

ROYAL INSTITUTE LECTURES

The Language of Animals - Part IV

Given by: David Attenborough

2nd January 1974

OPENING SEQUENCE

APPLAUSE

David Attenborough: Well so far we have been talking about, for the most part pretty simple languages. We have been talking about simple signals like a spot on a Herring gulls beak, and simple reactions. But of course some animals have much more complicated signals than that, and I'd like to show you to start today a film of one of them which if you are lucky enough to live near a lake, or perhaps a flooded gravel pit, you may see for yourself at this very time - Great Crested Grebes. Now in the spring the great crested grebes go through this marvellous beautiful display, they go through many displays and I am only going to show you a few of them on this film, but I want you to look at them very closely. You see they shake their heads, they lower their beaks, they swim round one another, FX: Now keep careful note of what they do because what we want to do is to try and explain why they do it. FX: More head shaking. Notice they have got tufts on their heads. That one pecked it's wings. This sort of dance goes on for a great part of the year. Now look it's got its beak open, that could be important, and so was that. Both shake their heads. And these dances, these displays go on for long periods of time, I mean one single display may last many minutes. Head bobbing there. FX: They don't always go in the same order but there are several acts, as it were, to this bit of theatre, and the last act which doesn't always happen, but which we are going to see now involves diving. Now watch this one. Dive. And up it comes close to another one and in it's beak a weed, and then the two, you see they are treading water here, in order to get high up out of the water they are treading water, and both.. that one has weed in its beak and this one doing this particular dance, the other one often has weed as well, and the two of them stand up facing one another with weed in their bills. Well now that dance happens every spring, these birds were once nearly extinct in this country, happily there are many more of them now, but it happens every spring and of course we know in the, sort of terms of what it's for. If you say what is it for, it is something to do

with courtship, it is something to do with nesting, it is something to do with mating, we know that because that is the time it happens that it leads up to that. They then nest rear their brood, and then they loose a lot of their lovely tippets on their heads and their crests, they become much plainer in plumage and they don't dance until the next late winter, early spring. But the question is: why should they do that complicated series of gestures and dances and rhythms. Now the reason I picked that particular bird to talk and that particular display, is partly because it is British, partly because it is the most sensational display which I think you can see in any British bird, but also partly because it was the study of one of the greatest living British Zoologist Sir Julian Huxley, who was the first man to look at that display sixty years ago, in 1914. Sixty years ago, and to analyse it and work out that in fact almost every movement in those displays was developed from a perfectly ordinary movement that the birds make as part of their everyday life. Not as signals, just as part of their everyday life. Ordinary movements that have been taken out of the place in their normal part of life, put into a dance and changed, elaborated in some way, in a way which Sir Julian called Ritualisation. And what I am going to try and do, and I shall need your help because it is really quite difficult, what I am going to try and do is take that dance to pieces and try and see which bits are derived from what sort of behaviour. Now, as I said the bits of behaviour that are ritualised aren't necessarily signals at all, they may come from ordinary everyday life, and so in order to see what is the raw material, as it were, for displays of this sort let's do one or two experiments. Now then, you, will you come and sit there? Now I am going to sit opposite you, what is your name?

Johnathan.

David Attenborough: Right Johnathan. Now what I am going to do is to ask you a series of questions, I am going to keep you in conversation. But actually I want you to imagine that just through that door there are free ice creams going, you see, and that unless you get there within the next couple of minutes you will miss the ice cream, you see, so that you actually don't want to know what my questions are, you certainly don't want to answer them, you want to get out there, do you understand? Right. Now did you have a good Christmas Johnathan?

Johnathan:

Yes I did thank you, by the way...

