



The Naked Ape in a New Light - Sexual Biology of Humans and Other Animals

Thanks a lot. Can everybody understand me? Am I loud enough? Too loud? Louder? I should be louder? Maybe – yep. That’s probably louder, right. This – is this better?.. Okay, so I’m going to speak about the Naked Ape. Those of who are British, and I gather that’s hardly anybody, would certainly know the title of that book which was written in 1965 by Desmond Morris. It is about viewing human sexuality as if humans would be just other animals, and that is pretty much the party line I take today. I try to explore the sexuality of the Naked Ape – that is humans – in comparison with other non-human primates, and I do that because I’m a biological anthropologist: these are people who try to reconstruct human evolution by comparing a specific member of the order of primates that is *Homo Sapiens* with the other members of this mammalian order, which are other primates. Erm, monkeys and apes for example. And you see here the title written down, I will now work here with – it’s a very fancy theatre here, let me see here... lights... no, let me see. Ah. If I go even further down, let’s see, how would this be, that’s probably... This is actually too dark because what will happen in a short while I will give to you a little hand-out so you can – that you have something to do and you won’t fall asleep. This is called ‘Reclining Nude’. Yes, you are supposed to laugh if you understand. It’s actually a painting which hangs in Philadelphia, shows a naked gorilla on a carpet, which is nicely programmatic for my view which is about nature in culture. Or culture in nature if you want. It’s about the nature of humans or the nature of human culture as far as it relates to sexuality. The guy who started it all was Charles Darwin, in 1871 he wrote a book which extended his view that all organisms on earth have a history and are related to each other – extended this view of evolution to humans. He didn’t dare so for about twelve years since he had published the *Origin of the Species* in 1859. But then of course he was derogated, because how could humans be animals? And he was depicted as a venerable orangutan. Nowadays, there are very few people who... this is a touch screen thing. Now a flashing light comes on, warning, warning, no. Do you wish to turn off the video projector power? Yes. Interesting. Very interesting. God knows what will happen here. Very few people will doubt that the similarity between these two feet. The left one belongs to a *Homo Sapiens*, the right one belongs to [...], that this similarity is due to common ancestry, that an evolution united the common ancestor of these two forms. Now, more people – or, let me say, few people have a problem with the hardware, that is, with how our bodies are built and that they are somehow similar to other primates. But if it is about our wishing, our dreaming, our behaviour – if it is about the software of one’s life, then people are more reluctant because if we imply that natural history influences our behaviour we somehow think that perhaps our free will will be impeded. So more people have a problem with thinking about that.

Now, I will talk about a specific type of behaviour, that is male-female associations. And you can only come up with four distinct possibilities. The first one, if a male and a female lives together that would be monogamy. The second one, a male and a female – sorry, one male and multiple females, that’s polygyny. Now this is a very fancy term which you can use at cocktail parties: multi-male, multi-female, that’s polygynandry or group marriage. And polyandry is one female, multiple males. Erm, - oh, yeah – I will give to you a handout and you can then fill in certain correlates about these different mating systems, if you like. If you don’t like, don’t do it. And you may then actually be able to trace my thoughts, if they make any sense to you. And you find the – you find these categories already pre-printed on your sheets. And then hopefully – just pass the handouts to the back row and everybody should hopefully have one. Now, these are the statistical possibilities, how you can actually live together as a male and a female. These three ones, here, are called polygamy, and a lot of people think that polygamy – here are some more – a lot of people think that polygamy is the same as polygyny. But every – every constellation here whether multiple spouses or mates is polygamy. So wherever there is a multi-, that would be polygamy. Polyandry is also polygamy, right, because *gamus* simply means spouse. Now, if we talk about associations, we have to be clear about the level which we are going to analyse. The pure grouping structure – who lives with whom – may or may not be identical with the mating structure, the simple example being you can live in monogamy with one partner, but you may have extra pair copulations – EPCs – then, your mating structure would not be monogamous. Even so, you would live with only one other person. You can breed with the partner with whom you live or with your EPC partner, and depending on from whom you were to then have offspring you may or may not have a monogamous breeding system. So these levels do not coincide necessarily. For evolution, the only thing that really matters is the bottleneck of breeding: who is your breeding partner and with whom do you create offspring. So for that reason, for the purpose of this talk, I typically talk about breeding structures.

