



# Camel

Robert Irwin



Animal series

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Camel



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# Animal

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Robert Irwin

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Shadows of a caravan of camels cast on the desert sand. Dunhuang, province of Gansu, China.

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# Introduction

'Phoebe, do you believe that your favourite animal says a lot about you?'

'You mean behind my back?'

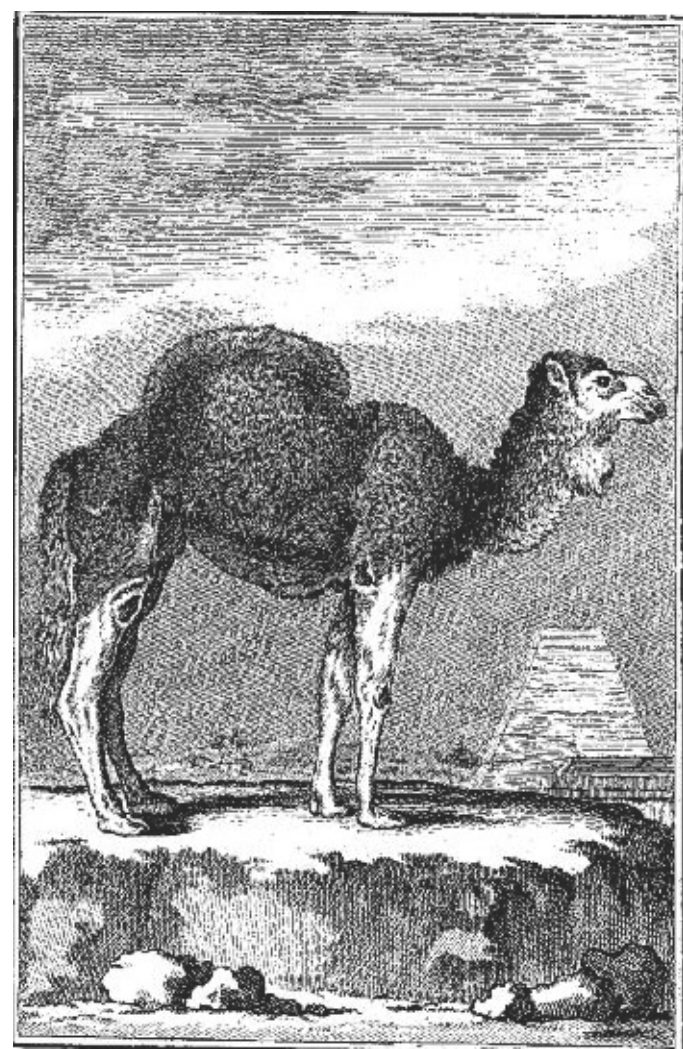
An exchange between Rachel Green and Phoebe Buffay in the us tv series Friends

This is a book about the one-humped and two-humped camel. Throughout the book I shall be referring to the first as 'dromedary' and the second as 'Bactrian'. Purists may object that strictly speaking 'dromedary' should refer only to a racing or pedigree camel. The nineteenth-century desert explorer William Gifford Palgrave tried to sort out the terminological confusion:

The camel and the dromedary in Arabia are the same identical genus and creature, excepting that the dromedary is a high-bred camel, and the camel a low-bred dromedary, exactly the same distinction which exists between a race-horse and a hack; both are horses, but the one of blood, the other not. The dromedary is the race-horse of his species, thin, elegant (or comparatively so), fine haired, light of step, easy of pace, and much more enduring of thirst than the woolly, thick-built, heavy-footed ungainly, and jolting camel. But both and each of them have only one hump.<sup>1</sup>

'Dromedary' derives ultimately from the Greek dromos, meaning 'road', or 'course'. But in practice 'dromedary' is so widely used to refer to any kind of one-humped camel that that particular terminological battle has been lost. As for 'Bactrian', this refers to the region of northern Afghanistan where two-humped camels were once plentiful. (But I do not think that there are any there today.) In order to remember which camel is which, it is helpful to think of the D of dromedary as lying on its side, producing a single hump, while the B of Bactrian on its side produces two humps.





'Le Dromadaire' from the Comte du Buffon's Natural History (1799-1800).

This is my first book in which scientific matters are at issue. I am startled then to find how much contention, vagueness and sheer lack of research bedevils the scientific study of the camel. For example, how many stomachs has a camel got? The fascist camel vet Arnold Leese said three. The HMSO Camel Corps Training Provisional (1913) was firm that there are four stomachs. Jibrail Jabbur, an authority on the way of life of the camel-rearing Bedouin, in refuting the idea that the camel has five stomachs, implied that it had four. The historian Edward Gibbon guessed five. Most modern authorities favour three. Among palaeontologists there is no consensus as to whether camels first appeared in the early, middle or late Eocene era, nor any awareness that variant opinions have been expressed. There are very different estimates about the length of time it takes a dromedary to copulate. Some authorities make the doubtful claim that the dromedary cannot copulate without human assistance. Wildly differing opinions have been expressed as to whether camels can show affection for humans, or whether they are intelligent. There are also quite a few guesses as to when and where camels were first domesticated. I have done my best to pick my way through all this and present what seem to me to be the best guesses.