- David Attenborough: John...did you get some nice, did you get some nice presents ?
- Johnathan: Yes I did, I am very sorry...LAUGHTER:
- David Attenborough: What sort of presents did you get ?
- Johnathan: I got some very nice books Sir, yes it's about...
- David Attenborough: .. do you have to go right now.. ?
- Johnathan: Yes I am very sorry, it's...
- David Attenborough: Oh I see. Thank you very much, you go and sit there....APPLAUSE: Very good. I hope you were watching him closely because I want you to tell me some of the things that he was doing.
- Children: He glanced at his watch.
He kept trying to get out.
- David Attenborough: He kept trying to get out, he kept doing that, didn't he ?
- Children: He gave very short answers.
He talked quickly.
He kept pointing towards the door.
Made his answers boring so that you wouldn't...
- David Attenborough: ..I think he would deny that, but you are probably right, yes I think you are right. Any more ?
Well he did this with his hands didn't he. And did you notice what he did with his eyes ? Yes ? He glanced towards the door.
- Children: He tried to keep his eyes off you, and he tried to sort of express he wanted to get out.
- David Attenborough: That is right, absolutely right.
Now let's just sort that out. One of the things he was doing was trying to as it were, break contact with me, so that he wasn't looking me in my eyes, he kept turning away trying to sort of as it were, break away from me, and so he was not being aggressive to me he was if anything being sort of withdrawing away from me in a sort of passive way of trying to get away. That's one thing. And that is important and the other things that he was doing as you said was that he was, he kept lifting himself up off his seat didn't he ? But he didn't actually go partly because I had stopped him, partly because naturally being a splendid chap he didn't want to be too rude about the whole thing, and so sort of politeness to me kept him sitting there and he was making what biologists call intention movements or incomplete

movements. That is to say, he didn't actually go he made a movement that was just half way to going. What else did he do? He kept putting his hands on the table as it were to lift himself up, that too was an intention movement. So what I want you to notice there was that he did two sets of things. He kept turning away from me, to as it were, break contact, without actually going near you, and he also made these intention or incomplete movements as though he was about to go. Right, now animals do just the same things. Let me show you some intention movements in one animal I hope. Now this is a very beautiful starling. The Royal Starling from East Africa. There we are. Now I won't go too near him at the moment because he is a little disturbed, but if you watch him on a perch.. He's looking very upset at the moment. But if he gets onto a perch he may actually show the intention movements of flying. Now intention movements, particularly flying intention movements, are very important if you ever try and make natural history films, because a bird simply sitting on a perch rather motionless is not a very interesting picture and you can turn.. you may sit there for hours, and your film is going on for hours, and hours and hours of film go through and nothing happens and it's costing a lot of money and it is very boring. But if you are a good naturalist you will know that if the bird is going to fly away which could be an interesting shot for you, what it will do .. are you going to do anything .. what it will do is lean forward and put it's bill forward and slightly loosen it's wings .. now watch now, he jerked his tail that's an intention movement of going to fly, you see jerking his tail. Leaning forward looking around now if I back away he may .. see him leaning forward there .. that's an intention movement of flying. If I go still further away. There. Now you may think that is not very important, you may think that is just a perfectly ordinary piece of behaviour from a bird, and so it is, you are quite right intention movements are perfectly normal bits of behaviour and that indeed is the point. Because intention movements are part of our everyday life. Thank you very much if we can take him away I will walk round because I don't want to go too close to him to disturb him, because he did very well for us. Thank you Royal Starling. Right, now so we have got a category of intention movements and of breaking away which we have demonstrated amongst you and amongst the birds. Now there is another whole collection of movements which we make which I actually have been making since I came in, do you notice I have been walking up and down, got nothing much to do with what I was saying, and you may think that it's

something to do with the fact that I might conceivably be nervous. And you may be right. And actually sometimes you may even see me, as it were, do that .. that's got nothing to do with what I am trying to say to you either, that too is nervousness, and even actually lots of speakers will while they are talking suddenly actually decide that they .. want a drink and that too could be a sort of nervous behaviour of course it could also be that I was getting rather dry, and if I was getting rather dry, I don't normally get rather dry, it's only because I'm getting rather dry, because I am rather nervous. So there are a selection of movements which you do which have got nothing to do with the message which you are trying to get across, but which you do out of nervousness or trying to keep yourself in good condition. Ruffling your hair, walking up and down, having a drink. Now those sometimes are called displacement activities in the sense that they are things which don't normally have much to do with the action that is going on, and which are as it were, accidental - have been displaced from where they normally take place, let us say in your toilet, and have been put into another part of the activity. For example if you watch birds fight, I mean the ritual fighting that we have been talking about in other talks, you often see them break off and preen. Now it could be that they are just preening because they like to keep their feathers in good condition, but one way or another those are whole sets of activities which occur when creatures are in a nervous situation. So now we've got two categories. For the third category I'd like another demonstration. You two chaps sitting there, come and sit down there. Face one another. Now - you have got to watch these lads - now I want you to argue with one another about something, now I don't want you to actually smash one another's face in you understand, I don't want you to reach across and pick him up by the shirt front or anything like that, but I want you to argue fairly vehemently, fairly powerfully. Do you have a football team that you think is the best? Oh. Do you have, what subject do you feel strongly about? Pollution. All right, you tell him that pollution is a load of rubbish. Now carry on.