There are various types of selection which Darwin explained, Natural Selection being all the forces that act on an organism which come from its environment. Like, is there enough water, are there fires, how is the food distributed, are there predators, things like that. And sexual selection, being the forces brought upon an organism from within its own species, from typically the other members of the species. Either the members of the same sex – then it’s called intra-sexual selection – or members of the other sex, then it’s called inter-sexual selection. These different types here – and now you can actually

fill out the first table, that's the top table, and this graph here will slowly slowly fill up this table. There is a nice – there are nice rules of thumb about the correlates of morphology and sexual behaviour and they work as follows. This is a deer, a large male deer, and you may know that red deer females are much smaller than these males and that they don't have antlers. If the males are much larger than the females that is typically a result of male-male competition for access to females. It's typically a result of intra-sexual competition amongst the males. And what we see is, if there is strong intra-sexual competition amongst the males, polygyny will develop, if one male is able to monopolize various females. In that case, this male that is able to monopolize is typically a very strong male, and he is bigger in body size than other males, the biggest one would get the females and he is certainly bigger than the females. So males are much larger than females if we have polygyny. If you go in a zoo or so – oops, what is this? Oh, interesting. Very interesting. I pressed the zero button, you know if I press the zero button I have to start all over. I have to start all over... no, I will just... I will just... aha. Very interesting. Dangers of touch tone – touch screens here. Aha. And that. Whoops. Okay. What I wanted to do was actually focus, let me see what happens now. Maybe another warning will come up; no. Erm, okay. If the males are much larger than females we have – we can predict that it's polygyny because the largest males will out-compete other males. If actually the males are smaller than the females, then there is competition amongst the females and we can predict that the mating and breeding system is polyandry. If they have the same size – males have the same size as females – then normally we can be quite sure that it's monogamy. I show you intra-sexual competition amongst males in action here. These are two Hamadryas baboons who are fighting with each other, and of course there will be a winner and a loser. What happened now? Whoops, it must be... It's actually the first time I've used this here. Now, anyway. Okay. And the winner in this case will be this individual. He's much larger than the females so there's a strong sexual dimorphism. And he will take all the females with him. There is a loser too of course. And the loser will suffer wounds like this. And, on average, the losers are smaller than the winners. And there is another system where you can actually see this – these are Gelada baboons, so the male is much larger than the females, it's a harem structure. These are other primates from South America. They are called Marmosets, and here males and females have the same size. I'll just make it a bit darker. Because here you can actually see a baby coming out of the female – this is a newborn – and the male is licking it and taking care. This is a monogamous system where males and females have normally one partner, and for that reason they have the same size because males do not opt for the strategy to outcompete other males with their physical force, but they try to attach themselves to a particular female because these females are actually in need of help, of paternal investment. In a species like this, Rhesus Macaques, you will find it difficult again to tell males and females apart. This is a male – this is a male, they're about twenty percent larger. This is polygynandry – multiple males, multiple females. So, the sexual dimorphism, that is the difference in size between males and females, is mild.

Now, if we talk about sexual reproduction, then of course we have to talk about those organs which really matter in sexual reproductions, and these are the genitals. Charles Darwin didn't really do that – he was too prudish, perhaps, or it was simply something that didn't occur to him that it should be addressed. He lived in the Victorian age and one didn't really talk about matters of sexuality too openly. Now, the person who brought the so-called genital sexual selection onto the scientific platform was Roger Short in 1981. He talked about the reproductive organs as far as they are subject of sexual selection. We did so far only talk about somatic sexual selection: That is, the influence of sexual selection on the overall body shape / body size. That's called somatic sexual selection. And now we will address...

These are [...] from South America, and if you look between the legs of these individuals – yes, you are right, these are testicles. Right, these are testicles in which the sperm is produced and stored for a certain time. And yes, you are right, these testicles are particularly big. Now they are particularly big because amongst these males a mechanism is in place which is called Sperm Competition. Females mate with multiple males, and since they do so the ejaculate – the semen – of various males will be mixed in the genital tract of the females. And then it's like in a lottery, those males who've put in more tickets have a greater likelihood of being the winner in the competition which is a competition for fertilising the egg of the female. And, if females mate with multiple males there will not be an arms race for somatic differences, but the arms race will take place, so to speak, with the genitals. And the testes of males who live in multiple female structures: these are those here in – sorry, these are those here, where females mate with multiple males, the testicles of those males tend to be very large. Now equally, you may think that a harem holder who has a lot of females would need large testes, but it's just the other way around. A harem holder has kept all other males away by somatic sexual selection, and, in that way, can be sure that his females mate only with him alone. He doesn't have to be afraid of sperm competition, and his testicles can be small. That's the case here in polygyny. In monogamy, we normally find middle-sized testes, because monogamous couples live closer together, they are spatially not as far separated as harems: because harems will concentrate in a particularly good area, and here is another harem, and it's not so easy to go from one place to the next. But monogamous couples, so to speak, they tend to live next door to each other. And there is always a danger of sneaking copulations, of extra pair copulations. And for that reason there will be mild sperm competition, so that the testes of monogamously grouped species are middle-sized. You can fill that in in your hand-out, you know that's down the second column. They understand the system by now.