What is it like to be a camel? How does the camel experience life? Does it take thought for the morrow? What is it like to live in a space that is to a large extent shaped and defined by its smells? How would it be to spend most of one's year

utterly untroubled by thoughts of sex, but then to spend part of the winter violently obsessed with it? What kind of sex life is it in which the smell of urine plays such a large part? How is it that a father can be utterly indifferent to his calf? Why do camels like to spend time with other camels? What makes them responsive to songs and music? What is it in the camel that makes it so readily submissive to human commands? How much of its experience does the camel hold in its memory? Is the camel aware that one day it must die? If so what does it think death is? Do camels wonder what it is like to be human?<sup>2</sup> 'What song the Siren sang, or what name Ulysses assumed when he hid himself among women, though puzzling questions, are not beyond all conjecture,' as Sir Thomas Browne observed. But I fear that the lived experience of the camel is beyond our ability to conjecture. It certainly is beyond mine. As Ludwig Wittgenstein observed, 'If a lion could speak, we would not understand him.'<sup>3</sup> Any careful contemplation of the animal world inevitably raises the unanswerable question, what is it like not to be human? But in the chapters which follow easier questions about the camel will be tackled.

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# 1 Physiology and Psychology

These are the Ships of Arabia: their seas are the deserts. A creature created for burthen. Six hundred weight is his ordinary load; yet he will carry a thousand . . . Four days together he will travel without water; for a necessity fourteen; in his often belching thrusting up a Bladder wherewith he moisteneth his mouth and throat . . . Their pace is slow, and intolerable hard, being withal unsure of foot, were it never so little slippery or uneven. They are not made to amend their paces when weary. A Beast gentle and tractable, but in the time of his Venery: then, as if remembering his former hard usage, he will bite his Keeper, throw him down, and kick him: forty days continuing in that fury, and then returning to his former meekness.

George Sandys, A Relation of a Journey Began An. Dom. 1610

'A camel is a horse designed by a committee' is a remark that has been attributed to the car designer Sir Alec Issigonis (1900–1988). As we shall see, it must have been a remarkably learned committee, well up in anatomy, temperature control, nutrition and desert ecology, among much else. Those committee men would have been designers of real brilliance, for it has been estimated that fourteen per cent of the world's surface is desert and the camel is perfectly adapted to that environment. A horse would swiftly perish in the sort of environment in which the camel thrives.<sup>1</sup>

Camels are artiodactyls (even-toed), of which there are three types – the Suidae, the Ruminantia and the Tylopoda. The Ruminantia ruminate – that is, they regurgitate the food and chew it. In its regurgitated state it is called 'cud'. Cattle, goats, and deer are Ruminantia as they chew cud. Although camels and llamas also ruminate, they are not classed as Ruminantia, but are placed in the sub-order of Tylopoda, distinguished by their padded feet. In prehistoric times there were numerous types of Tylopod, but they have become extinct and the camels and the camelids of South America are the only surviving Tylopods.



Dromedary pulling a load in Rajasthan, India.

Camel bones are dense and hard and sometimes used as a substitute for ivory. The embryos of both the dromedary and the Bactrian have the beginnings of two humps, but in the case of the dromedary these fuse into one during foetal development. (This suggests that the one-humped camel evolved from a two-humped breed.) The Bactrian hump tends to flop, whereas that of the dromedary is firmer. The average height of a dromedary is six feet (183 cm) at shoulder and seven feet (213 cm) at the hump. The Bactrian is shorter, stockier and has shorter legs. The Bactrian has a thick shaggy coat from October to March.

The female dromedary has no mane. The skull is equine shaped. There is quite a lot of disagreement about how much intelligence is contained in that skull. There is also debate about whether camels can form affectionate relations with humans. Some have claimed that camels are not intelligent and, moreover, that they do not bond with men. The nineteenth-century desert explorer William Gifford Palgrave offered an unappealing account of the camel:



The two-humped Bactrian camel.

He is from first to last an undomesticated and savage animal, rendered serviceable by stupidity alone, without much skill on his master's part or any co-operation on his own, save that of extreme passiveness. Neither attachment nor even habit impress him; never tame, though not wide-awake enough to be exactly wild.<sup>2</sup>

Palgrave's indictment fills two closely printed pages.

