't that sound pretty? Okay...

ALAN ALDA (NARRATION)

Then a novel use is demonstrated.

ASSISTANT

Do it again. Watch...

ALAN ALDA (NARRATION)

And, of course, as you'd expect the 9-year-old has no problem later showing he learned the lesson.

He's actually rather nonchalant about the whole thing.

But now the real test. Grub's given 4 new objects. First we'll check if he might somehow have had some prior exposure to them.

They're interesting, but there's little doubt he doesn't know what they could be used for.

Next – the demonstration.

ASSISTANT

Watch this...

ALAN ALDA (NARRATION)

Grub is very attentive.

ASSISTANT

Watching? Here we go...

ALAN ALDA (NARRATION)

Grub sees the cymbals being used, but later he's given back only the trowels.

Right away he gets it.

DAVID BJORKLAND

He saw the cymbals and Now he's generalized it to the trowels. Very different shape, different handle. He's really very happy about it, too. We think that that shows he has not just learned a specific behavior, but he's generalized, he's learned a concept, he's generalized the concept.

ALAN ALDA (NARRATION)

Psychologists regard getting the underlying concept like this as a more sophisticated form of learning than simply copying an action. Humans learn this way – our complex societies couldn't exist without it.

But it seems the ability must go back a long way.

DAVID BJORKLAND

This gives us one possible mechanism for cognitive evolution. What chimpanzees, human beings and maybe our common ancestors had in common. So, for me, it tells us something about the chimpanzee mind, but also tells us something about how, quite possibly, we became human.

ALAN ALDA (NARRATION)

We'll never really know if conceptual learning happens in the wild, because it's impossible to know if a young chimp is generalizing a concept, or if it's just doing something it's seen adults do before. David Bjorkland believes it may be only human-raised chimps, like Noelle and Grub, that can conceptualize actions, while wild chimps just copy them.

But either way, different chimp groups do learn their own distinctive traditions, passing them down through the generations – almost like different chimp nations. That doesn't make chimps human, but it does make chimps, chimps.

CHIMPS GETTING ALONG

ALAN ALDA (NARRATION)

Right below Frans De Waal's office at Yerkes Primate Center in Atlanta, there's a group of 19 chimps that are free to interact in their own ways.

Frans believes, like Jane Goodall, that much chimp and human behavior is closely related.

This is Jimoh, the alpha male, and Peony, the dominant female, with her daughter.

The adolescent males in the group often act like adolescents. But the fights rarely get serious. They usually end in friendly reconciliations -- this one involving tickling and laughter.

FRANS DE WAAL

Now we will throw them in one at a time.

ALAN ALDA

OK.

ALAN ALDA (NARRATION)

When I visited Frans 5 years ago, some new experiments were convincing him that even human ideas like morality might have parallels in chimp behavior.

FRANS DE WAAL

It's to see who shares with whom.

ALAN ALDA (NARRATION)

These bundles of leaves are a treat for the chimps, an addition to their regular diet.

FRANS DE WAAL

That's a juvenile who took it and the alpha male takes it over from him, see, and then here...

ALAN ALDA (NARRATION)

Most of the chimps gather around one of the bundles, and peacefully share the leaves.

But the bundle right below us was taken by a young female called Georgia, who is much less willing to share.

ALAN ALDA

You think Georgia is stingy because she hasn't learned to share yet or is she just naturally stingy?

FRANS DE WAAL

Well, in human terms you would almost say that she doesn't have the confidence yet and the position yet to be generous with others. She's still very much in a sort of competitive mode like, "How much can I get myself?"

ALAN ALDA (NARRATION)

Georgia sat with her back to us, firmly monopolizing her bundle.

FRANS DE WAAL

In a year we collect thousands of food transfers between individuals. We see that among adults, it's reciprocal -- if I share a lot with you, you will share a lot with me. Juveniles are totally out of this. Juveniles work on a stealing operation.

ALAN ALDA (NARRATION)

Georgia's tactic of stealing backfires as another juvenile steals the whole bundle from her.

FRANS DE WAAL

That's a typical juvenile way of doing it.

ALAN ALDA (NARRATION)

Georgia's selfishness has other consequences, too.