This is a harem holding monkey from India. He has very small testes, at least in comparison to this individual, who is the Rhesus Macaque who lives multiple-males multiple-females so these testes are large. Right, there is sperm competition.

These creatures here are from South America, they are Tamarins. And, they are kept in zoos in breeding pairs, in a monogamous situation. And they breed nicely there. But the trouble is that the testes of the males are very large relative to their body size. So this seemed to contradict the theory of sperm competition, until it was found out that in the wild they actually tend to live in polyandrous groups, that is one female with multiple males. In that case, of course the males would

have to face sperm competition from other males. And, since it's only one female they have to address their sperm to, the sperm competition is even more severe. And the Tamarins live in one female, multiple male groups and for that reason the males have large testes.

Sexual – genital sexual selection isn't just something that males are subjected to. Females show signs of that too. This is what is called an anal-genital swelling, because it's around the anus and the vagina. It is also called the sexual skin, and females of many primate species tend to have such swellings. And they're particularly pronounced around the time of ovulation when they are fertile. Males, around the time of ovulation, show great interest in these females and they try to investigate whether this is really the day when they are most fertile. Because they don't want to waste their sperm, you know. Because then they would have less of a chance to fertilise another female. Now, why do females – why do they have these swellings? It may – there are various theories out there; one theory says that, well, females want to incite competition amongst the males. They show how wonderfully fertile they are and so males will all come and hang around, and then of course the winner will be the best male, he will be able to mate with the female and so the female gets the genes of the best male. It can also be that it is not a mechanism to incite intra-sexual competition amongst males, but that it is a mechanism that reflects inter-sexual competition amongst females. Perhaps this is what is called a costly signalling system. It is pretty dysfunctional to have such tissue which you carry around: bloated, it's heavy, it impedes your movements pretty much in the same way as the breasts of human females impair human females from walking. And they are pretty dysfunctional too, because one doesn't need permanent breasts, a) if one is not lactating; and b), if one is lactating, if one is giving milk to a baby one doesn't need big breasts either because other primate species don't have breasts and they do not have permanent breasts at all. But these clearly visible accumulations of tissue: breasts, or in this case anal-genital swellings, show something about the health of the female. And about her ability to cope with such a handicap. It's called Self Handicapping. And in the way one is able to Self Handicap oneself, in the way one is able to maintain non-functional body structures, that says something about the health and physical fitness of an organism. And males may, on the basis of that, select the females. The system here is that anal-genital swellings do exist wherever there are multiple fem... – sorry, wherever there are multiple males around. Because it seems to have something to do with making males understand when one is fertile. There is no point of addressing multiple males because in these systems here there is only but one male, so there is no point of advertising in the hope that one gets the better male, because there is only one male.

The next correlate is the length of the coitus. The coitus is sexual intercourse, the length of the copulation. And, as you can see here, these Hamadryas baboons are mating and they must mate for a very long time because a lot of people have come, accumulated here: particularly this father is very, you know, clear that he has to show his daughter the giraffes and the other – look over there, look, the long necks of the giraffes. The duration of the mating in Hamadryas baboons is long. And there is again an interesting correlation that goes like this: If there is competition, if there are multiple males around like in these two systems, the length of the coitus is short. If there is but one male, there is no competition, and the length of the coitus, the length of the sexual intercourse is long.

There are many other correlates of breeding systems and sexual morphology. And one could address the penis shape, the speed and form of sperm, the muscles which are implanted in the semen leading and semen ejaculating parts of the male reproductive organs. And that's an area of research which is becoming more and more fashionable, under the slogan of Cryptic Female Choice. It is choice which females exert on males which cannot obviously – which is not so obvious, it cannot be seen, it takes place within the female, within their reproductive tracts, and for that reason it's called Cryptic Female Choice.