Again, according to Sir Garnet Wolseley's *The Soldiers' Pocket Book* (1882) the 'camel used in India is a vicious brute'.<sup>3</sup> Also appearing for the prosecution Georg Gerster, author of a book on the Sahara: 'One only has to be present when camel patrol is going off duty. No horseman ever subjected his mount to such a stream of abuse. The curses generated throughout the centuries by the camel's obstinacy, its look of sophistication and its sulky yellow-toothed mouth, from which about a hundredweight of saliva slavers every day, must be as countless as the grains of sand on the great dunes of the Erg.'<sup>4</sup> Someone unkindly described the camel as 'a cross between a snake and a folding bedstead.'

On the other hand, according to H. M. Barker, author of *Camels and the Outback*: 'A camel is one of the nicest creatures there is and yet he is continually persecuted by writers.'<sup>5</sup> Moreover, Robyn Davidson, who trekked across a large part of Australia with a string of camels, claims that the camel is quite intelligent:

They are the most intelligent creatures I know except for dogs and I would give them an IQ rating roughly equivalent to eight-year-old children. They are affectionate, cheeky, playful, witty, yes witty, well-possessed, patient, hard-working and endlessly interesting and charming. They are also very difficult to train, being of an essentially undomestic turn of mind as well as extremely bright and perceptive. This is why they have such a bad reputation. If handled badly they can be quite dangerous and recalcitrant.<sup>6</sup>

The desert explorer Wilfred Thesiger gives the lie to the absurd claim that camels cannot feel affection or loyalty towards humans: 'I can remember another [camel] that was as attached to her master as a dog might have been. At intervals throughout the night she came over, moaning softly, to sniff at him where he lay before going back to graze.'<sup>7</sup> According to Hassanein Bey, the explorer of the Sahara: 'The qualities of a camel are seldom, if ever, appreciated on a slight acquaintance. The camel is as clever as a horse, if not more clever, and in some ways is more human.' A camel, which has suffered injury from a person, 'will bide his time before taking revenge with bites or kicks'. Also, 'the camel can become a very affectionate beast and very devoted to his master.'<sup>8</sup> John Hare, the expert on wild Bactrians, has stated that Bactrians are more intelligent than horses. He quotes one authority on the Chinese Bactrians that they pick up English faster than foreigners do.<sup>9</sup> Camels are sociable creatures and they do not like to travel without the company of other camels.

In general, camels are gentle creatures. But, as Sandys suggested, they are capable of nursing grudges. Pissing and shitting can be used to express dislike. The camels can also spit cud from the first stomach.

As we shall see, male rutting camels can be dangerous. Otherwise camels put up with a great deal without protest, except when they are being loaded. Sir Richard Burton in his *Personal Narrative of a Pilgrimage to Al-Madinah and Meccah* (1893) described the potential difficulties:



We had the usual trouble in loading them: the owners of the animals vociferating about the unconscionable weight, the owners of the goods swearing that a child could carry such a weight, while the beasts taking part with their proprietors, moaned piteously, roared, made vicious attempts to bite, and started up with an agility that threw the half-secured boxes or sacks headlong to the ground.<sup>10</sup>

Opinions differ about the attractive quality or not of the camel's face. Arguably the head raised high and the raised nostrils give it an arrogant appearance. The slack lips suggest stupidity. On the other hand, the soft eyes and the long eyelashes can be seen as appealing. According to Thesiger: 'To Arabs camels are beautiful, and they derive as great a pleasure from looking at a good camel as some Englishmen get from looking at a good horse. There is indeed a tremendous feeling of power, rhythm and grace about these great beasts.'<sup>11</sup>

The eyes, which are large and soft, project downwards so that the camel can see where it is treading. There is a third eyelid which is a defence against blowing sand and which can clear away grains of that sand. The thick bushy eyebrows and double row of eyelashes also assist in this. The camel can see through its lids which are only half opaque. The ears are small and lined with fur in order to filter out desert sand. The nose is similarly adapted to the desert environment. Its slit-shaped nostrils are protected by muscular flaps that can be closed at will. The camel twitches its nose to cool incoming air and to condense the moisture from its outgoing breath.

The lips are mobile, to some extent even prehensile. This reduces the need for the camel to stick out its tongue and thereby lose moisture. There are grooves from each nostril to the mouth. The cleft upper lip absorbs moisture from the nostrils. The lower lip, which is somewhat Hapsburg to start with, sags as a camel ages. The camel has a dula, or soft palate, technically known as a palatine verticulum. (Dula, or more correctly dul'a, derives from the Arabic verb dala'a, meaning 'to stick out one's tongue'.) The dula is often protruded from the mouth by the rutting male. Robyn Davidson describes it as 'a hideously repulsive pink, purple and green balloon, covered in slobber and smelling indescribably foul, that female camel

perversely find attractive'.<sup>12</sup> The tongue is small and mobile. A fully grown camel has thirty-four teeth. The canine teeth of the male are longer than those of the female. The front teeth are razor sharp. The teeth of the camel grow throughout its life, so it needs tough branches or similar hard material to chew on in order to abrade them and prevent them from getting excessively long. The inner surface of the mouth is tough enough to allow the eating of thorny plants. The neck is long in order to assist it in grazing off trees or tall bushes.