Boy: Well there's a lot of pollution about these days.

Boy: Oh no it's not really as bad as that.

Boy: It is if you go down to the Thames now very far from here you see pollution everywhere... there's no fish there at all

Boy: Oh rubbish it doesn't really matter does it.

Boy: It does, if there's no fish you can't eat fish it is bad for you and you end up eating cattle and get...

Boy: Oh rubbish, come on, come on you can use the Oceans, what's it matter with the Thames.

Boy: Well even they are getting clogged up with... LAUGHTER:
You go down to Brighton beach you see oil..

Boy: Oh whats the matter with beach, you only use them for
swimming, ...

Boy: Yeah but they come out from the middle of the English
Channel, you get fish from the middle of the English Channel.

Boy: The English Channel is not for fishing, you use the
Oceans don't you.

Boy: ..You get fish from everywhere... pollution everywhere.

Boy: Oh rubbish.

Boy: You do... LAUGHTER: ...

David Attenborough: Fine, before blood's shed, thank you
very much. APPLAUSE: I'm on your side. Now I am sure you were
watching, naturally, but you see what did they do ?

Boy: They waved.

Girl: Thumped their fists on the table.

David Attenborough: Very good.

Boy: They moved closer.

They became progressively louder.

Went red in the face.

David Attenborough: Correct. First rate, absolutely
first rate. Anything more ?

Put their hands....

Voice got higher.

Got closer together.

Interrupted each other.

David Attenborough: That's quite enough to be going on with
Let me try and sort out that. They got closer together, and that is
an aggressive movement, and what's more they looked as they got
closer together they looked deeper into one another's eyes, absolutely
the reverse you notice from what Jehothan did to begin with, when
he was turning away, instead of that they looked deep into one another's
eyes, and lastly, out of that particular collection of bits of
behaviour FX: He pounded the table. Now what he was doing was

pounding the table instead of pounding him, the other fellow. Why was that? that was because, partly because naturally he is such a well mannered chap that he wouldn't actually smash the face in of the chap opposite him, and also there are other inhibitions it might have been that he thought he was a bit strong anyway and wouldn't want to take him on. So what he was doing was actually pounding the table instead of pounding him. In other words he was directing an action away from where he really wanted it to go into something else where it wouldn't harm. There's a sort of music-hall story, a joke which you sometimes hear told about how a chap who has a bad time at the office comes home and is very bad tempered with his children, because he's had a row in the office and he has redirected his irritation and his anger, so he comes home, I've had a bad day in the office dear, and so he's perhaps not quite as well tempered as he might otherwise be.. but that's redirection. Now you see birds do exactly the same thing. Here are a couple of Herring gulls having a row. FX: See arguing. That's my land he says, 'clear off', no it's not it's my land.. FX: Now watch, there, you see pounding the table. That's what he is doing, he's tearing at the grass instead of tearing at his other gull's throat. See. They both look at one another, they both put their heads forward just as you two did, and look see.. heads forward and tearing at the ground. So what's we've got, more desk pounding. What we've got now is another collection of gestures all of which themselves were not done because you wish deliberately to convey a piece of information as a piece of language, but because you just do it anyway, as part of the circumstances in which you find yourself. We've had turning away, we've had redirection, we've had these other curious preening activities and so on which go on when you are nervous. So now, that's quite enough as it were, for the raw material for the vocabulary of these gestures for us to be going on with for the moment. Now supposing I was in a circumstance where these things happened and I wanted to make that particular circumstance very special, so it becomes a special occasion, not only is it a special occasion but I want everybody to see it, and I want everybody to know exactly who I am. Now what do I do in Sir Julian Huxley's terms - I ritualise that, and I now would like to look at a few bits of ritualisation that all of us do, or at least all of us watch. Just take the simple action of walking up and down, now I can walk up and down in a perfectly ordinary way like this and it doesn't convey anything, it doesn't convey anything to you does it? Absolutely not, I quite agree, You might wonder why on earth I am walking up and down, exactly, and it's got nothing to do with what

I am doing, I am just walking up and down and it doesn't convey anything. And you don't say, what a very athletic chap it is walking up and down, or alternatively what a very depressed chap it is walking.. he's just walking up and down. But, if I wanted to walk up and down in a way that conveyed information about something quite other than walking up and down. I could in fact do it. Let me show you how I would do it. FX: MARCHING MUSIC: APPLAUSE: These were the two guardsmen from the Second Battalion the Coldstream Guards who came to assist us on another occasion. And, what was the difference between their walking up and down, and my walking up and down ?