FRANS DE WAAL

Individuals such as Georgia, who are not very generous, when they are in need of food, they're the first ones to be rejected by other individuals. And so it is as if the other individuals are saying "Well, you're never sharing with me, why should I share with you?" And this is also how young females such as Georgia are gradually learning, it is much better to cooperate with a system like that -- we get actually more out of it by cooperating and contributing to it.

ALAN ALDA (NARRATION)

Frans and his research assistant Mike Seres have kept track, in the thousands of trials they have run, of just who shares with whom. What's remarkable is that the chimps keep track too. So if one chimp shares food with another in the morning... the generosity is returned by a spell of grooming in the afternoon.

The very young are allowed to get away with behavior that the females in this group don't tolerate from an adolescent male.

He picks up a stick and tries intimidation, but the group isn't impressed.

Here's Georgia, again causing trouble. Jimoh ambles over, nudges her gently, and she holds out her hand in apology.

Again, Jimoh breaks up a squabble.

So while as in human society there's conflict and aggression, chimps have many strategies for keeping the peace. Frans sees in these behaviors the root of what in humans we call morality.

FRANS DE WAAL

They have many of the emotions and elements of human morality such as empathy and sympathy probably. Generosity. Certain forms of altruism. Rules and regulations. Conflict resolution, which is one of my main interests, is how to resolve conflicts among themselves. And basically you can look at human morality as a system that resolves conflicts among parties that live in one society.

ALAN ALDA

Does that lead you to think in a different way about the origins of human morality than you did before?

FRANS DE WAAL

Human morality must have some deep evolutionary roots. It must come from somewhere. And probably in other animals we can find not the whole system, but we can find certain elements of human morality. And that is what I am seeing when I look at chimpanzees,

CHIMP MINDS

ALAN ALDA (NARRATION)

We're back at the Florida chimp sanctuary where we tested learning abilities, this time to see whether chimps have a grasp of how the world should work. Do they, like people, have some general scheme in their minds against which they can measure events?

A basic element in such a scheme would have to be the ability to distinguish live from not-live.

DAVID BJORKLAND

Will the chimps understand the difference between animate and inanimate objects, which of course at one level they do, but more importantly, will they think it peculiar when they see something like a mallard duck, for example or a little blackbird being used as a screwdriver? Which, blackbirds are not typically used as screwdrivers. Or when they see someone take a rock and treat it like a pet, very kindly and speak to it?

ALAN ALDA (NARRATION)

First, we're going to work with Noelle, the 4-year-old female. She loves all the attention.

ASSISTANT

So, Tina, you treat the hawk as if it's a piece of sandpaper and Jen, you treat the hammer as if it's a hammer.

ALAN ALDA (NARRATION)

Here we're comparing inanimate objects treated as inanimate...

...to something that should be alive, but treated as if it isn't.

Already you can see Noelle's intrigued by that one.

DAVID BJORKLAND

Time.

ALAN ALDA (NARRATION)

A strict protocol is followed, designed to eliminate any factors which might bias the chimp's impressions.

DAVID BJORKLAND
Time. Together.

ALAN ALDA (NARRATION)

Finally Noelle gets to point out which one she'd like to investigate further – and yes, it's the strange one, hawk-sandpaper.

Next Noelle is shown a rock, treated as a pet...

...versus rock as rock.

DAVID BJORKLAND
Time.

ALAN ALDA (NARRATION)

And the pet rock's the interesting one.

DAVID BJORKLAND

We're going to do the blackbird. Jen, you go first. You're going to treat it animately. Tina, you go second, and it will be as a screwdriver, inanimately. Okay. Anytime you're ready. Go ahead.

ALAN ALDA (NARRATION)

So far, Noelle's choices could be explained if she just likes anything animate – either the object itself, or its treatment.

But now for the first time she's facing some "animate-ness" on both sides -- blackbird-pet, versus blackbird-screwdriver.

DAVID BJORKLAND
Time.

ALAN ALDA (NARRATION)

But she still gets it -- blackbird-screwdriver was the weird one. So far it's a solid worldview.

DAVID BJORKLAND
Okay, Tina you go first. Go ahead.

ALAN ALDA (NARRATION)

Now comes the toughest challenge.