Camels like to spend eight to ten hours in grazing. They tend to move around a lot while doing so and this has the effect of increasing variety in their diet, as well as doing less ecological damage to the plant life of the region. Food is gulped down and regurgitated and digested later. Camels need a lot of salt and this they usually get by eating certain sorts of bushes. Acacia is good for the camel's diet because of the plant's high water and salt content. Camels can comfortably subsist on the camel-thorn, salt bush and acacia that other animals will not touch. In that sense they have an ecological niche. (However, a diet of camel-thorn gives rise to intense halitosis.) They like eating dates and they have no problem digesting the date stones. They will also eat locusts. According to Reuven Yagil, the camel, unlike true ruminants, does not have a properly developed third stomach.<sup>13</sup> However, its stomach is generally reckoned to have three compartments.

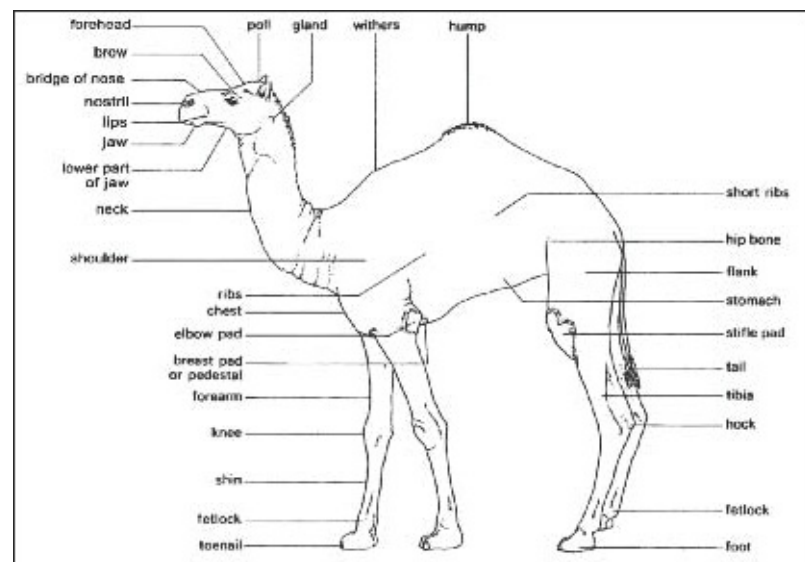


Elijah Walton, Head of a Camel, 1864, chalk drawing.

The first stomach compartment corresponds to the rumen of the true ruminant and it is where food is stored and where bacteria can break down the cellulose in hard grasses. So the stuff becomes cud to be chewed over more thoroughly later. The other two stomachs contain bacteria that will break down the chewed-over stuff yet more thoroughly and distribute it throughout the body. Water is not stored in the stomachs in any significant quantity, despite claims that desperate men in the desert have slit open the stomachs of camels in order to drink the fluids they contain. In summer camels ruminate at midday and during the night. The

stomachs' contents are recycled rapidly compared with true ruminants. Little protein intake is required. Camels can be quite eclectic in what they eat. One of Georg Gerster's camels 'developed an unbridled passion for shoe-soles, whether of rubber or of leather and regardless of the nails. I do not know which astonished me more, the apparent abundance of discarded shoe soles in the desert or the camel's acquired taste for the dilapidated handiwork of some oasis shoemaker.'<sup>14</sup> In Australia, a '1962 post-mortem on a half-grown camel near Oonadatta that had died suddenly revealed that its stomach contained a large plastic sheet and a length of copper wire.'<sup>15</sup>

A dehydrated camel can drink 27 gallons in ten minutes. Any other creature would die of overhydration if it attempted to drink so much, but uniquely the camel can store vast quantities of water in its bloodstream. It has oval-shaped non-nucleated blood cells which resist osmotic variation without rupturing, so the cells can swell to twice their initial volume. Camel's blood is similar to that of reptiles. It also contains a large quantity of albumin (a kind of protein). Albumin helps the camel conserve water by increasing the osmotic pressure which keeps fluid in vascular spaces. The camel, like many creatures, drinks rapidly, and waterholes in the wild have tended to be dangerous places to linger at. The camel drinks to satisfy thirst, but it does not drink to store up water in advance. It can drink water with a higher salt content than seawater. It can go thirty days without water, as long as there is decent grazing, and it can go five to seven days without either food or water. In the case of very prolonged deprivation of water, the camel's mouth becomes so dry that it finds it difficult to eat.