Boy: Much more regularly.

David Attenborough: Ah, you must come again, quite right.

Boy: They both walked at the same pace and they didn't move out of turn.

David Attenborough: Yes correct.

Boy: It was very exaggerated.

David Attenborough: Indeed.

Boy: Much more relaxed than they were.

David Attenborough: I was ? Indeed. Yes ?

Boy: They walked in time to the music.

David Attenborough: Rather like the point that was made over there isn't it, that it was very rhythmic. Yes ?

Boy: They both had tall fur hats on. LAUGHTER.

David Attenborough: Quite right, quite right. Yes ?

REST OFF HIKE.

David Attenborough: I think we've got enough you're baffling me now. I've got quite enough bits of information there, and let me just again try and categorise what we've got. We've got the fact that it was rhythmic, which is very important, and it was exaggerated and it was uniform, all those things you have told me. I am even told I don't know whether it still happens, but I am told that in the Guards you actually, the Sergeant Major has a sort of pair of large compasses which are to tell you exactly how far you are supposed to stride, so that they are made absolutely uniform and rhythmic and exaggerated, and clear and as you said they had busby's on, in other words they had big crests on them in order to catch everybody's eyes.

But of course, you may say well naturally if you want to march, and you have all got to march together you naturally do it that way. Not necessarily. There are other ways of marching. Look at this. This was film that was shot in the 1930's in Nazi Germany, of goosestepping, and here they are throwing their feet way up in the air. You see. Now that's not actually, it's an old piece of film because that was when it was shot, but actually there are soldiers of today who march like that, who goose-step, in South America they goose-step, and I would suggest that what they are doing is actually emphasising how virile and how strong and how aggressive they are. But there is yet another way of marching that we could do. FX: MARCHING MUSIC: Thank you very much. APPLAUSE: Whew.. Now that is called slow marching, and as you will see it is a highly, and I am going to use this word now because we have been looking at it for some time, highly ritualised way of marching, and what is involved is sticking your foot out first - I am sure the Guards wouldn't say this, it's much more complicated than that - but anyway, to me it looks like that. See. Now there is no reason why that should be, give a message of mourning, of sadness, except for the fact that we have ritualised that perfectly ordinary piece of behaviour in order to give by custom and usage a particular message, and so when there is a state funeral the Guards or whoever is taking part in that funeral, will actually march in that way and we will take from that ritualised piece of behaviour the knowledge that it is in homage, and it is in mourning.

Right, now, I want to show you one more.. Oh there are two other bits out of that slow march. Did you notice when they ended they very generously saluted. I mustn't attempt to salute because I don't know how to salute, but they did and of course what does that mean. Fancy taking your right hand and in a particular way putting it up to your forehead and bringing it straight down again. Well there will be arguments about this, but it could well be that what that is from a time when you took off your rather aggressive crest, your hat, out of politeness and sort of submission, and that this is just a ritualised simplification of the taking off of the hat, so it's just a quick touch and down again. Now just as one last example of our ritualisations before we go back to the animals, have a look at this .. Oh I won't show it to you just yet. Many years ago I was lucky enough to be in the South Pacific Island of Tonga, and in Tonga you don't drink tea you drink Kava, and Kava is made from a particular root which you take home and you pound up with a bit of stone on another piece of stone and then you pour on a bit of water just like