I want to apply, now, these principles to the hominoidea – these are the apes and humans. And these are the five taxa which belong to the hominoidea: gibbons, orangs, gorillas, chimpanzees and humans. And there's a second table and it will fill up as I go through the various groups. Of course, we are all interested in human sexuality, but since I have this idea that humans are other animals I compare them properly with their closest living relatives, these are the hominoidea, and this is roughly how closely they are related to those. We are closest related to chimpanzees, then humans and chimps together are – have the same distance of relationship to gorillas, then come orangs and then come gibbons.

I start with gibbons, who live in south-east Asia. This is from – a picture from Thailand, Lar gibbons. Males and females have the same size; even so they may have different colours. And they have this custom of singing together. Previously people thought that this says something about their commitment to live in pairs, that it says something about their wish and will to reinforce the pair bond. You can see here that this is a female, you see her nipples, and this is a male. And she is singing, in this case these are Siamangs, they are a different kind of species. People said, well, when they sing together they are dueting and this dueting reinforces their pair bond. My own research in Thailand showed that that is unlikely to be the case. What in fact is happening is that this female is calling very loudly, 'I am pretty, I am young, I am fertile.' And this guy here, he has to call with her to say, 'no, no, no, no, no, that may be, but somebody is already here to guard her.' So instead of being an expression of an existing pair bond, it is a test of the partner's ability to keep other males away. And you see clearly from his face that he is not very pleased that his female here is singing. I mean, he doesn't like her to advertise her beauty, you know; he would rather have her shut up. But he can't do that, she sings and so all the other males in the vicinity can hear, 'oh wow, there's a really nice female. Let's go to her.' Anyway, the dimorphism between the sexes is not very pronounced, because males are unable to monopolise females so males stick to one female.

These are skulls which I photographed in a museum, and in previous times people went out with their shotguns to do research on primates, and they would do what is called collecting specimens. On this expedition about 197 gibbons were shot. That was in the 1930s. These are more gibbons than probably exist nowadays in Laos and Vietnam together. The times that people can go out with their shotguns and collect primates, as the euphemism goes, are long over. And, of course, biologists have not contributed to the decline of these species in the wild. That is simply due to habitat destruction and to killing the animals for food and for the pet trade. But of course we should be aware that these animals are so similar to us that it is a big ethical question whether at all one can go and kill them. I believe, of course, that this is no conduct that is acceptable in any way. Males and females can only be distinguished between because the collectors have written it here, you know, that's a male, that's a female, otherwise it would be very difficult to do that. Now, the correlates line up as follows. Males have the same size as females, so the female is 100% the size of the male. The testes size is 1.0, whatever that means. That's in [...] of the body weight. These are middle-sized testes because there are occasional extra pair copulations: occasional EPCs which lead to mild sperm competition. The coitus is long, it lasts one minute. Now, you may have personal data or other data which would render the judgement of one minute as long as something that is not very, you know, a very good judgement. Now, one minute is long in relation to what I will show you with chimpanzees, where the time from intromission to ejaculation lasts seven seconds. So this would then be roughly ten times as long and by that standard it is long. There is at the most a small anal-genital swelling, directed to the neighbours somehow, and the main breeding system still seems to be monogamy.

Now we can go to oranges, orangutans live in Borneo and Sumatra nowadays. And the full-blown males, I will show you how they look like. They have these facial features. Now, that's a riddle. Why do they have these huge cheeks here. Some people thought that since they are calling into the forest – they have these loud calls – that it is something where they can nicely hear what the others are calling, but the trouble is it's totally mis-constructed because the ears are actually behind this big cheek – cheeks. So that doesn't really work. So the other idea was they have these things in order to broadcast better, like a megaphone. That's a better idea, but then they are quite excessive for that reason, and it is more likely that it is again the handicap principle at work. This is a very costly tissue: it can, if it's wounded, get easily infected. It is very heavy. You have to carry it around. And only individuals which are able to handicap themselves in such a way are probably worth mating with from the point of view of the females. This is a properly self-handicapped male and he knows it. He can be self-confident. He can carry tissue around which is non-functional and do stuff which has no meaning whatsoever except showing that he is physically fit.