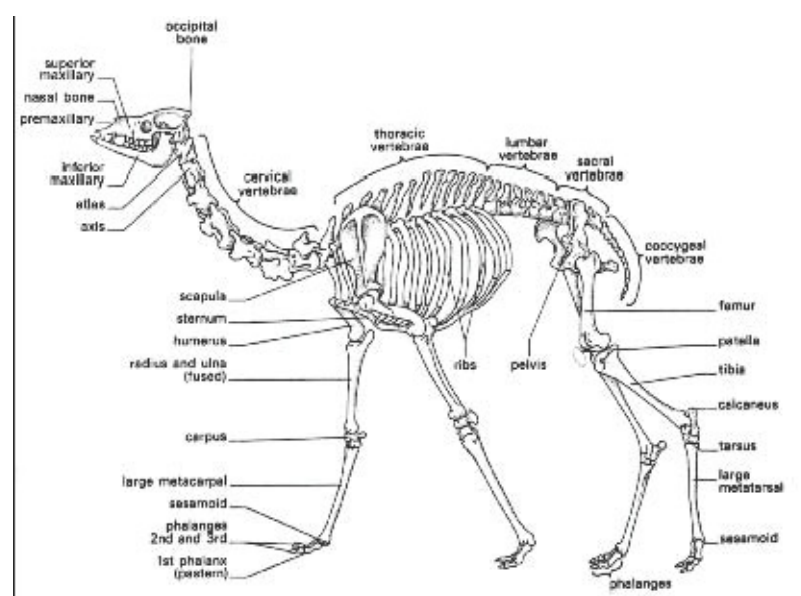


A morphological sketch of the camel.

Camel dung is rich in ammonia and therefore good as a fertilizer. The pellets are dry, neat and round. In a healthy camel the balls of shit will be as round as apples. The dry pellets are good for fires. Hence, as H.R.P. Dickson, British Political agent in Kuwait in the 1930s, observed, 'all travellers carry a bag full'.<sup>16</sup> The pellets shrink if the camel is dehydrated. The camel has a small bladder and it urinates in small



dribbles as it walks. The urine is thick, salty and syrupy. It is also quite hot and on cold mornings Bedouin sometimes warm their hands in it. A dehydrated camel urinates less than a man. The male camel is retromingent, that is to say that it urinates backwards. (According to Arab folklore this is done out of respect for Abraham.) More plausibly, the dribble of urine cools the male camel's back legs. However, when the camel is sexually aroused, its penis reverses direction. The Victorian desert explorer Charles Doughty describes the camel's smell as 'musky' and a little dog-like, the hinder parts being crusted with urine; yet the camel is more beautiful in our eyes, because man sees in this creature his whole welfare.'



The camel's skeleton.

The camel loses water from bodily tissues, not from the blood, and therefore there is no strain on the heart. The sweat gland is at the back of the neck. A human sweats as soon as temperature rises above the normal body temperature of 37 degrees, but the camel can raise its tolerance up by as much as six degrees before it begins to sweat. It is unique among mammals in this. In the spring camels moult and they acquire a new coat in the autumn. The coat reflects sunlight. Bactrian camels have two coats, a warm inner coat of down, and an outer coat which is long and hairy. Because of the hairy coat, sweat evaporates close to the skin and this helps the camel stay cool.

The humps do not store water. Fat is stored there, as an energy source. If fat were distributed throughout the body, rather than concentrated in the hump(s), it would make the camel too hot. When fatty tissue is metabolized, it produces water through reaction with oxygen. Although a fat hump is usually a sign of good health, it could just be that the camel has been eating a lot of plants that have a high water content. Apart from storing fat that can be transformed into energy, the camel's hump acts as a kind of umbrella that protects the internal organs from excessive heat. The dromedary has a single hump, rather than two, probably because that way less of the animal's surface area is exposed to heat.



A camel skeleton in Palestine, bones stripped by locusts, c. 1936.

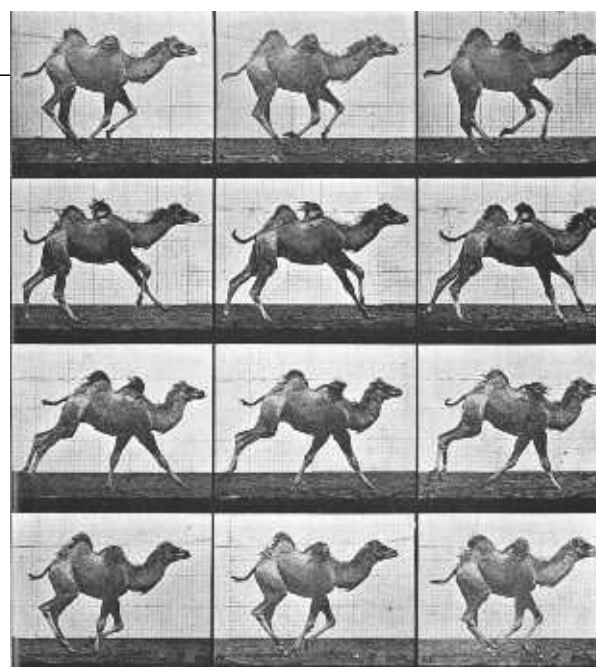
Long legs keep the standing camel well above the hot sand. (The Bactrian, which mostly inhabits colder climates, has shorter legs.) The front legs are stronger and carry most of the camel's weight, and this is part of the reason for the swaying motion. Unlike the horse's legs, the camel's legs only connect with the body at the top of the thigh.

