WILD FATHERS

What Wild Animal Dads Teach Us About Fatherhood

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In memory of Kibabu, the most magnificent
silverback gorilla dad,
and to all the other dedicated animal fathers
I've been privileged to know.

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INTRODUCTION

As a zookeeper in my early career and later a zoo curator I talked a lot about sex. I also watched a lot of it in real time or on a screen, all in aid of my rather unusual job which involved managing global and regional breeding programs for endangered species. I regularly spent time looking at animals courting and mating either in real life or from footage of hidden cameras that taped any overnight action.

Commonly I'd be there with other zoo colleagues dissecting what we could see. 'Did he get it in?' was not a smutty comment but a real question, particularly in the case of a male Sumatran Tiger's mating attempts. We brought him from a German zoo to mate with a female tiger born in Sydney. Both animals were virgins at the time but seemed keen enough to have a go. The problem with the male was that his aim was not particularly good. He kept missing the all-important target. Putting tigers together for mating is a scary undertaking. In the wild, tigers select their own mates, whereas in human care we do this for them. And like any arranged marriage, they may get on well or really hate each other at first sight.

Sumatran Tigers are critically endangered: less than 400 remain in Indonesia, which means there are more of them in the global

breeding program than in their wild habitat. These tigers in zoos around the world are carefully selected for breeding through a managed studbook. The aim is to retain 90 per cent of the genetic diversity found in the wild over a planned breeding program spanning 100 years. Every baby tiger born is designed to have the best possible gene diversity. Right now, we could breed many, many tigers for release in Sumatra but that would only put more pressure on the remaining tigers still there. The problem for Sumatran Tigers is not a lack of tigers but a lack of suitable habitat in which tigers can live and procreate.

Zoos aim to keep genetically priceless tigers reproducing in human care until such time that the release of tigers in Sumatra is possible – either when human population growth slows, or habitat destruction is a thing of the past. These breeding programs exist for numerous endangered species and are known as Insurance Breeding Programs – insurance against extinction in the wild.

The purpose of explaining this upfront is to point out why it is so important to produce the next generation of endangered species from the *right* individual animals. In the case of the Sumatran Tiger, Satu's aimless appendage had us worried. The female, Jumilah, would present her rear end to him and do all the right tiger-seduction things but he would fail time and time again to insert his penis. Jumilah would get cranky – very cranky, even threatening to kill him, and we'd be there with fire extinguishers ready to distract and separate them if things got really nasty. We could quickly open corridors and entice one or the other to the enclosure next door. Luckily, it never got that scary with this pair. Every time they failed to mate, we'd try again the next time Jumilah came into oestrus.

To get a pair of tigers to have sex without killing each other you need to know certain stuff about tigers. This includes:

- how to detect ovulation in the female so you can introduce them to each other at the best time;
- how to read the behaviour of both tigers before you open any doors to put them together in the safest possible way;
- how to best set up the circumstances and environment for a successful mating;
- and knowing that a tiger with a full belly is less likely to get bad-tempered.

At the third attempt, Jumilah fell pregnant and had four cubs who all went on to have their own offspring in other zoos. Satu and Jamilah's story was a common one across many of the species I cared for. I had to research their reproductive behaviour thoroughly. I had to understand how courtship worked, who built the nest, what nesting materials they needed, who sat on the eggs or cared for the young. Breeding bowerbirds, for example, won't work unless the male has all the right gear to build his bower so he can impress a female bowerbird enough so she will allow him to mate with her. I learnt that insects, fish, frogs, reptiles, birds and mammals across thousands and thousands of species all have their own unique and intricate strategies to reproduce. These strategies involve issues like who does what at what time. What is the role of the male and what is the role of the female? And the variations between the species are an endless source of interest.

In a career spanning more than three decades, my research into reproductive strategies of a multitude of species revealed that while

the role of the mother is usually well documented, that of the father is often ignored. Animal fathers of the same species have a basic fatherhood blueprint to which they adhere but in practise some are more dedicated or experienced than others.