mashing tea, and you swirl it around in a bit of a bowl and then you strain it and you drink it and it tastes as a matter of fact rather like mouthwash. But that's what you do. Now kava is a semi-sacred drink so that on very big occasions and this what I am going to show you, is the biggest of ceremonial occasions in Tonga, the Royal Kava Ceremony. You don't make kava just as I've described it, as you would do if you were mashing a cup of tea at home, you make it like this. This ceremony was held.. First of all here is the breaking of the kava, the pounding of it on stone you see he lifts his hands very high, much higher than is actually necessary. Then a specially large kava bowl is brought in to make it very conspicuous and the kava mixer is a very special man, sits behind it in a very very exaggerated position with his arms out to one side, the kava is poured in. Now. You watch the way that he mixes this kava. All it is after all is a question of pouring on a bit of water just as though you were mashing tea at home. The water is poured on and now he starts .. see .. his arms lifting then right high up far more than is necessary simply for the function of making kava. The motions become highly elaborate, highly exaggerated highly stylised, and what is he doing - why is he doing all that in that sort of way? Why does the Chairman, or whoever it is who gives away the football cup, why does he lift it up in a particular slow way, in a stylised way, rather in the stylised way that this man is doing it? In order to suggest to you, or to whoever it is who is watching that this is a very important occasion. This isn't just an ordinary making of kava, this is something quite different. Having done that he squeezes it - it doesn't look very attractive I agree - but then a woman comes along and she takes a cup full, now she is going to take it to Queen Salote, who was the Queen of Tonga at that time and is now dead and this is an historic piece of film, and she takes it across there and you will see something very interesting. There is Queen Salote, and she takes the kava cup, now actually she doesn't like kava, watch.. She just pretends to drink it, you see? What she does is to give a pure and simple touch of the lips and putting it down, she wasn't drinking kava in fact, that gives the lie to it as it were, that has got nothing to do with drinking kava, that has got to do with something else quite different is about the sacredness of the ritual in which the Queen takes part, so that the business of taking the cup she doesn't drink it she just lets it touch the lip and down it goes. Now I've been talking enough about us, it's now time that we turned what we have been talking about in terms of intention movements, redirection and

all the rest of it and see how it applies to animals.
 Now bear in mind.. Excuse me while I just have a little bit of a displacement activity will you ? DRINKS:

What we want to do is to see how you take those kinds of notions, and enable them to signify - to carry the message - that this is going to be a very important occasion, like for example, breeding courtship, and what you have to do with them is as I said to make them conspicuous and to make yourself easily recognisable and to signify that it is a special occasion, and there are many ways that we may do that. We may take these ordinary actions and turn them into something special.

Now then, I need more help. I want two young ladies this time. Who volunteers ? There two, splendid. You two come down. Now you stand there, and you come over here, there we are that's fine. Now there are a lot of bulbs on there and I want you, I am going to turn this board on in a minute and the light will go on you see, and they will start flashing, and what I want you to do is to see if you can find one that you think is special, that your eye is particularly drawn to. Right. Now take your time. FX: No. No. Can you see one - special ? Yes which ?

Girl: This one is it ?

David Attenborough: No.

Girl: The one next to that one.

David Attenborough: This one ? What is so special about that ?

Girl: It is going faster than all the rest.

David Attenborough: What is going on about it ?

Girl: It is flashing quicker, not going on for so long.

David Attenborough: Well that is true, is there another way of describing it ?

Girl: Regular.

David Attenborough: Regular. Correct. In other words that is a regular, rhythmic flashing light all the rest are just going at random, but that one - and I think actually that your eye is drawn to that, particularly once you have seen it - that one is going : on,on,on,on,on. Thank you very much. APPLAUSE: So one of the things that you could do if you wanted to take a perfectly normal action and make it conspicuous to make it special, is to make it regular. Now we do that all the time. In the busy high street of