There are other males though, which are males and even if they are ten, fifteen years old when they should be fully grown, they are not fully grown. Those are males arrested in a sub-adult stage, the reason being that their competitive ability is probably not good enough that they could really compete with these full-blown males, and so they pretend that they are actually sub-adults. Even so, they are grown-ups. In zoos, at times, it is then found that a very big male lives with a smaller one of these males and if the big male is removed the small one will grow to its big size immediately. The smaller ones in the very end can lead to a process of selection called disruptive selection, where you would have these huge harem-holding males and you have then smaller males who are sneakers: they are quick and fast, and they go quickly to the females, mate with them and then they run away. Because the big ones, of course, they have to eat a lot because they are so big and they are slower. So as soon as a male is very big, you tend to get disruptive selection, where you have an alternative morph, a sneaker morph, which is then switching to another strategy. This may well be the case in orangutans. But by-and-large, these males are able to monopolise various females successively. So it is a type of polygyny.

They mate in this position which people have called *more canum*, in the way dogs do it. There is another vernacular expression for this which I don't want to use. But the Latin term is *a tergo*. Sounds much better than 'the way dogs do it'. But people think that if there is dorsal-ventral mating, that is males having their ventrum at the back of the females, that this is how primates other than humans do it. That is wrong, I will later show you examples. In any case, after a while there may be a baby born. You have the umbilical cord here. It takes more than nine months to produce such a little one. And then females will eat the placenta. When they do that, we wonder why. Now, it may be that this would attract predators, it may be that it facilitates the bond between the mother and the offspring by priming the hormones of the mother somehow. It can also be that it is nutritious, even though it may well be the other way around, it may contain toxins, we really don't know. There is another theory which says that humans are the only primates – or there is another definition, saying that humans are the only primates that do not regularly eat their placenta. We do other things with our placenta, so nowadays one is asked in the hospital, 'do you want to take your placenta home?' perhaps, you know, bury it in the garden and have a tree or something. If not, it's sold to the cosmetics industry and the cream like [...] is made from it, and then the definition would be that humans are the only primates that smear the placenta into their faces regularly.

Now, looking at a picture like this, this is a mother who loves her offspring. Who loves her child. And I use this term consciously because I think it's utter nonsense to assume that the feelings of such a mother are very much different from the feelings of the typical human mother towards her infant. In that way I am anthropomorphising, I'm talking about non-human primates in the way I would talk about humans. I think this is not only justifiable, I think it is in fact the only good way to do it. Because efforts to be objective about organisms which are so similar to us can only go as far as we are able to be objective about talking about humans. And, moreover, I believe that it is time to realise that creatures like this which are people according to my understanding, which are persons, that they can definitely not be exploited for the welfare just of humans by subjecting them to biomedical research. I believe that they have basically the same rights as humans have, and that these rights should be properly addressed and properly acknowledged in human societies.

Now, back to the sexual biology of the orangs. Males are much larger than females because it goes with the polygyny system. The testes are small, there is no sperm competition really for the males to face. Coitus is long, fifteen minutes, you may think, especially if I tell you that they can do it hanging down from trees, head first, hanging on with the legs, you know, that's really interesting in that case. There is no genital swelling. Polygyny. If you want to write this in your tables then you're welcome to do so.

The next group I have to address are the gorillas, and this will come again so if you're unfinished you can do it when the gorillas are shown. Famous for allegedly liking white females like King Kong, but nothing could be further from them in reality. Huge sexual dimorphism, males much bigger than females. This is a harem holder who will be able to monopolise a couple of females for a period of time. A group of gorillas in the Virunga Mountains in east Africa. Here you have a Silverback male who is surrounded by various females with their offspring. These females look as if they have no choice: she may think, 'oh my god, he is the guy – he is the guy.' But in fact she made a choice, because it is not that gorillas can take over a harem. When they defeat – when the males defeat another harem holder, the females make up their minds: they may or may not go with the winner of the competition. They may choose another male. So in fact she shouldn't complain at all. She made a choice. You know, she decided to stay with this guy who now thinks, 'what can I do to please her?' He is certainly not likely to please her if she has any feelings which are at times attributed to human females, that it that females have an interest in sex, because sexuality is very brief and short amongst gorillas, for the very reason that there is no competition to be faced, so the male can save pretty much everything he has, he can save with respect to his genitals, they are very small as you will see in the next picture. They do mate in the this position, which is *more canum*, but they do also mate in this position which is called *more hominum*, in the way humans do it. It's also called the missionary position, but this picture is testimony to the fact that the missionary position existed in Africa long before the first missionaries came. So, this ventral-ventral position is something that we – we find under – we find in gorillas. The genital of a male gorilla, which is the largest primate on earth, the largest living primate on earth is the male gorilla, is even in absolute terms one of the smallest. Both his testicles aren't worth mentioning and certainly his penis isn't worth mentioning. So, this is a mere two centimetres, which doesn't mean a thing to you because you think in inches, but even in inches it wouldn't even be an inch. So, this shows that gorillas compete heavily through somatic sexual selection, they have – are able to keep all other competitors away so they could save all the energy that would normally go into their genitals. And then, a baby may be born. They are rather skinny, not chubby like human babies. This is a few minutes after the birth, a picture taken in the Virungas. Our table fills up in the following way. Males are much larger than females, almost the same sexual dimorphism as in orangs. Very small testes, this is as small as it gets. 0.2 [...] of the body weight. You know, if you don't know what [...] is, this is the stuff that you shouldn't have in your blood while you're drinking, so it's something very little. The coitus duration is still long, 1.5 minutes. The anal-genital swelling isn't existing, nobody to address it to. It speaks for a polygynous system.