The camel paces – that is to say, it moves both the legs on the one side and then both on the left. This is conducive to the rolling gait. It is the only species to pace normally, though a horse can be trained to do so.

In his stylish classic of travel writing, Eothen, Alexander Kinglake described the effect of pacing on the rider:

The camel, like the elephant, is one of the old fashioned sort of animals that walk upon the (now mostly exploded) plan of ancient beasts that lived before the flood; she moves forward both her near legs at the same time, and then awkwardly swings round her off-shoulder and haunch, so as to repeat the manoeuvre on that side; her pace therefore is an odd disjointed and disjoining sort of movement that is rather disagreeable at first, but you soon get used to it.<sup>18</sup>

As noted, the camels are Tylopods, or pad-footed. But unlike most ungulates they have nails rather than hooves. The camel's nails are small. The camel does not walk upon its nails, but upon pads in front of its hooves. These leathery pads spread out when it walks. (The smaller mountain dromedary has a harder foot.) Inside the pad is a squishy sort of bladder. Because of the soft pad, the camel has a silent tread. If it walks on hard stony ground for a long time, the pads may crack and the camel will then need to wear special leather shoes. Alternatively, the damage can be treated with tar and turpentine. When the camel kicks, it kicks sideways. At a normal pace the camel covers three miles an hour. At a gallop it can do twelve, or even fourteen miles an hour. A dromedary can comfortably carry a load of six hundred pounds (273 kg), whereas the stockier Bactrian can carry over a thousand pounds (455 kg).



Consecutive mechanically triggered images of a camel running, from Eadweard Muybridge's 1887 book *Animal Locomotion*.

There is a Pushtu proverb to the effect that 'God alone knows on what knee the camel will squat down', but it is not as bad as all that. Still, watching a camel kneel is quite a sight. This is T. E. Lawrence's description:



Close-up of a camel's foot.

They knelt without a noise, and I timed it in my memory: first the hesitation, as the camels looking down felt the soil with one foot for a soft place: then the muffled thud and the sudden loosening of breath as they dropped on their foreleg, since this party had come far and their camels were tired: the shuffle as the hind legs were folded in, and the rocking as they tossed from side to side thrusting outward with their knees to bury them in the cooler subsoil below the burning flints.

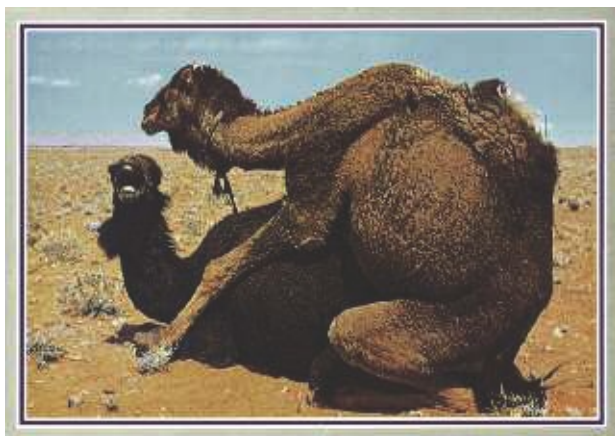
The camels would rest there, uneasily switching their tails till their masters remembered and looked to them.<sup>19</sup>

When settling down, the camel will seek out the softest spot. The brisket, also known as the chest callus, is an area of hard gristle (a keratin pad) for the camel to

rest the main weight of its body on. The knees also have calluses. Camels often rest against one another to stay cool. In the daytime, they usually sit facing the sun so as to minimize the exposure of their bodies to the sun's rays. Heat from the day that has accumulated in the body is lost in the cool of the night. There are selected spots in the desert where the camels like to roll in the soft sand. These sites of dust baths are identified by sniffing. Sometimes there are communal sites where lots of camels will roll together. The main purpose of such rolling seems to be to dislodge ticks, though it perhaps also relaxes the muscles. Occasionally, a female camel will roll on the ground as part of a courtship display.

There is no sexual interest in the summer and it is therefore safe to let males graze with females at that time. The male becomes sexually mature at six. His right testicle is slightly larger than the left. (Not many people know this.) It is common practice to castrate most male camels in order to prevent fights and aggressive rutting behaviour. Just a few stallions are spared for breeding. The camel's rutting is comparable to the musth of the Asiatic elephant. A rutting camel is known in Arabic as the hadur, or braying one. A sticky, smelly substance is secreted behind the ears when rutting. A male in rut is too agitated to eat much and his condition declines. Herders often give special food to the rutting male in order to make good the weight loss. He froths, gargles, grinds his teeth and is prone to violence. He urinates and uses his tail to swish his piss about. All this spitting, drooling and urinating - wastage of water - can be seen as a form of conspicuous display intended to impress the female - the male camel's equivalent of the peacock's tail. There are occasional fights between rutting males for ascendancy. As noted, the blowing out of the soft palate (dula) seems to impress the female no end. Its smell is attractive to her. (The Bactrian, however, does not have this mouth flap.) For his part, the male sniffs at female genitalia and he is roused by the smell of the urine of a non-pregnant camel.

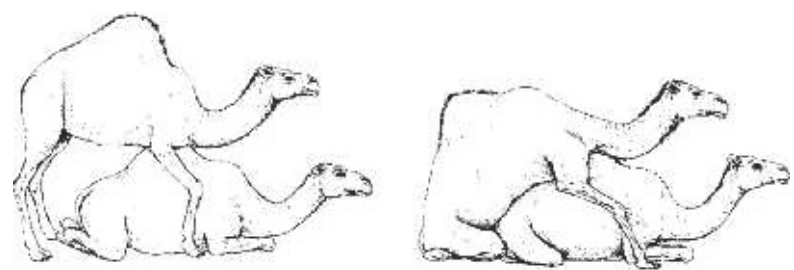
The female dromedary needs ovulation to be stimulated by mating. In the northern hemisphere copulation mainly takes place between November and February. The female wags her tail at the approach of the male and displays her genitalia. Often, when she is ready for sex, she sits down spreading her hind legs and urinates. But if she is reluctant, the male may put pressure on her neck to force her to sit down. Bertram Thomas, the explorer of Arabia's Empty Quarter, has a footnote on copulating camels:



Camels copulating, from a picture postcard.

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Camels are thus, like the llama and the lion, rare in the animal kingdom in the performance of the act in the sitting position. The Badu master is necessary to the operation, scooping the sands round the cow's legs for her comfort, inserting the penis - the formation of which is in reverse axis to nearly all the rest of mammal creation, and interfering after a few minutes to drive the bull off. After ten days if no result is apparent, the cow's master will find another bull to serve her. The sign of pregnancy is the flag-wagging of her ridiculous tail when approached by a rider to mount.<sup>20</sup>



The two stages of camel copulation.

Average copulation time is five and a half minutes (but one authority says around twenty minutes!).<sup>21</sup> His penis is hook-shaped. Sometimes men assist the copulation - for example by tying the female's foreleg to her shoulder. But obviously human assistance is not absolutely necessary, otherwise there would not be wild camels and feral camels. A male can serve fifty or more females.

Cross-breeding between camelids is possible and in Persian a hybrid from Bactrian and a dromedary is called a bokt. It has a single hump that is longer than the dromedary's hump. The bokt is big and strong and a good pack animal. A camel is the product of the mating of a camel and a lama.<sup>22</sup>

The female first calves at the age of five. It is very rare for twins to be born. Camel mortality is high: between twenty and forty per cent die in the first year. When about to calve the female has a tendency to wander away. Charles Doughty described the parturition in his peculiarly elaborate and archaic prose:

The yearning camel-cow, lying upon her side, is delivered without voice, the fallen calf is big as a grown man; the herdsman stretches out its legs, with all his might: and draws the calf, as dead before the dam. She smells to her young, rises and stands upon her feet to lick it over. With a great clap of the man's palm upon that horny sole, zôra (which, like a pillar, Nature has set under the camel's breast to bear up the huge neck), the calf revives: at three hours end, yet feeble and tottering, and after many falls, it is able to stand reaching up the long neck and feeling for the mother's teat. The next morrow this new born camel will follow to the field with the dam.<sup>23</sup>

Female camels are often sterile and they often abort, sometimes owing to parasitic infections, so it can be difficult to keep up the numbers in a herd. The gestation period of a dromedary is a little over twelve months and that of a Bactrian can be a month or more longer. Calves are suckled for three or four months. The she-camel will mother a calf for a whole year. At the end of a year the calf is weaned. The milk is low in fat and high in vitamin C, but it does not store well.



A Bactrian camel suckling her calf.

The camel has four teats. (The Bedouin customarily tie up two of them so that they can keep some milk for themselves.) The sweetest milk comes from camels that have most recently given birth, but camel milk has no cream. It is available for eleven or more months a year - unlike sheep, goats or cows, which only lactate for five months. The female mourns when her calves are taken away and will weep and mourn for a dead calf for about ten days. A baww is the term for a stuffed calf assembled by Arab herdsmen to ease the grief of a mother camel.

A calf can usually stagger upright in half an hour. It remains close to its mother for the first five years. Females reach puberty in the second year and start bearing calves in the sixth year. Up to the age of three a camel needs some sleep. Thereafter some claim that it does not sleep, but there is some dispute about this and the staff of Whipsnade Zoo are emphatic that camels do sleep (heads down, eyes closed, etc.). In the ninth year, with the appearance of canines, the camel's growth is complete. It has a life expectancy of about forty years.

It is possible that in navigating male camels follow the stars. The lead camel or female urinates every six kilometres or so to mark the way for those that follow.

Almost all the world's camels are either domesticated or feral (feral camels being the descendants of domesticated camels that have escaped or been turned loose). Exceptionally, there are some hundreds of wild Bactrian camels in Mongolia and China. It seems that the wild Bactrian may belong to a different species from the domesticated Bactrian.

The wild Bactrian is greyer and slimmer and has smaller, more widely spaced conical humps. It has a thinner head, shorter hair and a different DNA, in that it has three more genes than the domesticated Bactrian. Also it has no chest callus and

unlike the domesticated Bactrian, the wild Bactrian can drink saltwater slush. It is conceivable that the wild Bactrian is the ancestor of the domesticated camel worldwide.<sup>24</sup>

Camels have a taste for music. In 1911, in an article entitled 'Les Animaux – sont-ils mélomanes?', the magazine *Nos Loisirs* reported on an experiment carried out in the Bronx Zoo, New York, when a naturalist took a gramophone round the zoo and played music to various animals. Although quite a few of the animals were indifferent or even hostile, the llama stood rigid to attention to hear the music. The camel was equally delighted and tried to get its muzzle into the antique gramophone's horn and rubbed its face against it. But for many centuries before the invention of the gramophone, Bedouin have sung to camels to urge them on or to get them to drink.<sup>25</sup> A singing hadi, or camel driver, can get camels to move faster if he sings well. According to the fourteenth-century historian Ibn Khaldun, there were teachers in Egypt who specialized in teaching alhida, the camel driver's chant.<sup>26</sup> In medieval Persian poetry lovers were often compared to camels which bear their burdens patiently and hurry to their master's voice or flute. Camels identify their master by his songs. In the sixteenth century, Leo Africanus, in his account of the camel, mentioned the songs that are used to encourage the camel. He also described a dancing camel in Cairo. Rosita Forbes, an adventuress who travelled in the Libyan Sahara in the 1920s, remarked that 'it is a curious fact that camels walk more quickly and straighter to the sound of singing. Therefore the blacks and She-ibs drivers used to chant wild melodies of love and prowess to even my great blond beast forgot his amorous gurglings and kept his nose in a bee-line for the horizon.'<sup>27</sup> Mongol herdsmen make use of a mouth harp in order to get a female camel first to weep and then to accept to suckle a calf which is new to hers. A variant of this procedure was filmed for *The Story of the Weeping Camel* (on which see chapter 6). Hassanein Bey gave several examples of the song that the Saharan nomads sing to their camels, of which this is one:



A camel listening to an old-fashioned horn record player, from the French magazine *Nos Loisirs*.

The sand-dunes hide many wells  
That brim with waters unfailing.  
You come to their margins like bracelets

Camelids have a special immune system which gives them more resistance to certain diseases than other ruminants or, for that matter, humans. However, they are peculiarly vulnerable to camel pox and trypanosomiasis. Camel pox is a viral skin disease. Lesions usually appear on the head. Young camels are most vulnerable to it and most likely to die from it. More normally though, the disease runs its course in a matter of weeks. In trypanosomiasis, also known as surra, flying and biting insects, especially tsetse flies, are responsible for infecting the blood with a parasite. This gives rise to fever, anaemia and emaciation. If untreated, it results in ninety per cent mortality. The symptoms include recurrent fevers, progressive anaemia and general physical decline. Initially at least, the disease is tricky to diagnose. It is a summer disease and horses and mules are also vulnerable to it. Mange, an inflammation of the skin (in Arabic, jarrab), is caused by gastrointestinal worms and is potentially lethal. It can kill a camel in a matter of weeks. It usually arises out of lack of fresh grass and it steadily weakens a camel. After trypanosomiasis, it is the biggest single camel-killer.<sup>29</sup> T. E. Lawrence describes how the tribesmen he was with tried to treat it by rubbing the camel's coat with butter.

Some camels get afflicted with the mysterious bent-neck syndrome in which the camel is hardly able to lift his head above the ground. Rabies is fairly rare, but it does occur and it is lethal. Tuberculosis is rare, but camels can catch it from cattle. Sedentary camels are particularly prone to ticks. Lawrence described how humans too could be plagued by these creatures:

The camel-ticks which with blood from our tethered camels had drunk themselves into tight slaty-blue cushions, as thick as a bean, and as large as a thumbnail, used to creep under us for warmth, hugging the animal-like leather underside of the sheepskins: and if we rolled on them in the night (for men sleeping on the flat lay at first usually for softness on their faces) our weight would burst them into brown mats of dry blood and dust.<sup>30</sup>



A camel tick.



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