an evening there are lights flashing on all the time. Traffic lights, cars lights, lights.. advertisement lights. Now of course it is very interesting is it not, that if you want an advertisement light to be conspicuous the advertising agents tumbled to this a long time ago, what you do is to put a rhythmic flasher on it. And it is not only advertising agents, the police know perfectly well if you want to be conspicuous you make a thing rhythmic, ambulances know that if you want to make a thing conspicuous you make it rhythmic, and of course birds know that if you want to make a thing conspicuous you make it rhythmic. Watch these Teal. Watch, see, this is a courtship. A rhythmic bob of the head. You see. It's very short so we'll run it backwards, but it doesn't make any difference running it backwards because the bob is uniform you see. LAUGHTER: All right run it again, run it the right way round now. Here we go. A regular rhythmic bobbing. So that's not just an ordinary bobbing of the head which you certainly can do as part of your everyday life, that's a rhythmic bobbing. But there is more yet that we can do. You remember what I was saying about those particular activities, you can take those and you can insert those into your behaviour, into your breeding behaviour. Let us show you some Bermuda Albatrosses. Bermuda Albatrosses have a particular way of courtship, they sing FX: but see the rhythmic bobbing. See? And a preen, you see? Rhythmic and a preen. Now watch this one. Rhythmic and a preen. Rhythmic FX: Thank you. So there what the bird has done is to take - I can hardly take my eyes from them, rhythmic preen - what they have done is to take the head bobbing and they have made that conspicuous by making it rhythmic and they have taken the preen which was a displacement preen, sometimes called, or at least a preen which happens when you are in courtship behaviour and incorporated that regularly into their courtship displays. Well now the preen of course in that particular instance is perfectly clear to see, it lifts its wings and it preens. But you remember what happened to that salute. The salute no longer was as it were a taking off of the hat, it had been reduced to a little touch of the brim. Similarly with Queen Salote's kava, she didn't drink it she just touched the lip. Now preening the wings, for example in ducks, if you watch Mallard and Gargary, and Shell duck, they actually have little patterns on their wings which they preen in, and always preen in the middle of their courtship. But you see what a Mandrin duck does. A Mandrin duck has a special sort of little preening thing on the edge of its wing there, a great sort of peak which is orange and what it does when it courts is first of all.. above it's head and

then very quickly, do you see, just touched that part of it's wing. That's again. You see very quick. Now that is Queen Salote putting the kava cup to the mouth.. now we've stopped it in mid-action so that you can see it, and that is the Guardsman salute. And of course we would have no idea that that had got anything whatsoever to do with preening were it not for the fact we were able to see a whole series of different ducks, which have a whole series of different preening behaviours in their courtship, leading up to that of the Mandarin.

Well now let me show you one other bit of displacement activity. Or perhaps not, perhaps functional activity.

Now you will recognise that delicious bird, which is a favourite of mine. Oh I am sorry.. That is a (Goudian) finch, and next door to it is a, down there are Zebra finches, now these are Australian finches.. now did you see the Goudian then it wiped it's beak on the perch. Is it going to do it again? Oh do do it again. Thank you very much, it did it again, did you see it just wiped it's beak on its perch. Now that beak, bill wiping is something which a whole lot of birds do. Zebra finches and Goudian finches and many other finches, and you may say it comes just, obviously from a desire to clean the bill. Correct. But it may also be that in courtship the bird did get a rather sort of dry mouth as you might say, or indeed a wet mouth. There is something going on in it's mouth so that whenever it went to courtship it wanted to clean it. And what happened was that this perfectly normal activity became ritualised into part of the standard behaviour, and what happens is that when the Zebra finch for example does its courtship display it always wipes its bill on the perch or the twig that it is sitting on. But the Goudian finch which has that delicious chick which is so marvellously coloured naturally does something rather special and I want you to watch this. This is the courtship of the Goudian finch.

Here he goes, you see he does the bill wipe but he does it very very fast and he does it high up. So that what he has done is to take this bill wiping notion and completely removed it function, and now.. FX: He does a marvellous little jump. And that is probably an intention movement to fly away. The female then does a low little bill wipe, again removed from the branch, now the male is going to do it again. You see? And off he goes on his dance. Now this is so delicious that I want to show you just one more thing, which is very very strange, we are now going to slow it down and listen to his song because we are going to slow down his song as well. FX: Now if you listen to his song now, he is whistling about four songs

at the same time. FX: A low one, and a very high one, and a middle one. So what he has done is to.. thank you very much. What it has done is to take his bill wiping and ritualised it by taking it away from the branch which it happens and speeded it up very fast.

Right well now I think we have seen enough of these source materials of these bits of actions from everyday life and the way in which you can speed them up or simplify them, or make them rhythmic to have another look at the Grebes which is where we started.