I'm now approaching chimpanzees, which may or may not contain two species at least, the bonobo and the common chimpanzee. But nobody really knows, maybe there are three, four, five species depending on how we want to define what a species it. But they more-or-less look like this. And, it's difficult to pick out the males. I believe actually – this is a male, here you can see his penis and his testicles. And these are females. They have a polygynandrous setting, multiple males and multiple females. It is difficult to tell males and females apart from the skulls. And around the time of ovulation, females, around the time when they are fertile, have these pronounced swellings – anal-genital swellings. Males will then zoom – zoom in on these fertile females and females will mate with multiple males. They may mate with twelve males in a period of two hours, and then there is a lot of semen deposited into the genital tract of the female, and then there is a big mess because it all leaks out, and the chimps like to fight over the semen which is leaking out, probably because it is rather nutritious. But, erm, it's a very messy business, sex amongst chimpanzees. If females are infertile, they look like this. This is a detumescent female, which doesn't have an anal-genital swelling. These portions of the skin are all wrinkled up, and now I will show you how it looks like when she is fertile, when she is handicapping herself. That's the same female. You know, I mean, these can be huge, these swellings. And of course, they tell something about the ability of a female to build up such tissue, which is not so easy. If she sits down, it may get dirty, she may get scratches, it may get infected. So if it looks healthy and shiny, males will know, well, this is a female who knows her ways around. Pretty much in the same way, we can interpret the pictures for gorillas. Remember that gorillas do not have swellings. And in fact this is a picture of an infertile gorilla female, these are her labia around her vagina. And around the time of ovulation, that's the next picture now, it looks like this. Now, this is not very conspicuous. It is more-or-less the same degree of swelling as we find it in humans, in human females, where around the time of ovulation the vaginal region is also a bit tender and there is a slight swelling of the labia. But it is not conspicuous, it is not very obvious.

Now, in chimpanzees there is a tendency that if females are very fertile that they may get certain – that males may treat them preferentially, for example by providing them with food. This picture that Frans de Waal took, a bonobo male having two oranges, he – he says in the description to the picture, and afterwards he gave her one orange. We wonder what he did with the second one. Now, in any case, you see here that they mate in a ventral-ventral position, *more hominum*, in the way humans do it, and males have a hard time dealing with the fact that there are multiple males in their groups who all want to mate with the females, and so these big balls develop, the big testes develop in the males because they face severe sperm competition. The table then, reads that males are 10 to 15 or so percent larger than females, that they have huge testes, you see this is more than ten times relatively larger than those of gorillas, and this is really short: seven seconds. Now, for whatever reason I have the German word in here, which – which reads 'kurz', but is even more pathetic than the – than the

British word, or the English word 'short'. So I left it in there. The anal-genital swelling is pronounced, and we call this polygynandry.

Now we are interested in humans. Humans are treated here as just another primate, in this picture from a private collection – I'm the private collector. We have birds who are copulating and we have monkeys who are copulating, and of course we have humans who are copulating. And somehow there should be a system in all of it and humans should be interpretable in the same ways as other animals, that's what I want to do in this approach, the Naked Ape in a new light, because since Morris wrote his book in the 1960s, field research and research on primates has made large progress and it's very different from what he thought how it is. Now, these are the basic facts. Males are a little bit larger than [...] percent. Now, this I have from a book, Masters and Johnston, coitus duration two to ten minutes, which says that it is long, you know. Anal-genital swelling: no. And the question is, what is the main breeding system? So, I take these findings now and I try to test it against the various – put on the lights, oh sorry – I test it against these various factors. That is your third table. Sexual dimorphism: if males should be a little bit... What is this now? Oh, right, this is what we have, right... Erm, there is nothing that speaks for polyandry – sorry to say that, you know, very unlikely that the original breeding system of humans was polyandry, that females regularly monopolised various males. Because, everything should be different, there should be a swelling, there should be a short coitus, the testes should be large. And females should be slightly larger than males. So, that's not very likely. Still, we do find polyandrous settings in humans, for example in Tibet where these Tibetan – this Tibetan woman is depicted with three of her five husbands. This is not her child, this is her third husband, who is the brother of the two others. In Tibet, one doesn't really want to split the arable land, because that would mean that nobody would have enough, and one needs a lot of helpers who farm in these – under these very difficult conditions. And so this system of a non-monogamous mating and breeding and grouping evolved. Polygynandry is also rather unlikely. The only thing that really fits in is this here, that males are about 20% larger than females. And we do find polygynandry in an extremely low proportion of human cultures. This is a picture which is not depicting anything resembling polygynandry, I just took a picture from India because in South India there was a group of peoples called the Nayar, where males and females would mate promiscuously, more-or-less, and it wasn't encouraged that couples would form because the males would go to frequently serve in warfare. The idea was that if they would be emotionally attached to children or a wife, that they wouldn't like to fight. But this system of polygynandry, by-and-large, is very, very rare. Monogamy has a lot of plus points, so to speak. All this is in agreement with a monogamous system. The only thing that doesn't really work is the sexual dimorphism, because in a strictly monogamous system we would expect the males to be exactly the size of the females. There are a lot of monogamous societies in human – in humans – or let's say, not a lot of monogamous societies, there are a lot of monogamous couples: more-or-less monogamous, of course. But, it is something that occurs regularly in about 15% of all cultures. Polygyny is the original grouping/mating/breeding system of early humans that has the greatest likelihood. The only thing that doesn't really fit in is again the lacking degree of sexual dimorphism. For full-blown polygyny, one would expect males to be much larger than females. Now, this is a polygynous setting in the United States, a Mormon, look how proud he is here with all his wives and children. When they wanted to join the United States of America they did have to do away with polygyny in the state of Utah, because so-called democratic states don't like it if there is a polygynous setting, because these lead to nepotism and they are difficult to control. Democracies rather like nuclear families or even singles, because, you know, they will not start to form a state in the state, so in pretty much all so-called democracies, there is an insistence on just monogamous marriage. But in many countries on earth polygyny is still practised, and in fact it is the most prevalent form of marriage. If we go with a sample of George Peter Murdock of 1967, in 849 ethnic groups occasional or common polygyny was practised 83%, and, this is very rare, and monogamy is the rule in about 16% of cultures. That's not people, that's cultures.

Now, this would be the conclusion, if you want. Is there a natural type of human marriage. Answer: in nature, males and females associate in various ways. A tendency for polygyny might be inherited from early hominids. However, breeding systems are compromises resulting from individual strategies of reproduction, and they vary under different socio-ecological conditions. That means, even if there is an inclination to do a certain thing, it doesn't mean that there isn't a variation on the theme. It does also not mean that it would be justified, in any way, to behave one way or the other, because there are so many things that occur in nature that we do not like infanticide, perhaps meat-eating, very heavy competition, up to the killing of conspecifics. There are other things in nature which we do like, perhaps caretaking of offspring, things like that. And all these things are from the point of view of morality. In the first instance, neutral: it doesn't matter how it is in nature, it's just interesting to know how perhaps it is. And you see here these big variations amongst the hominoids, and then this big intra-species variation in humans. So there are various forms possible within humans. Now, I have to tell you that this picture is not very correct either, because research now shows that there is a very great degree of flexibility in other primates too. Mountain gorillas, whom I showed you as the main examples for polygyny, have polygynandrous groups where there are two males in the group 40% of the time. In gibbons, we find all this stuff. Yes, monogamy most of the time, but there is polyandry, polygynandry and even polygyny in the groups. So, they are also flexible in some ways. And that is the big characteristic of primates, that their behaviour is very flexible. The Original Sin, here depicted as something that orangutans are doing, a female not giving him an apple, I don't know actually why, because they would like apples too, orang males, but he gets a flower, maybe they are not so gender stereotypical. Anyway, the original – the Original Sin, if you want, has certainly occurred before humans inhabited this planet. And this is my last picture, it shows the German evolutionist, Hans [...], who at the time when Darwin turned 100 years, that was after his death, of course, he is presented with a halo, assuming that Darwin sits in heaven. So this assumes two things: a) that there is a heaven, which is, or is not likely; b) which is much more likely, that Darwin has a soul; but c) which is most likely, that if Darwin has a soul that our closest relatives do have a soul too and that they sit rightly with Darwin in heaven because, as I pointed out, they are persons in their own right. And I, of course, do not maintain that from a biological point of view anybody has a soul, but I

believe that if we believe in things like that it is worth believing that our closest relatives are very similar to us and would certainly deserve a soul. So, I came from sexuality to soul, and you can then do your own soul-searching when you think about this lecture. Thanks.

So, I'm supposed to ask whether you have any questions. Probably you don't even know how to – how to say – you probably all want to ask about polygynandry, but then you would not pronounce it properly.

[question] I have a question. Considering that there are so many different types of possible behaviour, why do we have social codes which enforce monogamy, why is that so common?

Yeah. One reason may be that males who are very powerful, they want other males to behave monogamously, so they tell them that they should be monogamous, of course hoping that they themselves don't have to be. And in societies where one wants to be rather democratic, it is – the other problem is then social stratification, that some have more than the others. So somehow you have to, at least on paper, do away with the idea that it's alright if some have more than the others. And then there is what is called 'socially imposed monogamy' for perhaps reasons that have to do with religious conviction or political conviction, but I never find these arguments very convincing, let me say, because what we do see in fact still is that males who have more resources, they tend to have more partners and reproduction. Times are of course changing, and the way females become economically independent they tend to not care about what previously was the provider male. And so most divorces nowadays are initiated by women who, for probably the right idea, assume that the male is good for nothing unless they provide something and if the male is not needed, that then they can also be divorced. But it is a bit difficult to jump into [...] politics with an analysis like that.

[question] But does [...] an evolutionary advantage over other species?

I wouldn't know, why? Cockroaches...

[questions] I was just wondering, do any of these primates indulge in same-sex behaviour?

Yeah, it is - yeah, homosexuality or same-sex behaviour is very common, and actually the coming Thursday, this Thursday at one o'clock, during the Lunch Hour Lecture at UCL in the Darwin Theatre, I speak exactly about that. I speak about same-sex [...] in nature. It is very common, and it's only that researchers were very [...] reporting it, because it's somehow embarrassing [...] but the more we know about behaviour in the wild, the clearer it is that homosexuality is [...] sexuality in non-human primates too.

[question] [...]

Not in primates, but in species like fruit flies and so on there is research which shows such mechanisms, but that's not too difficult to assume because all it needs is [...] hormonal [...] and we all the time feel such [...] under stress we don't do certain things, we don't look as good as we normally do. And you can just assume that if a certain pressure [...], that we will start looking much healthier and in ways that we will also walk around more confidently, and we will [...] all sorts of stuff which is dysfunctional which normally we wouldn't. So...

[question] [...]

It could very well be a pheromone. You know, olfactory signal. This – I mean, there is research in humans, [...] there is reproductive competition amongst [...] females, via pheromones [...] there are all these t-shirt sniffing tests [...] conducted, in London too, you give t-shirts which have been worn by males for a certain amount of time and let females sniff and males sniff and then you rate the smell in accordance to the reproductive cycle of the females and the [...] of the males and all stuff like that, and you get very interesting results. There's research done at UCL and at the Institute of Zoology in Regent's Park. Yes?

[question] [...]

It is not dramatic, but there is a phenomenon called – let's say, called symmetry – and the more confident you are, the more symmetrical do you look like. And you're unconsciously able to judge people [...] the degree of symmetry they have. There's a very [...] criterion for beauty. The more symmetrical you are means that you are able to fight off the stress which comes from the environment, and of course, if you have scars [...] if you have slight asymmetrical features it means you were not able to defend off the stress as good as somebody who is [...] able to pick out differences which are [...] millimetre, that's like a fifteenth of an inch, and the length of earlobes [...] This is research which is now 3-4 years old and there seems to be a lot of stuff where we judge other people in ways we thought would be impossible to – to judge them.

Well, any further questions? If not, then thanks for your attention.