In writing this book, I have found my thoughts wandering to my own father. I had two fathers in a way. A Dutch one and an Australian one. The Dutch one was a tall, handsome, rather macho man who ruled the roost during my childhood; a man who felt entitled to whatever he wanted in life without much regard, it seemed, for his wife and offspring. Yet, I always knew he would give his life for me or my sister if the need ever arose. He was a man of his time, expecting and demanding the privileges of being male in the latter half of the last century, when women were meant to know their place. Yet he was also a damaged human being. Emotionally scarred by the Second World War, spending time in the Dutch underground and later in a German concentration camp. How much of his detachment was biology or culture and how much of it brought on by his truly harrowing experiences as a young man, I will never know.

I was fortunate to have another chance at a dad. My husband's father cared for me from the day I arrived in Australia as the new girlfriend of his only son. He was a kind and soft man who was far removed from any displays of machismo. Indeed, he was proud of the fact he did not know how to change a car tyre. In that man I found a loving, involved father who had nurturing qualities I had never experienced in my own dad. He showed a genuine interest in my welfare, gave advice without personal interest, and was supportive and kind. My Aussie dad was a man of his time too: he

had been in the war in New Guinea, although his experiences were not as traumatic as those of my Dutch dad.

Numerous aspects of life influence the way both human and animal fathers parent their progeny, from culture, to the shaping of life experiences and the role model of their own father. Animals of the same species can show their fathering skills in a variety of ways, influenced by their own experiences.

This book is about the role of fathers in the animal world and what we humans can learn from fatherhood in nature. Caring for and raising young is still often seen as a job for mum. The role of the father is frequently stereotyped as little more than an 'egg-fertiliser', or at best a protector and hunter, providing food for his family and not much else. But on the other side of the ledger, there are wild fathers who dedicate a huge part of their life to raise their progeny. Some dads go even further and actually give birth to their young.

The stories in this book draw on natural history, evolutionary biology, philosophy, economics, psychology, anecdotes, observations and the lives of the most extraordinary animal dads with whom we share this planet. By the time you finish reading I hope you will see that there are many awesome, loving and caring animal fathers who deserve much more than their 'sperm-donor' reputation.

I believe that human dads can be inspired by the many and varied ways fatherhood can be achieved and by the diversity of wild fathers in the natural world.

CHAPTER 1

BECOMING A DAD: PASSING ON YOUR GENES

'If you watch animals objectively for any length of time, you're driven to the conclusion that their main aim in life is to pass on their genes to the next generation.'

DAVID ATTENBOROUGH

Becoming a father usually involves sex. We have sex for fun as well as making babies. Humans and Bonobos – another great ape related to us and Chimpanzees – are amongst the few species that are known to have sex for pleasure as well as reproduction. Most animals mate when the female is 'in season', that is she is ovulating and ready to be fertilised. Only then are either gender interested in sex. By contrast, sex among humans is not specifically to make babies but for a multitude of other reasons: it feels good, it creates and maintains bonds between people and it's better than watching television.

The males and females of our species both spend a lot of time thinking and talking about sex. Sex is a biological necessity and

our keen interest in sex is matched in the wild world. In nature, the primary purpose of sex is to make babies, even if the participants don't know this may be the outcome. The reproductive aspect of sex is a significant feature in every species on the planet. We know that all species are driven by a desire to have sex and it is a huge motivator in human societies. Unless a species has a strong sex drive it would become extinct very quickly.

It is surprising then that Western civilisation has made such a big deal about sex being sinful. Lust has been listed as one of the seven deadly sins, along with pride, envy, anger, covetousness, gluttony and sloth. Lust is defined as uncontrolled sexual desire or appetite. Yet without it, humans would cease to exist.

SOME RECORD-HOLDER DADS

Despite our apprehension about sex and the morality of intercourse, some people just get on with it. Historically, some people have done more than their fair share to make sure our human line does not go the way other hominids did before us. The record for the most children produced by one man is reportedly held by Genghis Khan who was born in 1162 on the border between modern-day Siberia and Mongolia. It is claimed Genghis fathered somewhere between 1,000 to 2,000 children. He must have had an extremely vigorous libido to produce this number of offspring before his death at the age of 65. He also had many sons to carry his genetic lineage to the next generation. A study on the genetic legacy of the Mongols published in 2003 found that one in 200 men in the entire world are direct descendants of Genghis Khan. With the advances of DNA, it

Many other animals take to parenthood with commitment and passion as humans do, but in our species this solicitude continues unabated for a couple of decades. We are no different from our wilder cousins in our desire to pass on our genes, to bring up baby safely and to set up a new generation for success.

is now believed that 0.5 per cent of the current world population is a descendent of Genghis Khan himself.

In more recent times, another fatherhood record is supposedly held by King Saud, son of Ibn Saud of Saudi Arabia, who lived from 1902 to 1969. According to one source, Saud had 52 sons and about 54 daughters from 'a wider range of women' than his father who had 22 wives. Yet an alternative source credits him with 115 offspring. It seems that polygamy is a useful strategy for a man who

wishes to add an impressive number of mini-me offspring to the next generation. Polygamy was once a common practise in some human cultures and religions and still is in some places.

Rulon Jeffs, the leader of the Fundamentalist Church of Jesus Christ of Latter-day Saints, at his death in 2002, was reportedly survived by 19 or 20 wives and approximately 80 children. Interesting, but hardly surprising, is that a position of power either in religion, business or inherited status can usually lead to increased access to women for sex. Many cult leaders in modern times have claimed a 'divine' obligation to sleep with all or most of their female congregation, at least the young and good-looking ones. Although less popular in the Western world these days, polygamy continues to find its fans in the sects, cults and some religions around the world.

The urge to reproduce drives all species but some men do take this urge to pass on their genes to extremes. The old-fashioned way to make babies will always be popular but some modern technologies have made it possible to speed up the process without having to provide care beyond conception. Several fertility clinic doctors in the UK, Netherlands and the USA were discovered to have been using their own sperm to impregnate clients. The numerous children of these doctors now have dozens of half siblings and this raises poignant questions about the gene pool. It does show that if the opportunity is there, it is hard for some men to pass up the chance to create an impressive number of progeny.

The strategy of these fertility doctors is reminiscent of members of the cuckoo family (family Cuculidae) in birds. There are more than a hundred species of cuckoos around the world and a great number of these are parasitic breeders. They have all the fun of courtship

and mating and then sneakily lay their eggs in other birds' nests to be looked after by unsuspecting foster parents. The cuckoo chicks will kick out the eggs or hatchlings already there to make room for their superior body-size. The poor foster parents of the changeling are often run ragged trying to raise this huge baby. Birds do seem to suspect there is something dodgy about these adult cuckoos, though, as they are always being chased by other birds.

Apart from fertility doctors using their own sperm, the services provided by fertility clinics are a welcome addition to our modern world. Formal donations to a sperm bank can enhance a man's overall genetic legacy, if so desired. While sperm donation laws vary by country, most have some rules around how many children can result from one donor's contribution, whether the sperm can be used after the donor dies and issues of payment for the donation.

WAYS TO PASS ON SPERM

Sex can broadly be divided into two classes: external fertilisation and internal fertilisation. Animals that live in water do not have the same limitations as those of us who live on land. In water, eggs and sperm don't dry out and sex can be non-penetrative. There are many animals who practice external fertilisation, such as most frogs and fish. Males and females each deposit their reproductive cells into the water and it's up to those cells to find each other. The chances of egg finding sperm are obviously much enhanced when males and females deposit their cells at the same time.

Fishes stimulate each other with mating rituals and when they are in the right mood, she will discharge her roe and he his milt. This

egg and sperm release is called spawning. When fish are spawning, huge congregations of the species gather in an orgy of egg and sperm release. This orgy is designed to increase the chances of fertilisation and the crowd helps to protect the embryos from predation. The offspring produced during these orgies are left to their own devices to survive.

Land mammals have penetrative sex like we do and internal fertilisation occurs. If you are reading this, I assume you're old enough to know how this works. The sperm cells of the male have to enter the body of the female to fertilise the eggs. How this is achieved occurs in many different ways, which we'll discuss in more detail in the next chapters.

When it comes to fertilisation, most bird species fall somewhere in the middle of penetrative and external fertilisation. Male birds tend not to have a penis and they pass on sperm via a 'genital kiss' at the cloaca. The cloaca is a body cavity in birds, reptiles, amphibians, most fish, marsupials and monotremes, into which the intestinal, urinary and genital tracts come together in one external opening. In females it also serves as a depository for sperm. The sperm is internalised by the female bird via this 'cloacal kiss'. Despite this being the more customary avian practice, there is a duck with an amazing penis. The South American Lake Duck *(Oxyura vittata*) has a corkscrew penis measuring nearly 43 centimetres (17 inches) in length which perfectly fits the female's corkscrew vagina. I'm always surprised this duck species is not more widely known for its special 'attributes', but more about it in Chapter 7.

While the way living things reproduce is enormously varied, the creation of new life mostly involves the fertilisation of an egg by a

A good animal father passes on more than his genes to the next generation – he brings up his sons and daughters by example. Human progeny also rely on their special adults to teach them the things they need to know in order to live independently and successfully.

sperm. The fertilised egg produces a new individual, an individual with a mother *and* a father.

QUALITY OR QUANTITY

There are two evolutionary reproductive strategies that trade off quality over quantity of offspring. The 'quantity' approach is used by species which produce a huge number of offspring that did not cost them much in terms of energy or time. They gamble that at least some

will survive and go on to breed themselves. This 'cheap' approach is used by animals and plants that live in unstable environments where things can change quickly. For example, field mice whose homes can transform from flood to drought, or from plenty of food to no food at all, utilise this strategy. At the other end of the spectrum, animals which use the 'quality' approach produce a few 'expensive' offspring with a long gestation and rearing period, in which they have invested a lot of time and effort. These animals tend to live in stable environments. Any reproductive strategy a species evolves has to do with quantity versus quality of offspring. All species are somewhere on the quality over quantity spectrum.

But how much parental care is needed to make sure some offspring will survive to reproduce themselves, thus carrying forward the family genes? Caring for a brood of hundreds or even thousands is usually not an option. Animals who produce vast numbers of young in one go, such as many species of fish, lobsters and butterflies, don't offer much parental care. Those who produce a huge number of offspring don't spend energy in providing for them or defending them against predators. Only a few may survive but that's enough to supply the next generation. At the other extreme are the parents who dote on their offspring for many years. These include humans, elephants, apes and bears. Devoted parents produce few or a single young, often after a long gestation. There's usually a fairly long rearing period, so all in all a significant parental investment in the hope that this next generation will survive to carry their genes forward into the future.

Humans have a substantial gestation time but the longest pregnancy in a mammal is found in African Elephants. They carry

their young for nearly two years (up to 680 days) before giving birth to them. The young are born weighing close to 100 kilograms (220 pounds).

SEXUAL STRATEGIES IN WILD ANIMALS

Our species, like all others on the planet, strives to produce offspring. The urge to reproduce may not be a conscious thought process, but our biology makes us want to have sex and if that sex is unprotected, a baby could be the unintended result.

Getting our genes to survive to the next generation is what we are programmed to do. Evolution has resulted in many variations on that theme and species have adapted ways to achieve this successfully given their unique circumstances and environment. Some of the more common strategies for males to pass on their genetic material are:

- The *wham bam, thank you, ma'am* strategy, whereby the male impregnates a female but that's it. Tigers are a good example of this strategy in mammals. At most, male tigers allow the female to live in their territory, which they then defend against other would-be dads.
- The male impregnates the female and manages the environment but does not help to rear the offspring. This is the strategy employed by zebras.
- The male impregnates his special female and looks after the young. This strategy is exemplified by the tamarins and marmosets.

- The male impregnates the female and together they share all the chores from nest building to incubating eggs and feeding the young. Ninety per cent of birds follow this strategy.
- The male fertilises the eggs, takes care of them and 'gives birth' to the offspring. This is how seahorses and Darwin's frogs go about spreading their genes.
- Finally, there is the strategy employed by some megapodes and ratites, such as the Emu, in which the male looks after the fertilised eggs in exchange for the right to mate. Some birds get the raw end of the deal with this arrangement. Despite his dedication to looking after the nest and eggs, the male Australian Brush-turkey, for example, can't be really sure that the eggs he's looking after are his progeny as the female is not monogamous.

SEX AND UNDERSTANDING THE CONSEQUENCES

The urge to reproduce is so strong that some male birds, like the Australian Brush-turkey, spend a significant proportion of their lives tending a mound that may or may not contain eggs fertilised by him. This begs the question: Do animals understand fatherhood? Or even that sex can make babies? What evidence is there for that? The way some animal fathers care for their progeny with commitment and dedication would make one believe that they feel quite sure the offspring is theirs, suggesting that these fathers know they are investing their time, effort and energy in the survival of their genes. Why would they otherwise spend time caring for youngsters, often to their own detriment? Robert Sapolsky, a noted primatologist,

studied baboons for many years. In his book *Behave: The Biology of Humans at Our Best and Worst,* he states: 'And there are species that figure out relatedness by reasoning; my guess is that male baboons make statistical inferences when identifying their likely offspring: 'How much of his mom's peak oestrus swelling was spent with me? All. Okay, this is my kid; act accordingly."

Jason Buchan and colleagues in an article in *Nature* agree with the premise that male baboons know which offspring they fathered. The Buchan team paternity-tested 75 juveniles in a population of Savanna Baboons and observed who supported whom in disputes. These observations demonstrated that males were significantly more likely to intervene in disputes if they were the dad of the youngster involved.

On the other hand, given that humans did not link sex to making babies for a long time, there could be other explanations about fathers in multi-male/multi-female animal groups. Charles Darwin, the father of evolution, wrote in 1862: '*We do not even in the least know the final cause of sexuality; why new beings should be produced by the union of the two sexual elements. The whole subject is as yet hidden in darkness*'. Humans may not always have known that babies resulted from having sex with the opposite gender. After all, in humans, not all sex leads to pregnancy and there is a long time between the sex act and the birth of a baby. Although there is not a lot of information about what people were thinking hundreds of thousands of years ago, there's some evidence that there may have been an understanding of the link between sex and babies in the Neolithic era. During an archaeological dig in the ancient town of Çatalhöyük in Turkey, a wall decoration depicting a couple

embracing on the left and showing a woman with a child on the right was found. Although humans may have understood the relationship between copulation and childbirth well before, there is little material evidence to support that theory. The Çatalhöyük find however seems to confirm that some 6,000 years ago there was the idea amongst humans that one thing leads to another.

In the late 1960s, indigenous people in Maningrida, northern Australia, interviewed by Annette Hamilton, an anthropology student, linked the sex act to the birth of a baby in a roundabout way. The role of the prospective father was initially described as 'helping the girl get menstruation' through intercourse. Clearing the way so to speak! Menstruation now means the girl is capable of falling pregnant. Most conception stories however involved the presence of spirit children in different locations, such as freshwater pools. Only a woman who wants a child or is already pregnant would go near such a place. The spirit child selects the girl or woman they want for a mother. They enter her directly through her vagina when she is menstruating. The role of the father in this is to dream the spirit child so it can enter the mother. Alternatively, the spirit child can be in a fish or other animal to be eaten by her, often caught by the father. Sex as a reason for pregnancy was alluded to by some of the people Hamilton interviewed. However, there may have been significant cultural reasons her subjects did not talk about copulation specifically to a young female student. The spirit-children stories abound in different parts of Australia as do stories about the stork bringing babies in Europe where I grew up.

In the Basque region of France, shepherds understood conception from their specific knowledge base. In their folklore, the semen

curdles the woman's menstrual blood to form a baby, in a similar way to rennet curdling milk to make cheese. The use of semen to get pregnant is a recurring theme in many cultures far and wide. The Hua of New Guinea also believed that the mix of semen and blood are the building blocks for a foetus and newly pregnant woman ought to have sex a lot so that there is enough material to make a whole baby.

In various ancient cultures the role of the father in conception varies. It is expanded or minimised according to the kind of society and existing gender norms. The people of the Trobriand Islands, an archipelago of coral atolls off the east coast of New Guinea, believe conception occurs when a spirit child enters a woman's womb where it mixes with, you guessed it, menstrual blood. These spirit children were formerly alive but now deceased Trobriand islanders. The lack of involvement by any male in these conception beliefs may reflect that Trobriand society is matrilineal. Descent is from mother to daughter and the social structure is based on matrilineal clans that control land and resources.

In other more male-dominated societies, the role of the mother is diminished. In Malay tradition there was a belief that a baby forms in its father's brain. It then drops to his chest where it is imbued with human emotion. The father then thrusts the tiny baby into its mother's womb. This belief gives a lot of agency to the future dad whilst the mother's role is minimised as a nurturer of the father's creative efforts.

Given the many and varied cultural beliefs around the world about conception, it is not surprising that we do not really know how much our closest relatives, the primates, understand about making

babies. Holly Dunsworth and Anne Buchanan in an article for *Aeon* magazine also write about the concept that primate fathers may recognise the offspring they have sired. They propose that it may be more likely that: 'male baboons, gorillas and chimps might kill infants, but they're less likely to kill ones clinging to females with whom they've mated because sexual relations between primates builds affiliation.' Friendships and relationships are of utmost importance in primates. 'Don't kill your friend's baby' would be a fairly reasonable code of conduct in any social group.

Individuals living in committed, monogamous relationships are most likely the ones to take an active fathering role. An example of this kind is seen in Siamang, a multitasking lesser ape which can swing through the rainforest and care for a baby with great devotion. Siamang dads, which are monogamous, have a lot of certainty about paternity and are therefore perhaps more likely to take a dynamic fathering role. Right now, there may not be solid evidence to suggest that even higher-order animals like primates living in large promiscuous groups would intellectually link sex and baby making. Sex drive is not about making babies. It's more likely to be simply about having sex. Ultimately, the extent of what animals understand about the sex act and it's resulting offspring is not clear. What is clear, though, is that all species go to enormous lengths to find a sexual partner and mate. The urge to have sex is an all-important driver of behaviour in both animals and humans. What is also clear is that some animal fathers will risk their lives to care for and protect their offspring, whereas others never meet the progeny they produce.

HUMAN DADS

No other species has the huge burden of long-term childcare that humans have and yet many line up voluntarily to take on the enormous task. Nearly two decades are dedicated to raising our human progeny, whilst we have the shortest birth interval between babies compared with our related primate species. Our red-haired cousins, the orangutans, have a break between babies that averages some seven years. Gorillas in the wild may give birth every four years, whereas Chimpanzees (*Pan troglodytes*) and Bonobos (*Pan paniscus*) have an interval of some five years. Human babies are born less well developed than those of our hairy relatives and yet we can take as little as 18 months between births. No wonder we need

Like many animal species, human fathers evolved to look after their children, to feed and protect the family unit. How much human fathers do is not as prescribed as it is in other species. Human fathers seem to be the only species that can decide what level of involvement they have with their kids.

fathers for our little humans more than most other creatures, even if fatherhood is more flexible in humans than in any other species.

Paternal involvement in humans ranges from being completely absent to being the primary carer. Some fathers care for their children all day every day for years. Other fathers see their children briefly when they come home at the end of a long day and just before the kids go to bed. Still others have access to their children only on occasional visits once a month or even once a year. Only in humans do we see this huge range of options for fatherly involvement.

The workload for a human raising a kid is greater than for any other species. Mothers evidently go through a lot of trouble with pregnancy, birthing and breastfeeding for a couple of years, but fathers, too, are there for the long-haul, nurturing, protecting, teaching and loving. Many other animals take to parenthood with commitment and passion as humans do, but in our species this solicitude continues unabated for a couple of decades. Despite that, we are not so different from our wilder cousins in our desire to pass on our genes, to bring up baby safely and to set up a new generation for success. Just as in the natural world, a male must consider a range of factors before becoming a father, starting with finding a suitable mate and making sure he is her chosen one.

THE LARGEST SPERM BANK IN THE WORLD

The new Viking invasion! Payment for sperm donations is permitted in Denmark and the Copenhagen sperm bank is close to the city's university, making it easy for male students to earn a little extra pocket-money. This sperm bank is the largest in the world and exports hundreds of litres of sperm to fertility clinics in more than 70 countries, winning Copenhagen the title of sperm capital of the world. So far, this one sperm bank has produced some 30,000 babies at a rate of 2,000 each year. Screening for genetic disorders is commonplace and the donor's health and family history is evaluated.