So now we can see, the Great Crested Grebe, but first of all this is early stages of courtship and the birds are anxious to show one another that they are mates and they are not going to fight one another so they both avert their gaze from one another, as Johnathan did, and what's more they have then, having got that movement in as part of their normal courtship, it has become ritualised by becoming speeded up and rhythmic. So they are averting their gaze with this marvellous head shaking. Now what will happen next. They have got crests.. did you see that? That was a preen, and that always happens the preen. So the preening has again - they did it again - has again become part of the courtship display, part of the dance. Now this one has got its bill open, and both of them have their bills open then, and that may again be that business which is rather akin to bill wiping. And having done that they then will make an intention movement, or they will do a display which is derived from an intention movement, the intention movement of nest building. Again something that would normally happen in this particular context at this particular moment in their lives of building up towards courtship, but what has happened is that the movement of diving down to the bottom of the pond and picking up a bit of weed, has become again ritualised, it has been put into a whole series of dance movements. Now lets see you do it. Watch. Dive, come on. There we go. And up they come carrying nesting material, but now that's got nothing to do with nesting, or very little to do with nesting, now that has become part of the dance, and just to show you what can happen which is even more exciting, even than our own Great Crested Grebes in North America there is the Western Grebe which is this one, and this does a weed dance in just the same way. Again it is probably an intention movement of nestbuilding, then it treads water in a sort of rather elaborated version of our own Great Crested Grebes weed dance. But then having discarded the weed they then go in for rhythmic pluming, but you see they hardly plume at all. Again it is taking that particular activity, you see they are doing it

together rhythmically, of preening. They are not actually preening any more than Queen Salote was drinking kava. And then, what about that. That is the particular speciality of the Western Grebe. Watch. FX: That is a really delicious movement, and he is going to do it just once more. They come together this time looking with their heads towards one another, doing a bit of drinking, and then.. watch.. FX: up they go. Now so we know what we have seen I hope, so far, is that we have seen that the courtship dance of the grebes, which is an important part of their language to one another which helps them to say 'I am your mate, we are going to mate together, we are going to make a nest, we will raise a family, this is our patch of the lake', it says all those things, has been built up from all these other movements from their everyday part of life by ritualisation. Now in order to do that there is just one further characteristic of the grebe which I ought to mention to you. It will not, you will have noticed perfectly clearly, that the grebe had these feather tippets and crests on it. Now they serve of course, to emphasise those motions that we have been talking about the head shaking, the head lowering, the dipping, the preening, have all be emphasised because .. with these feathers. And if you were a good enough naturalist if you had never seen this grebe alive, never, but simply saw the skin, if you were good enough you would say when you looked at these feathers on its head here, you would predict I think with reasonable luck you would predict that it must use its head in its language of display, because it has those feathers on it. And indeed it is one of the pleasures of natural history that you could go to a natural history museum, and this comes from Tring natural history museum, a branch of the British Museum up in Tring. If you go to a natural history museum you could look at any of these animals and you ought to be able to try and work out why it is coloured in the way it is coloured. Perfectly ordinary animals which you are familiar with, for example, a lion. A lion has a black tuft on its tail, and what's more it has black spots behind it's ears. They are nothing to do with camouflage, but if you actually watch films of lions when they display what do they do? They hoist their tail with its black patch on the end over their back and wave it when they are angry, and what is more they turn their ears round and show the black spots on the backs of their ears. So that one of the things you ought to be able to do, or is a great pleasure to do is to try and work out what these patterns are on animals and how they will give you clues as to what their behaviour patterns are. But there is one animal which has managed to separate these sort of reinforcing

patterns from its body and make them, put them in a quite different place in a way which I find almost unbelievable, let me show you a model. This is Mr Coates masterpiece number one. Now that is a model of something which you could see in the forests of central New Guinea in the Mountains, and when you come across it all I can tell you is that it is unbelievable, you walk through thick forests and suddenly you find a sapling, this is about half scale, a sapling about five or six feet high, and round the side of it it had been plastered with bits of twigs and there is a sort of hedge round the bottom, and this part is absolutely clear. Now these were only seen by Europeans about a hundred years ago and when they were seen people said they must be made by Pygmies or they must be made by some of the local people, I mean who, what animal could possibly make that because there was no sign of an animal there at all. In fact this is the display ground of a bower bird. Not mark you the nest, nothing to do with breeding, that's not quite true, nothing to do with nest making, nothing to do with rearing the young, but bower birds are relations of those birds of paradise that we saw and there is the clue. Now Heinz Seilmann, one of the greatest natural history film makers there is has secured some simply magnificent film of a bower bird, Maypole bower bird as these ones are called, actually in its bower and I want to show you some of it. Here is the bird at the bottom of its bower. It has a little orange crest there. And that orange crest is important. Now there is the bower, and there is the female which has come to visit it, the male bower bird, and what does he do? He suddenly exposes the crest you see like a flame - like an orange flame - and he chases and displays in front of the female who has come to visit him, and this is a display just like the birds of paradise display in the sense that it is clear that the female comes to see, as it were, what the male has got to offer. How splendid is he. And mating will take place here, then the female will go away and build her own nest quite separately and rear her young. There are many different sorts of bower birds in New Guinea and Heinz Seilmann with enormous skill got shots of another one. That is the Maypole and this is a different one, this one is decorated with orange berries, orange pods, orange flowers. And the bird does that itself. The bird collects all these little orange bits and pieces and decorates its bower, again not a nest. And it seems to do it and this is chancing my arm a bit, but it seems to do it.. there it is, almost as though it had an artistic sense. Because when it comes along it will bring a particular flower in its bill and spend, as it has here, and spend a lot of time just seeing where to