Inanimate log, treated like animate pet, up against a powerful combination – animate duck, treated like an animate object. That’s a kind of double dose of animate-ness.

ASSISTANT

What were you doing in that bucket, you silly mallard?

ALAN ALDA (NARRATION)

And it’s too attractive for the young chimp. The pet log should have violated her expectations, as psychologists say, but she missed it, and that’s normal for Noelle.

DAVID BJORKLAND

Generally when there’s a choice for Noelle between an animate object and an inanimate object, she’ll go with the animate object no matter how it’s being treated. But you did see earlier when there were the blackbirds - one being treated like a screwdriver, and one being treated like a pet, she went with the one being treated like a screwdriver. So there’s a little bit of going-for-the-violation-of-the-expectation, Noelle. But when push comes to shove, is she has a choice between an animate object, no matter how it’s treated she tends to go towards that.

ALAN ALDA (NARRATION)

Human 3-year-olds also fail this test. But now let’s see how 9-year-old Grub does, with the identical series of tests.

First hawk-sandpaper...

...against hammer.

DAVID BJORKLAND

Time.

ASSISTANT

OK, go look.

ALAN ALDA (NARRATION)

No problem – but as with Noelle, this was the only animate element in this trial, so it wasn’t much of a test.

Next, pet-rock against rock-rock.

DAVID BJORKLAND

Time.

ALAN ALDA (NARRATION)

Again, no problem, but again this was the only choice with any animate element to it, in the way it was treated.

Now, animate blackbird treated animately, against screwdriver-blackbird. It's a tougher choice, but like Noelle he still picks out the one that's peculiar.

ASSISTANT

Go look.

ALAN ALDA (NARRATION)

Finally the big test. The doubly-attractive mallard treated animately, against the log treated animatedly. This is the one Noelle failed.

ASSISTANT

Look at you. How pretty you are.

ASSISTANT

What a beautiful log you are.

ALAN ALDA (NARRATION)

No problem. Grub is casually confident in his choice. At age 9 he has as solid a concept in his mind of how things should be, as the same age human.

So chimps can think conceptually, they can learn conceptually, and they can even handle abstract concepts, as we'll see next.

SALLY BOYSEN

Hi sweetie.

ALAN ALDA (NARRATION)

This is Sally Boysen, a researcher who, like the Florida researchers, also works with rescued and orphaned chimps. A couple of years ago she showed me how chimps get abstract concepts with ease.

We're going to run a "hide and seek" experiment, using a scale model room and a matching real room that's just a few feet away. Sally says that chimps can get the connection between the two -- that one can be a symbol for the other.

SALLY BOYSEN

Here's our little miniature room. And we have a replica of that cupboard. And a little chair right here. Blue tub. We have a miniature tree here.

ALAN ALDA

And this little can here?

SALLY BOYSEN

That's the item we're going to hide.

ALAN ALDA

Oh, I see.

SALLY BOYSEN

They'll watch as we hide this, like under the blue tub.

ALAN ALDA

Yeah.

SALLY BOYSEN

Then I go in the real room and hide a real can of soda. And then the chimp has to pay attention to where we hid it here, and then find it in the same place inside.

ALAN ALDA

What's the real room look like compared to this?

SALLY BOYSEN

Bigger.

ALAN ALDA

Yes.

ALAN ALDA (NARRATION)

Everything in the model has its full scale counterpart

ALAN ALDA

That doesn't open?

SALLY BOYSEN

Yeah. It does. The chimps know how to open it.

ALAN ALDA

You have to be a chimp... yeah right.

SALLY BOYSEN

You just go like this. It's kind of an IQ test. What can I say?

ALAN ALDA
Oh, I see, yeah.

SALLY BOYSEN
Whoops.

ALAN ALDA (NARRATION)

We're going to be working with strong, full grown animals.

SALLY BOYSEN
You stay out here.

ALAN ALDA
Right. You're going to be in there?

SALLY BOYSEN
Yeah.

ALAN ALDA
Now, you're safe in there?

SALLY BOYSEN
Sure. But don't try this at home.

ALAN ALDA
I haven't got a chimp at home.

SALLY BOYSEN
Miss Sheeba.

SALLY BOYSEN
Very nice, okay, she has to get a little rowdy here. This is so much fun, isn't it?

ALAN ALDA (NARRATION)

Sheeba is 17 years old -- raised from age two by Sally.

SALLY BOYSEN
That was impressive.

ALAN ALDA
That was cute.

SALLY BOYSEN
That was very impressive. Come on. Let's go talk about the scale model study.

ALAN ALDA

You know, I've worked with actors like this before.

ALAN ALDA (NARRATION)

I have to admit, Sheeba's not striking me as much of an intellectual yet.

SALLY BOYSEN

Okay, I've got some real Pepsi for you. All right, where shall we hide it? Let's see. I'm going to take this little one. Are you watching me? And I'm going to put it in here. Okay, watch. I'm going to put it right in here. So we put it in here. Shall I show you again. Look. I put it right in here. Isn't that cool? I know I have makeup on. See my lips? I know I have different makeup on. Now, you see that? We're going to keep on going. Now you stay right here. Okay. I'll be right back. I'm going to hide this real one for you. Okay, stay right there. Stay there. Where is it? Where did we put it? In here, right. There's the little one. Okay, go find the real one for me. Hurry. Hurry. See if you can find it. Good work!

ALAN ALDA

She gets it opened, too.

JUDY DELOACHE

Here's Big Snoopy and this is his little friend, this is Little Snoopy.

ALAN ALDA (NARRATION)

Now look at how a two and a half year old human does in the same experiment.

JUDY DELOACHE

Look I'm hiding Little Snoopy...

ALAN ALDA (NARRATION)

This experiment has been tried with hundreds of children.

JUDY DELOACHE

You wait here while I hide Big Snoopy. I'm going to hide him in the same place in his room.

AMOS

And I'll go find him.

JUDY DELOACHE

Okay, Amos, Big Snoopy is ready. Can you come find him? Remember he's hiding in the same place in his room that Little Snoopy is hiding. Remember Big Snoopy's hiding in the same place...

ALAN ALDA (NARRATION)

Until about age three kids never get that the model symbolizes the real room.

SALLY BOYSEN

Sheeb, that's where I put the little can, see it? OK I'm going to go hide the real one.

ALAN ALDA (NARRATION)

So in one way Sheeba is sharper than the average two and a half year old human.

SALLY BOYSEN

Don't cheat, I'll be right back.

ALAN ALDA (NARRATION)

There's no doubt that Sheeba sees the model as representing the real room. That's abstract thinking the way humans do it. So in this respect, chimps really are us.

SALLY BOYSEN

Where'd I hide it? Can you remind me? Remind me where I put it. Right there! Okay, see if you can get it for me, hurry, go on. Oh, you found it, all right, good work, good work!

CHIMPS UNDER THE GUN

HUNTER

[Hunting call]

ALAN ALDA (NARRATION)

People have hunted here for thousands of years, but in the last decade or so a vast new trade in wild animals -- or bushmeat, as it's known -- has spread through the region.

It's not subsistence hunting by locals. It's a long distance trade that's reaching into big cities, sometimes even to Europe and America.

We're going to look at the bushmeat trade in our final story, and please be aware that we're going to show some quite graphic scenes.

ALAN ALDA

What about the bushmeat problem? That sounds like an enormously serious problem.

JANE GOODALL

That's the worst conservation threat to the great apes in the great Congo basin. The Congo basin has been their stronghold, the place in Africa where there were the only significant populations, 12 years ago.

ALAN ALDA (NARRATION)

One man focused the world's attention on the bushmeat trade -- Karl Amman, a writer and photographer who lives with his wife, Kathy, outside Nairobi in Kenya.

KARL AMMAN

Ah, yes, Carol, this is Karl Amman. Can we just reconfirm...

In 1988 we did this trip on the Congo River. We were in one of these legendary Congo River boats which are essentially big floating villages.

ALAN ALDA (NARRATION)

The trip took Karl and Kathy into the heart of one of the world's last great forest wildernesses, covering a million square miles.

Most of the remaining 150,000 chimps live here. A hundred years ago there were perhaps a million chimps, when forests were much more extensive.

The river boats are big travelling markets, but Karl was surprised by what was being traded.

KARL AMMAN

We saw a hell of a lot of wildlife coming on board -- smoked, fresh, and some still alive.

ALAN ALDA (NARRATION)

There were many monkeys and baby chimps. They took pity on one chimp that was tied up, and bought it. Its family had undoubtedly been shot. Overall it was the sheer numbers of wild animals that struck them.

KARL AMMAN

The feeling was, there's something going on. If we didn't know about it, probably a lot of people didn't know about. And I felt I wanted to further investigate how big an issue this really was.

ALAN ALDA (NARRATION)

Karl embarked on a series of trips across half a dozen central African countries.

It soon became clear that something was going on, and yes, it was a big issue. It starts with foreign development money flooding into the region.

The primary goal is to take out the most valuable trees for export.

And the only way to get in is to build roads – thousands of miles of them, penetrating what was impenetrable.

KARL AMMAN

They're opening up those very very deep corners of the forest where hunters haven't have any access, and which have been pretty undisturbed, you know, forever.

ALAN ALDA (NARRATION)

The bushmeat trade works like this. At the head of each logging road is a camp for workers, housing several hundred people.

Professional hunters fan out into the forest from each camp.

KARL AMMAN

We have now left the main road and are following on this hunting trail to where he said he shot at six o'clock this morning, four gorillas.

ALAN ALDA (NARRATION)

Saying he was simply interested in the animals they were finding, Karl persuaded many hunters to take him along.

Killing any great apes – chimps and gorillas – is illegal everywhere, and hunting of most other wildlife is strictly limited.

But there is essentially no enforcement of wildlife laws, although no hunters were keen on their business being exposed.

KARL AMMAN

I'm a little bit worried because these guys have started talking, which is essentially bad news, because this is sensitive footage by any standards.

ALAN ALDA (NARRATION)

After dozens of trips, tirelessly hiking in and out on logging roads, observing hunters and checking markets, Karl has built up a comprehensive picture of the bushmeat trade.

The first stop for the bushmeat is usually one of the forest hunting camps. At this one in Congo, Karl saw chimps that had just been brought in, along with several orphaned babies.

Babies don't bring much of a price as meat, so the hunters don't shoot them along with the adults. Instead they try to sell them as pets.

Of course, many don't survive.

At the hunting camps, most of the meat is smoked. It may have to travel for a week or more before reaching the eventual consumer.

KARL AMMAN (SUBTITLE)

Is the hand good to eat?

CAMP WORKER (SUBTITLE)

Yes it's good.

ALAN ALDA (NARRATION)

These are chimp parts.

GUIDE (SUBTITLE)

What's that?

CAMP WORKER (SUBTITLE)

The head of the female.

GUIDE (SUBTITLE)

That's the hand.

CAMP WORKER (SUBTITLE)

It's the right hand.

ALAN ALDA (NARRATION)

There are thousands of bushmeat processing camps all over the region.

They supply, first, forest markets like this, where Karl saw some of the endangered Bonobo chimpanzees, a smaller relative of the common chimp.

KARL AMMAN

We're here at this weekly forest market and we have just come across this Bonobo carcass which was just brought in by some traders. And it's a relatively fresh carcass. It's smoked, but it's probably not more than a few days old. And it's going to be sold here for roughly about seven to eight dollars.

KARL AMMAN (SUBTITLE)

How much is that?

TRADER (SUBTITLE)

That's a hundred thousand. And that's fifty thousand.

KARL AMMAN

Okay, this is a hundred thousand. And this is fifty thousand. That's another piece of chimp.

GUIDE

You see the hand.

ALAN ALDA (NARRATION)

Still out in the forest, the logging camps are the first large scale consumers of bushmeat.

Here endangered forest elephant is being consumed, along with gorilla.

KARL AMMAN (SUBTITLE)

Do you prefer elephant or gorilla, as meat?

MAN IN CAMP (SUBTITLE)

Gorilla. Elephant is not as good to eat as gorilla.

ALAN ALDA (NARRATION)

Perhaps three quarters of the bushmeat is trucked out of the forest along the same new roads that brought the hunters and loggers in.

Finally it gets to one of hundreds of towns and cities in the region, where it's estimated there may be 70 million people who consume bushmeat regularly.

Karl filmed bushmeat shipments arriving on truck after truck.

To go into the markets, Karl asked his assistant to wear a camera hidden in a pair of glasses. Even though the laws aren't enforced, almost all of this trade is still illegal.

KARL AMMAN

That looks pretty small, Joseph. Look into my lens, so I can see.

ALAN ALDA (NARRATION)

The urban markets are filled with an enormous variety of bushmeat. Practically every animal in the forest can be found – monkeys, antelope, birds, bats, chimps, gorillas, elephant.

Bushmeat is popular, and brings high prices.

KARL AMMAN

When we're talking urban centers, where the demand comes from, you have a setting where people pay a premium for this meat, and it's not eaten by the poor, but by the middle class and the rich. And that's really the aspect which drives the market.

ALAN ALDA (NARRATION)

Bushmeat is regarded as much more desirable than farm-raised meat, like pork or beef.

For many people it's a nostalgic link to a past village life that's gone forever.

AMMAN'S ASSOCIATE

He bought a piece of fresh chimp hand, which is a desirable piece, for 2,500 CFA. He bought a kilo of fresh beef, without bone, a good deal more meat than this, for 1,500 CFA. Smoked chimp hand he bought for 2,500. Smoked chimp arm he bought for 2,500. It's more meat but it's less desirable meat than the hand. Domestic fresh pork for 1,300.

ALAN ALDA (NARRATION)

Karl realized the trade he had at first stumbled across, and then uncovered, was nothing less than a catastrophe for African wildlife. Because of the staggering scale, it's turned him into a full-time advocate for controls.

KARL AMMAN

There's one estimate which states a million metric tons, a billion kilos of game meat consumed in the Congo River basin annually. I mean, that would be a billion dollar business. There are very few other billion dollar industries in the whole of Africa. When it come to apes it's pretty clear cut that it cannot possibly be sustainable.

ALAN ALDA (NARRATION)

For chimpanzees, with their traditions and complex societies, just the disruption of logging would be serious. But the bushmeat trade is far more threatening.

KARL AMMAN

You might have a huge impact on chimp populations even without hunting, but if you than combine it with hunting, it's clear cut that it's unsustainable. So, you know, I don't think we should wait for the scientific data. I think all the indicators are that it's pretty much unsustainable for pretty much every species. And it's an excuse to say we have to have scientific data to prove it. We should deal with the solutions rather than analyzing the problem.

ALAN ALDA (NARRATION)

Karl now has a second orphan chimp, rescued when it was a baby. He's set up a sanctuary for them near his house. It's only a gesture of course, in the face of this trade which could within 10 years wipe out all chimpanzees living outside small protected areas, like Gombe National Park. Reducing the trade is going to take everything from changing the taste for bushmeat, which Karl wants to attempt, to international pressure.

JANE GOODALL

The whole situation is really, really difficult. And it's going to need, I think, pressure on heads of state in the developed world, on the World Bank. We're going to need to put pressure on the heads of state in these central African countries to help them to enforce their own wildlife laws. And in a country that's torn apart with civil war, like the old Zaire, and like Congo-Brazzaville, how do you do it?

ALAN ALDA (NARRATION)

For Jane Goodall, the bushmeat trade is just one of the ways we mistreat our closest living relatives. We use chimps for medical research, or as pets, we put them in circuses – none of these is acceptable, she says. And for her, that's just the beginning.

ALAN ALDA

What ought we to know about our cousins that would make us behave more humanely, more intelligently toward them?

JANE GOODALL

That their lives do matter. They have a personality. Each one is different. There are all these different life histories. They have minds. They can solve problems. They invent new things. They feel, as we feel, as far as we can tell. And so they are chimpanzee beings, as we are human beings. And you can extrapolate from that down into our dogs and our cats, our horses, the pigs that we shut up and eat. That we have to learn from the chimps. I like to see it as, a chimpanzee reaches towards us, over what we saw as an unbridgeable gulf between us and the rest of the animal kingdom, and the chimp looks into our eyes and says, "Don't you understand that our lives matter, too, that we have personalities, and minds, and feelings?" And if you look back into those eyes, and you reach out and take that hand and say, "Yes, you're right," then they'll turn over their shoulder and say, "And what about them? What about all those other amazing animal beings? Don't they matter too?"