put that particular flower. Here maybe.. no not quite right, you see. We had better go over and probably that is the place to put it. So here you have an animal that actually has developed a way of making its display quite separate from itself and this is the time for me to introduce to you Mr. Coates masterpiece number two. That is a model of the bower which you have just seen. You see it has a sapling in the middle, it's got a roof and it goes right the way round. Mr. Coates masterpiece number three. This is a bower of a species of bower bird which to my knowledge has never been filmed. I have been lucky enough to see these two, I have never seen this in the wild, and I have never seen any film of it. But the reason I have got these three bowers to show you is because I have here, again from the natural history museum, skins of the bower birds that make bowers like this. Now this is the skin of the Maypole bower bird. This is the skin of this bower birds that makes that one, and this is not actually, but very closely related to the skin of the bower bird which makes the most complicated nest, bowers of all. Decorated - that's decorated with flowers - but this one is even more complicated with an even more thorough roof to it, and even more heavily decorated with flowers. Now what do you notice about these three?

Boy: As the nests get more complicated the crests get smaller as though they transfer it to the other.

David Attenborough: Have I asked you that question before? Quite right. I am delighted, that is exactly right, and what is more only ten years ago there was an ornithological book published by a very distinguished scientist who said that he had, that nobody knew why there was this change in bower birds. So what you have just said is something which indeed was first pointed out by the greatest expert on bower birds and birds of paradise, who tragically is dead now, Tom Gilliard. Tom Gilliard said just what you said, and indeed it is right. So that what we have here is an example of how a bird has managed, a relation of the bird of paradise mark you, has managed to somehow in some miraculous way of evolution, have replaced the beautiful feathers that it has by beautiful objects which it can put separate to itself. So they become something which it can keep in the different part of the forest, and of course that has got lots of advantages, because having big plumes is a rather dangerous business because it draws attention to yourself, and so these birds managed to, as I say, to produce separate objects of splendor and beauty for to show off to the rest of their community, show off to

other males and indeed to females, and of course that is actually what we do. I mean, we will put up art collections or big libraries and thank goodness that people do this, to show how benevolent they are, and how altruistic they are, and how much they care for other people and they do it by putting monuments to themselves and that is what these are. Monuments to the creators the birds, and just as one final demonstration let me show you know the behaviour of another bower bird - the Great Grey bower bird - which isn't actually as closely related as these three, but which lives in - not New Guinea - but Northern Australia. Now he builds a rather simpler bower as far as the sticks are concerned, but he collects lots of white objects white and silver and shining. And he will collect anything like, of this sort, there is a story about an Australian bush-wacker who had a glass eye who actually went bathing and took his eye out and left it on a tree stump and when he came out of the river it had gone, but being an experienced bush-wacker he knew where to go, he went to the nearest bower birds nest and there was his eye staring up at him from the middle of the bower. But you see this bird, what he does is to use these particular objects which he has collected, these jewels which he has gathered together from all over his territory and when the female comes he.. well you had better watch what he does. He is rearranging them just at the moment. Now. FILM: Here he is, now you see he's got one of his jewels in his beak, the female has come into the bower prepared to be impressed by him, there she is, and what he does is to tip his head and actually he has a tiny remnant of a crest just a little lilac flash on the top of his head there. All that is left, as it were, of the ancestral memory of the bower birds long crest that we have just seen there, and he tips his head forward as though to show it to demonstrate to the female while he is showing the jewels.

Thank you very much an excellent film again by Heinz Selmann.

All right, well that is something about ritualisation. All I can tell you is that we have just pecked at the very very fringes of a very complicated subject.

Next time I will tell you about foreign languages that animals speak.

APPLAUSE: