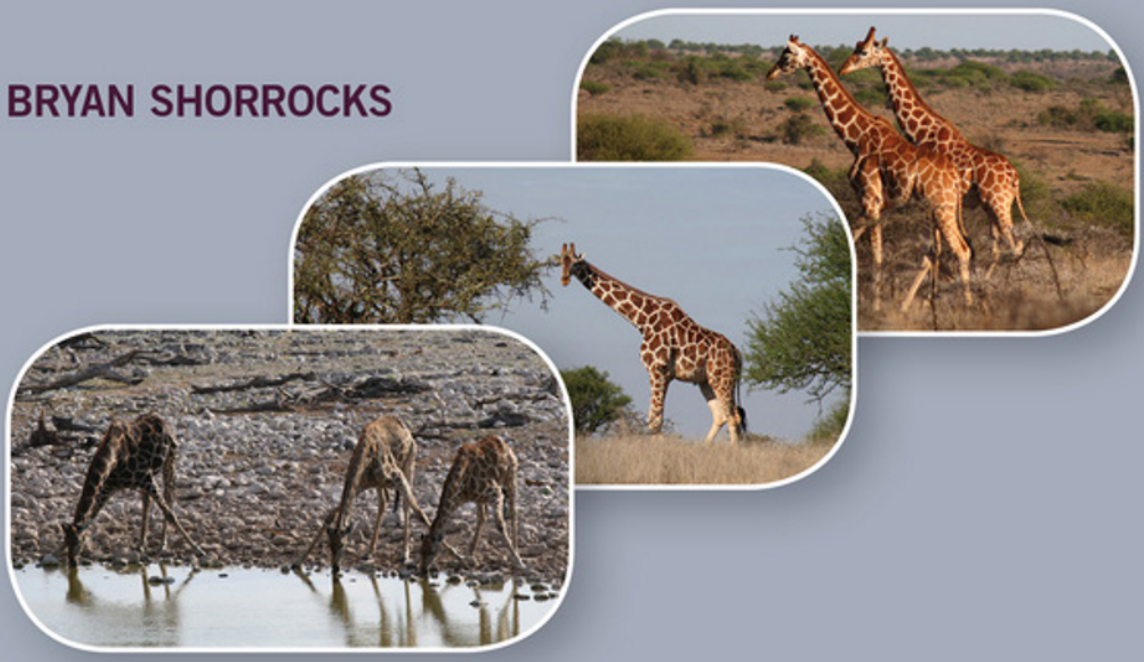
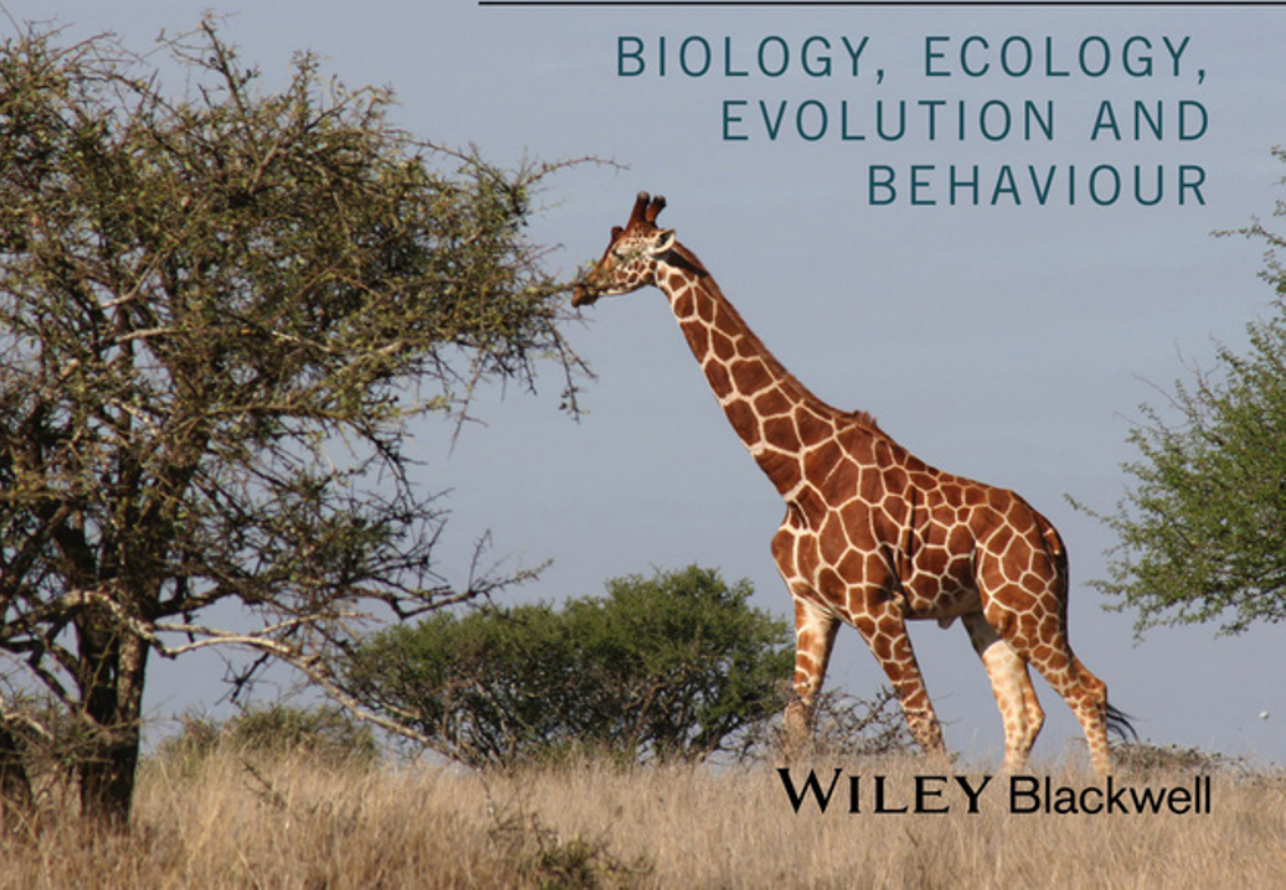
BRYAN SHORROCKS



THE GIRAFFE

BIOLOGY, ECOLOGY, EVOLUTION AND BEHAVIOUR



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The Giraffe

The Giraffe

Biology, ecology, evolution and behaviour

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WILEY Blackwell

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Preface

Robert H. MacArthur was an American ecologist at Princeton University who, in the 1960s and early 1970s, made a major impact on many areas of community and population ecology. His emphasis on hypothesis testing helped change ecology from a primarily descriptive field into an experimental field, and drove the development of theoretical ecology. When he wrote his final book, *Geographical Ecology* (1972), he began the introduction with these words:

> *To do science is to search for repeated patterns, not simply to accumulate facts.*

This present book is about the giraffe, but I hope it is not simply a collection of facts. Of course, there are many facts about giraffes in the book, but I have also attempted to look for patterns. And sometimes this has involved reanalysing older data and using data from other species. There are two main reasons for the latter. First, some areas of giraffe biology are poorly documented. Therefore looking at other African browsers, or even other ungulates, might provide an insight into what giraffes are doing, and suggest research areas that require more attention. Second, even if we have the data for giraffes, it is essential to examine what other African browsers/ungulates are doing in order to see if there is in fact a general pattern.

Many enthusiasts who write about giraffes frequently say that this 'piece of biology is unique to the giraffe'. But here lies a danger. If we only look at giraffes and see everything they do as unique to them, then we will always search for answers by looking only at giraffes. For example, giraffes are frequently said to have a unique fast gait in which the legs on the same side of the body move forward together. The 'unique' is not true. This type of gait is called a pacing gait and, it should be stressed, is not unique to the giraffe, being found in the okapi (*Okapia johnstoni*), camel (*Camelus dromedarius*), llama (*Lama glama*), topi (*Damaliscus lunatus jimela*), kongoni (*Alcephalus buselaphus*), wildebeest (*Connochaetes taurinus*), hyaena (*Crocuta crocuta*) and some canids, all with sloping backs. Look for patterns first, and then within these general patterns look again at giraffes and how they might differ.

Of course, patterns can be misinterpreted, particularly if several quite different causes can produce the same pattern. Researchers must consider all options as an explanation and try and eliminate those for which evidence is lacking. Naturally, conservationists are frequently involved in non-scientific discussions, often involving local 'feelings' about animals and their livestock and crops, but when collecting data and drawing conclusions they must always use the 'tried and tested' protocols of the scientific method.

I would like to thank several people who have provided permissions, thoughts, photographs and encouragement for my work on giraffes. These include: Fred Bercovitch, Rachel Brand, Kerryn Carter, Mike Chase, Isobelle Ciofolo, John Doherty, Jack Lennon, Zoe Muller, Mordecai Ogada, Russell Seymour and Robert Sutcliffe. In addition, I thank Dan Rubenstein for discussions, at the Mpala Research Centre in Kenya, on his zebra stripe patterns that gave me the idea for the giraffe codes in Chapter 8. I thank Roger Butlin for discussions about species and DNA, and I thank Craig Hilton-Taylor, Head of the IUCN Red List Unit, for permission to quote extensively from IUCN publications and their website. I thank Darren Croft for introducing me to 'social

networking ideas' and to Paul Ward for reintroducing me to Africa. Finally, I thank the staff at the Mpala Research Centre in Laikipia, Kenya, and Etosha National Park, Namibia, for all their kind help during my stays there.

Most of my work has been centred in Kenya, where I also took MSc students for many years. I thank all the staff and drivers at Concorde Safaris, in Nairobi, for being so helpful during over 20 years of visits to their country, and providing me with vehicles. I thank the Kenyan Ministry of Education, Science and Technology for providing me with research permits.

Bryan Shorrocks
January 2016

CHAPTER 1
Introduction to the giraffe

In the prehistoric rocky landscape of the Sahara, native people drew pictures of this amazing animal, and in the Egyptian Bronze Age it decorated the tombs of kings. It may even have been the god the Egyptians called 'Set' (Spinage 1968a). In ancient Greece and Rome it was called the 'camelopard', in East Africa today it is *twiga*, and in the English language we now call it 'giraffe'. The name 'giraffe' has its earliest known origins in the Arabic word *zarafa* (*zarāfah*) (زرافة), perhaps from some African language. The name can be translated as 'fast walker' (Kingdon 1997), although some linguistic authorities believe it stems from a source meaning an 'assemblage of animals'. Clearly, the Greeks took this latter view. They contributed part of its scientific name, *camelopardalis*, which literally describes a camel's body wearing a leopard's coat. The Italian form *giraffa* arose in the 1590s and the modern English form developed around 1600 from the French *girafe*. The old and the new now combine to form the giraffe's scientific name, *Giraffa camelopardalis*, although interestingly, the form 'kameelperd' survives in Afrikaan.

In one form or another, giraffes have been around for a very long time. And so has *Homo sapiens*. The interaction between giraffes and humans starts way back in prehistory, and rock art (paintings and engravings) is found all over Africa from Morocco, Algeria and Libya in the north, through Ethiopia, Somalia, Kenya and Tanzania in the east, to Botswana, Zimbabwe, Namibia and Mozambique in the south (Le Quellec 1993, 2004; Muzzolini 1995). Wherever, in fact, there has been savannah. However, the most extensive and remarkable rock art is found in areas of the Sahara (Coulson & Campbell 2001). Today these are found in remote, inhospitable regions of the desert, so arid that any form of sustained human or animal existence is untenable today. They document prehistoric cultures that apparently thrived in these regions, hunting wild animals and herding domesticated cattle, that have subsequently vanished, leaving little trace of their presence or of the richness of their cultures.

The Sahara has not always been the desert it is today. Over the last 2 million years, it has fluctuated several times between even greater aridity and plentiful rain. Where there are now dry gullies, rivers once flowed. In what are now empty sandy plains, there were lakes surrounded by grasslands and trees, rather like the savannahs of sub-Saharan Africa today. The earliest rock art, much of which represents large wild animals such as giraffe, hippo, elephant, rhinoceros and the extinct long-horned buffalo (*Buffalus antiquus*), is believed to have been created by hunter-gatherers more than 7000 years ago and possibly as early as 10,000 BP (before present).

The Wadi al-Hayat is one of three wadis (dry rivers where the underground water is near enough to the surface to support vegetation and to be accessed through wells) in the modern

The Giraffe: Biology, Ecology, Evolution and Behaviour, First Edition. Bryan Shorrocks.

region of the Fezzan, situated in south-west Libya. Since about 7000 years ago, possibly earlier, human groups living in the wadi, or perhaps using it periodically, were creating rock engravings of the animals found in their savannah environment. These animals seem to have been chosen deliberately, and presumably had great cultural value and meaning. Precisely what they symbolised to these Stone Age people, and the message that they conveyed, is of course not known for certain. However, they may have been created to give early hunters mastery over their prey. Of course, these early hunters may well have just enjoyed painting and engraving the animals they saw around them. What is noticeable in these prehistoric depictions of, for example, giraffes is the artists' familiarity with their subject. They knew these animals, their graceful bodies and how they moved. In contrast, later medieval depictions are a poor reflection of the real animal, presumably because the artists had never seen a giraffe.

Fig. 1.1 Line drawing of rock art from the Fezzan, Libya. Notice the leash around the neck of one of the giraffes.

The first significant collection of prehistoric and historic engravings was identified in the Wadi al-Hayat in 2000 and 2002, during the Fazzan Archaeological Project, directed by Professor David Mattingly. These preliminary studies indicated that this was an exciting area to explore further (Mattingley 2003), and after a systematic survey of over 80 km of the wadi, over 900 engraved rocks and several thousand individual carved images have been recorded. Interestingly, many of the paintings and engravings of giraffe show what appear to be human hunters, nets (often called plate nets) and ropes attached to neck collars (Fig. 1.1). Other sites in Libya include Wadi Methkandoush and Karkur-Talh which have pictures of elephants, hippos, giraffes, cattle, crocodiles and birds. In Karkur-Talh, the only large African animal represented is the giraffe. The absence of elephants and rhinoceros seems to indicate that these engravings are younger than the earliest ones in the central Saharan massifs. Most of the engravings are small, 30–50 cm; there is a single example of a giraffe exceeding 1 metre in dimension. Frequently the animals (giraffe and ostrich) are shown tethered, probably caught in some kind of a trap, or held at the neck by a leash.

In the heart of the Sahara, in what is now Niger, lies the Tenere Desert. Tenere means 'where there is nothing'. It is a barren desert landscape stretching for thousands of miles, but this part of the Sahara lay across an ancient caravan route. For over two millennia the Tuareg operated this trans-Saharan caravan trade route, connecting the great cities on the southern edge of the Sahara, via five desert trade routes, to the northern coast of Africa. Here in the heart of Niger lies Dabous, home to one of the finest examples of ancient rock art in the world, two life-size giraffes carved in stone, possibly at least 8000 years old (Dupuy 1988). They adorn an outcrop of rock and, curiously, the carvings cannot be seen from the ground, but only by climbing onto the outcrop. What is also interesting is that the rock surface used, the stone canvas if you like, had been prepared beforehand for the carvings. There are two giraffes, one large male in front of a smaller female, engraved side by side on the sandstone's surface. The larger of the two is over 18 feet tall (5.40 m), combining several techniques including

Fig. 1.2 The Niger giraffes. Reproduced by kind permission of Rudy A. Photography: www.rudyaphotography.com/.

scraping, smoothing and deep engraving of the outlines (Fig. 1.2). This giraffe has a leash on its neck, perhaps implying some level of taming the animals.

Whatever the reasons for these prehistoric depictions of giraffes, what is certain is that they have had a significant place in these African prehistoric cultures for thousands of years, perhaps even being kept as 'pets' or 'status symbols'. Yet despite this, giraffes are hardly mentioned in African folklore today. Only the Tugen (Kamasia) tribe of Kenya retains the giraffe's image in the face of their god Mda (Spinage 1968a). Intriguingly, the Tugen are a Kalenjin people and they believe that although their ancestors' aboriginal home was in Kenya, they migrated to Misiri or Egypt, where they stayed for thousands of years, and then migrated back again to Kenya. It is to Egypt that we now turn for images of giraffe.

The early Egyptians used images and symbols of giraffes quite frequently. In predynastic times (before about 3050 BC), the Egyptian climate was much less arid than it is today. Large regions of Egypt were covered in savannah and would have been home to herds of grazing ungulates, including giraffes. In southern Egypt, the Naqada culture began to expand along the Nile by about 4000 BC and manufactured a diverse selection of material goods, which included combs. Figure 1.3 shows an early ivory comb, ca.3900–3500 BC, what is called the Naqada I and early Naqada ll periods, with the handle of the comb depicted as a giraffe. More detailed is the giraffe on a carved schist palette, again from Naqada (Fig. 1.4). These cosmetic palettes, of middle to late predynastic Egypt, were thought to have been used to grind and apply ingredients for facial or body cosmetics. Later they became commemorative, ornamental and possibly ceremonial. Many of

Fig. 1.3 Ivory giraffe comb from Naqada graves. Ashmolean Museum, Oxford. Photograph by Jo Shorrocks.

the palettes (like Fig. 1.4) were found at Hierakonpolis, a centre of power in predynastic Upper Egypt. After the gradual unification of the country (from around 3100 BC), the palettes ceased to be included in tomb assemblages.

We next see giraffes in hunting scenes from the pyramid complex of King Unas (2375–2345 BC), at Saqqara. Unas was the last of the kings of the Fifth Dynasty. A covered causeway (720 m long) links Unas's mortuary temple to his valley temple and is decorated with high-quality reliefs depicting a range of colourful hunting scenes showing giraffes, lions and leopards. Although many people believe this was the end of the Golden Age of the Old Kingdom, it is interesting to note that the artists were still ignorant of some biological facts (Spinage 1968a). Among the giraffes, stags, bears, leopards, hares and hedgehogs is a maned lion giving birth!

By the time the New Kingdom made its appearance (1500–1350 BC), a change had occurred in the way giraffes were portrayed. In the Old Kingdom, giraffes are seen in hunting scenes, suggesting they were part of the rich savannah fauna of Egypt at that time. By the New Kingdom, they tend to be exotic animals, coming from afar, perhaps indicating that the giraffe had, by this time, disappeared from the lower reaches of the Nile. We know that Egypt had trading connections with regions further south. Queen Hatshepsut, who reigned between 1501 and 1480 BC, sent a trading voyage south, to Punt (Somalia and the Red Sea coast). A report of that five-ship expedition survives on reliefs in 'The Punt Colonnade' in Hatshepsut's mortuary temple at Deir el-Bahri, located on the west bank of the Nile, opposite the city of Thebes (present-day Luxor). Upon its return, the expedition brought back ivory, silver, gold, myrrh trees and the skins of giraffes, leopards and cheetahs which were worn by temple priests. One relief shows the Land of Punt and the Puntine people, who were black Africans. Donkeys are depicted as the method of transporting goods, and white dogs guard the people's houses. Birds, monkeys, leopards and hippopotamus are seen, as well as giraffes; typical African animals depicted as living in Punt. This was by no means the only expedition to southern lands and giraffes are often seen in Egyptian wall paintings of this period. In the tomb of Huy, viceroy of Nubia during the reign of Tutankhamen (1347– 1336 BC) we see Nubians carrying offerings, among them a giraffe.

Fig. 1.4 Carved schist cosmetic palette, showing a nice giraffe at the bottom. Late predynastic (Nagada Iic/d or IIIa) from the main deposit at Hierakonpolis. Ashmolean Museum, Oxford. Photograph by Jo Shorrocks.

Rekhmire was Vizier of Egypt during the reign of Tuthmose III (1479–1425 BC) and therefore in charge of much of the day-to-day administration in Egypt. His tomb, in the Valley of the Nobles, is one of the largest and most decorated tombs among all of the Theban nobles' tombs, full of beautiful paintings of daily life. One painting, with five sections, one above the other, shows the tribute brought from Punt and the Mediterranean Islands. In one frame, Nubians or Kushites are bringing various animals – giraffes, leopards, baboons, monkeys, cattle and dogs as well as ostrich eggs and feathers (Fig. 1.5). The last giraffe picture of dynastic Egypt is on a wall of the temple of Rameses II (the Great), at Beit el-Wali in Nubia (Fig. 1.6). In the bottom scene, the pharaoh receives leopard skins, giraffe tails, giraffes, monkeys, leopards, cattle, antelopes, gazelles, lions, ostrich feathers and eggs, ebony, ivory, fans, bowls, shields made of animal hides, and gold.

What purpose did these giraffes and giraffe products have? Were they tokens of regard, pets or simply exotic curiosities from a foreign land? Certainly animal skins were worn by priests in the temples and giraffe tails were used as fly

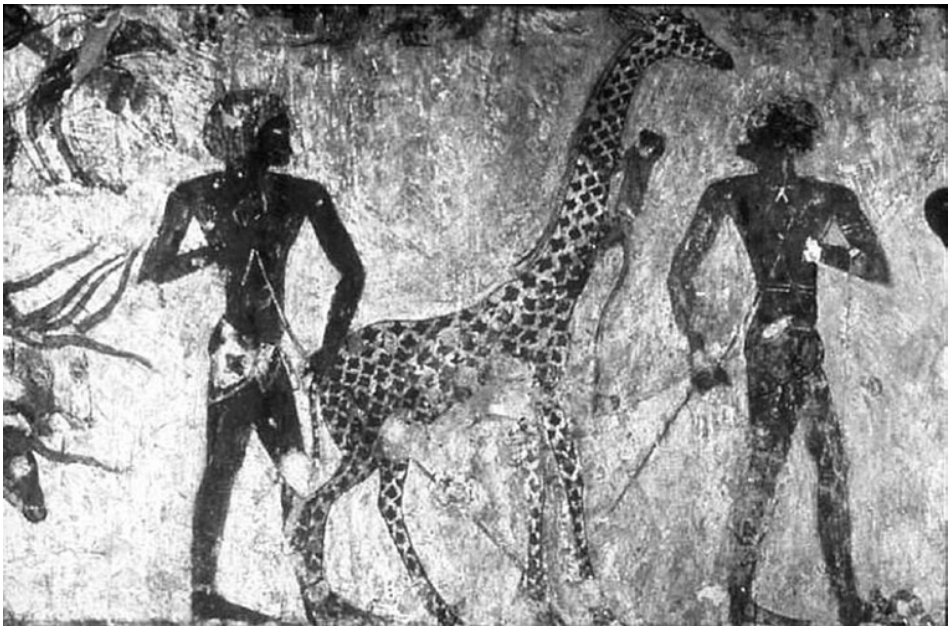

Fig. 1.5 Tomb of Rekhmire about 1504–1540 BC. Photograph by kind permission of Nile Sun Hotels & Cruises, Egypt.

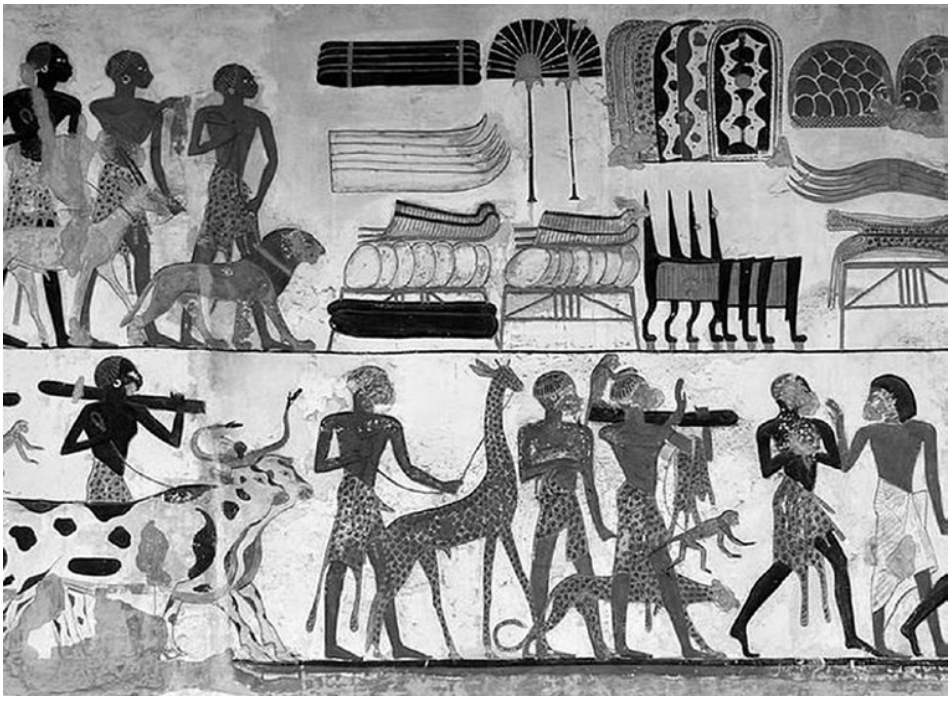

Fig. 1.6 Wall painting in temple of Beit el-Wali, which Rameses II constructed in Nubia.

whisks (they are still today). Some exotic animals were kept as pets and there is a suggestion that giraffes were 'tamed' and kept on leashes. However, there were Egyptian zoos or menageries. Queen Hatshepsut acquired baboons when she had myrrh saplings brought to Egypt from the Horn of Africa, which presumably would have been kept somewhere, but no records exist. Among the animals imported from Punt were rhinos, giraffes, leopards, monkeys and more familiar species like cattle and hounds. There was a zoo at Per-Ramesses, the capital Rameses II built in the eastern Delta, containing, according to the bones found, large animals. Lions, elephants and possibly giraffes were among the animals kept.

What is likely is that the perception of giraffes changed over the 3000 years of Egyptian civilisation. In predynastic and Old Kingdom times, giraffes were undoubtedly hunted locally, probably for their skins and tails. By New Kingdom times, they had disappeared from Lower Egypt and were now exotics, brought as tributary gifts by Nubians and Kushites. However, what is clear is that to the Egyptians giraffes were real beasts. In contrast, the Greeks saw them as almost mythical, a product of the union of a camel and a leopard, and so named them camelopards. They heard rumours of this strange animal but never saw one. After the time of Alexander the Great (356–323 BC), the Ptolemys ruled Egypt and a Greek scholar, named Athenaeus, described a celebration of the feast of Dionysus in which several animals were paraded through the streets of Alexandria … ostriches, hartebeest, elephants, oryx, leopards, lynxes, lions, cheetahs, a rhinoceros and a giraffe. In 104 BC another Greek scholar, Agatarchides of Cnidus, gave us the first written description of a giraffe in his book, *On the Erythraean Sea*, on the races and animals to the west of the Red Sea (Burstein 1989).

> *Among the troglodytes lives also an animal which the Greeks call Camelopardalis, a composite names which describes the double nature of this quadruped. It has the varied coat of a leopard, the shape of a camel and is of a size beyond measure. Its neck is long enough for it to browse in the tops of trees.*

The next notable appearance of a giraffe is the one brought from Alexandria by Julius Caesar in 46 BC, at the end of the civil war (Healey 1991, from Pliny). Some people believe it may even have been a present from Cleopatra, who later followed it to Rome. It was the first giraffe to be seen in Europe. Caesar's return to Rome, and the end of the civil war, were celebrated with five separate triumphs. Caesar exhibited his giraffe at the games in the Circus Maximus, Rome's chariot racing stadium and mass entertainment venue. Apparently there were contests in 'a kind of hunting-theatre of wood …' (Carter 1996, from Appian; Cary 1914, from Dio). Like the Greeks, the giraffe appeared to the Romans to be part camel and part leopard, and was referred to as the camelopard (Kent 1938, from Varro; Healey 1991, from Pliny). Curiously, Pliny also calls it an *ovis ferae* or wild sheep. Sadly, many of the Roman recordings of giraffes are of their killings in the Circus or Coliseum. Commodus, in the second century AD, slaughtered a giraffe and rhinoceroses, as well as five hippopotamuses and two elephants, in 2 days (Cary 1914, from Dio). Dio may even have witnessed the event. In AD 248, Philip the Arab (Roman Emperor from AD 244 to 249) celebrated the millennium of Rome's founding with the display in the Circus Maximus of 10 giraffes, elephants, tigers, lions, leopards, hippopotamuses and a rhinoceros (*Historia Augusta*, 33). This was probably the largest number of live giraffes ever brought together in Europe, although Aurelian (Roman Emperor from AD 270 to 275) is said to have marked his triumph over Zenobia, queen of Palmyra, in AD 274 with a presentation of giraffes (*Historia Augusta*, 33).

In 1996, some mosaics were uncovered during a highway construction in the modern Israeli town of Lod, not far from Tel Aviv. Lod was ancient Lydda, which was destroyed by the Romans in AD 66 during the Jewish War. Refounded by Hadrian as Diospolis, Lydda was

awarded the rank of a Roman colony under Septimius Severus in AD 200. It remained in Roman hands until becoming a Christian city and eventually succumbing to Arab conquerors in AD 636. The large rooms in which the mosaics were found probably belonged to a private house and served as a series of reception or audience halls where visitors were met and entertained. The main panel, measuring 13 square feet and set in the centre of one of the floors, is divided into a series of smaller squares and triangles by an interlocking cable pattern, in which various birds, fish and mammals are depicted. These surround a larger octagonal space populated by a lion and lioness, an elephant, a giraffe, a rhinoceros, a tiger and a wild bull. The depiction of an elephant, giraffe and rhinoceros would have been very 'exotic' in a place such as the Roman colony of Lydda. On this coastal plain of ancient Palestine, such savannah animals would have been quite unfamiliar. In fact, the giraffe is rarely depicted in ancient art, which makes its appearance in the Lod mosaic all the more remarkable. The only other two that I know of include the head of a giraffe on an elaborate Roman marble sarcophagus, dated about AD 190. Here the giraffe appears in a scene depicting a triumphal procession, together with lions, elephants and leopards. Another giraffe appears on a fragmentary late Roman, or early Byzantine, mosaic dated to the fifth century AD.

Following the demise of the Roman Empire, we see little reference to giraffes in western Europe for nearly a thousand years. One exception is the book by the Bishop of Seville, Isidorus Hispalensis (AD 602–636), called *De Natura Rerum*. In natural history books of this time, animals were often arranged in alphabetical order and so chameleon was followed by chamelopard. The good bishop got the two mixed up:

> *Chamelopardus does not have one colour, but is spotted with a differing pattern like a leopard. Now it is called this because it has the likeness of a camel and a lion. The body of this Camelion changes to the colours which it sees by a very easy conversion, because the size of other animals is not so easy for conversion. It is called the Camelopard because while it is sprinkled with white spots like a leopard it is however in its neck like a horse, in its feet like an ox, in its head like a camel; Ethiopia produces it.'*

With the Arab Conquests (622–750) reference to giraffes moves back to northern Africa and the East. Egypt was conquered in 642, 10 years after the death of the Prophet. In 652 the Emir Sad Ibn Abi Sarh invaded Nubia and in the treaty arrangements arranged for an annual payment of 400 slaves, a number of camels, two elephants and two giraffes. During the reign of the Caliph Al-Mahdi this was reduced to 360 slaves and one giraffe. Amazingly, this tribute was made until 854 when after an abortive Nubian revolt, there is no more mention of tributary giraffes. One of the great Arab writers was Amr Ibn Bahr, or al-Jahiz (773–869), who wrote a Book of Animals (*Kiab al-Hayawan*) in which, once again, many of the bizarre ideas about the origin of the giraffe, from a female camel and a male leopard, were recounted. Interestingly, these early writers all seem to perceive Nubia as the home of the camelopard.

The next people to 'find' the giraffe were the Chinese, in the mid-12th century. In one of the earliest writings, in the book *Su-po-wu-chi*, by Li Shi, we find:

> *The country Po-pa-li harbors a strange animal called the camel-ox (t'o niu). Its skin is like that of a leopard, its hoof is similar to that of an ox, but the animal is devoid of a hump. Its neck is nine feet long and its body is over ten feet high.*

Po-pa-li is thought to be the coast of Somalia (Laufer 1928) and the stated length of the giraffe's neck is quite accurate, considering that the writer might not have ever seen a living specimen. The designation 'camel-ox' corresponds exactly to a Persian designation of the giraffe, *ushtur-gaw* (*ushtur*, 'camel' ; *gaw*, 'ox, cow'), mentioned as early as the 10th century by the Arabic writer Masudi. It may therefore be that the description of the giraffe had come to China from Persia. The second reference to the giraffe is made by Chao Ju-kwa in his work

Chufan chi, written in 1225. This author was collector of customs in the port of Ts'uan-chou fu in the province of Fu-kien, where he came in close contact with Arabian merchants and representatives of other foreign nations who then had a thriving commercial exchange with China. From oral information given to him by foreign traders, and from earlier Chinese sources, he compiled his brief book. In his notes on the Berbera or Somali coast of East Africa, he mentions as a native of that country:

> *a wild animal called tsu-la, which resembles a camel in shape, an ox in size, and is yellow of colour. Its fore legs are five feet long, while its hind feet are only three feet in length. Its head is high and looks upward. Its skin is an inch thick.*

The word *tsu-la* used in this text is not Chinese but is of Arabic origin; it is intended to reproduce *zarafa*, the Arabic term for the giraffe. In fact, the ancient Chinese did not see a giraffe until the 15th century, under the Ming dynasty, when it was mistaken for the *ki-lin*, a fabulous mythical creature. This confusion is surprising since the *ki-lin* was said to have the body of a deer, the tail of an ox, a single horn and to be covered in fish scales. It was said to symbolise gentleness, goodness and benevolence. Perhaps this was where the confusion lay with the graceful giraffe. However, the fabulous *ki-lin* of antiquity was reputed to appear only at the time of a virtuous ruler, and this may have had more to do with the 'confusion' with the newly arrived giraffe.

Late in 1486–7, in an attempt to establish better diplomatic relations with Florence against the Ottoman Turks, al-Ashraf Qaitbay, the Mamluke Sultan of Egypt, presented a female giraffe to Lorenzo de' Medici (known as Lorenzo the Magnificent). Lorenzo had read of the spectacular success of Caesar's giraffe, and possibly saw it as a way to cement his reputation in Florence by possessing one. He also realised that he could gain further political influence by passing the animal on, and he promised to send it to Anne of France (Regent of France 1483–1491), after its stay in Florence. In Florence, the giraffe was an immediate sensation. Although Cosimo de' Medici, Lorenzo's grandfather, had maintained a large zoo, and had previously featured a giant mannequin of a giraffe in the animal entertainments he provided for the citizens of Florence, this was arguably the first time a living example had been seen in the city, and even in the whole of Italy. I say 'arguably' because there are reports that Frederick III of Sicily had been given a giraffe in 1261 by the Sultan of Egypt in exchange for a white bear, and that the Duke of Calabria, Duke of Ferrara and the rulers of Naples all owned giraffes. If these giraffes existed, they certainly did not have the success that Lorenzo's giraffe enjoyed. It was immortalised in paintings by Botticini, Vasari and Bacchiacca, and in frescoes and poetry. The poet Antonio Costanzo described it freely roaming the streets:

> *I have also seen it raise its head to those onlookers offering to it from their windows, because its head reaches as high as eleven feet, thus seeing it from afar the people think that they are looking at a tower rather than an animal. Ours appears to like the crowd, it is always peaceable and without fear, it even seems to watch with pleasure the people who come to look at it.*

Although Anne of France had written reminding Lorenzo of his promise to send the giraffe to her, she was to be disappointed. Lorenzo had built special stables for it, either at the family's villa at Poggio a Caiano or in the Via della Scala in Florence itself, with heating to protect it from the damp Florentine winters. Unfortunately, shortly after its arrival the giraffe broke its neck and died after its head became stuck in the beams of these stables.

A living giraffe was not seen in Europe again until 1827, when Muhammad Ali, the Ottoman viceroy of Egypt, presented a giraffe to both Charles X of France and George IV of the United Kingdom and, 2 years later, to the Hapsburg Emperor Franz II of Austria. Indeed, it had been 340 years since Anne of France had written to Lorenzo de' Medici, beseeching him to keep a promise to send his own giraffe to her, 'for this

is the beast of the world that I have the greatest desire to see'. The 1827 giraffes were diplomatic gifts intended to mollify public sentiment at the treatment of the Greeks during their war of independence, and they caused a sensation in art and fashion in *la mode à la girafe*. However, they did not prevent a combined British, French and Russian naval force from decisively defeating the Ottoman Turks a few months later at the Battle of Navarino (20 October 1827), in what was to be the last engagement fought with sailing ships. Two of the Egyptian giraffes were siblings and upon arrival in Cairo, the French and English consuls drew lots for them, with the French winning by far the better draw, as later events transpired, since the smallest sibling was awarded to George IV. Sadly this fragile individual, lashed to the back of a camel when it could no longer walk, was injured during its journey and its legs crippled. The animal arrived in England and was tended in a building in the grounds of Windsor Castle, out of public view. Requiring the aid of a special harness to stand, within 2 years the wretched creature weakened and died. It was painted, in late 1827, by the animal painter Jacques-Laurent Agasse, who tactfully omitted the pulley and harness. The giraffe sent to Vienna also suffered during its transport by camel, an injury no doubt aggravated by walking from Trieste to Vienna, where it succumbed to disease within ten months.

The giraffe presented to Charles X was more fortunate, travelling by ship to France with every comfort. She was allocated her own cabin steward, a groom from the French Consulate, and cared for by native keepers from the Sudan, all of them charged with attending to her every whim. As with the English giraffe, three cows accompanied her on her voyage to supply her daily 6 gallons of milk, and she arrived in the port of Marseilles in a healthy and thriving condition. Upon noting how the fashionable 'mademoiselle' spurned plain water, her keepers devised a menu to suit her appetite, which was observed to favour milk and barley. After debarkation, a hole having been cut in the upper deck to allow her head to poke through, this pampered giraffe walked in royal livery, cheered by boisterous crowds, the 550 miles from Marseilles to Paris. Here she was presented to Charles X and ate rose petals from his hand. The giraffe was kept in one of the hexagonal wings of the Rotonde de la Menagerie, the world's first civil zoo, in the grounds of the Jardin des Plantes, where she was seen by over 600,000 visitors in the first 6 months alone. The giraffe started a 'giraffemania' in the art world: *á la girafe* furniture, wallpaper, porcelain and even soap, decorated with a giraffe pattern, were produced. As Étienne Geoffroy Saint-Hilaire, who had accompanied the giraffe from Marseilles to Paris, wrote, her new home, with its parquet flooring and straw matting on the walls, was 'truly the boudoir of a little lady'. There, much to the chagrin of the United Kingdom, the animal lived quietly for another 18 years, her influence on fashion and the interest of the public gradually waning. She died in 1845 and her corpse was stuffed and sent to the museum at La Rochelle. Here, some 168 years after her death, she still has an ability to cause surprise and wonder, when unsuspecting visitors round the stairway and encounter Mademoiselle Zarafa peering impassively down from the half-landing where she stands. An entertaining account of the French giraffe, and the surrounding historical events, is given by Allin (1998).

Because England did not have a giraffe of its own after 1827, and this was seen as a national disgrace, the new King William IV commissioned a French trader, Monsieur Thibaut, to search for giraffes for England. Thibaut eventually captured eight Nubian giraffes in the Sudan, and four survived the journey to London. So, on 25 May 1836, three males and a female accompanied by their native handlers and Thibaut arrived at the docks in London. The new arrivals made their own procession, of shorter duration than that of *Zarafa* from Marseilles to Paris. A stately 3-hour parade, escorted by Thibaut and the Nubian keepers in native dress, alongside a detachment from the Metropolitan Police, brought them safely to the

Zoological Gardens that evening, where they settled immediately into the new elephant house, their temporary lodgings until their own purpose-built accommodation was completed the following year. Thibaut was paid the enormous sum of £700 for the animals. The lone female, Zaida, gave birth to her first offspring in 1839, and in subsequent years, 17 young were born and these giraffes populated London Zoo until 1881. Following this eventual success (except for the brief period of 1882–1895), London Zoological Gardens has never been without giraffes. The lithographer George Scharf (1788–1860), whose artwork documented events of everyday life in London, recorded the giraffes' arrival in 1836 with an engraving of the four giraffes, their handlers and Monsieur Thibaut. This was immediately followed by the production of John Ridgway's giraffe patterned transfer wares showing the engraving (Fig. 1.7).

The original giraffe house at London Zoo still houses giraffes. It was built between 1837 and 1838 and designed by the architect Decimus Burton and is now a Grade II listed building. Wings were added in 1849–1850. There was bomb damage in 1940 and Franz Stengelhoffen and Colin Wears rebuilt it in 1960–1963.

The first living example of the southern giraffe was imported into Europe in 1895 for London Zoo for a price of £500. It had been captured on the Sabi River in Portuguese territory and brought down to Pretoria, whence it was conveyed to Delagoa Bay and shipped to Southampton.

In 1863 Lorenzo Casanova, a traveller and animal collector, returned from the Egyptian Sudan to Europe with a collection of six giraffes, the first African elephants and many other rare mammals. In 1864 he entered into a contract with the firm of Carl Hagenbeck according to

Fig. 1.7 Plate printed with giraffes and handlers by John Ridgway, ca.1836.

which all animals to be secured on his future expeditions to Africa should be sold to the Hagenbecks. In 1870 the largest consignment of wild animals that ever reached Europe arrived at Trieste, consisting of 14 giraffes, 90 other mammals and 26 ostriches. The giraffes were distributed over the zoological gardens of Vienna, Dresden, Berlin and Hamburg. About that time several itinerant menagerie owners and showmen also began to keep giraffes. Renz, the celebrated circus director, utilised giraffes, antelopes, buffalo and many other creatures for his pantomime 'The Festival of the Queen of Abyssinia'. During the period 1873–1914 the firm of Carl Hagenbeck imported a total of 150 giraffes (called at that time four species, *Giraffa camelopardalis* of Lower Nubia and Abyssinia, *G. capensis* of the Cape territory, *G. hagenbecki* from Gallaland, and *G. tippelskirchi* from German East Africa). The largest specimen imported by Hagenbeck, about 11.5 feet in height, came from the Galla country, and was transmitted to the Zoological Garden of Rome. Prior to 1914, Hagenbeck maintained a station for captive animals, at the foot of Mount Kilimanjaro, where the captured young giraffes moved freely in a larger kraal, after being hunted and lassoed by horsemen. The average price for a young giraffe before the First World War was about $1500–2000.

In the United States of America giraffes began arriving towards the end of the 19th century. The Zoological Society of Philadelphia keeps records of all the animals that have arrived at the zoological garden which is the oldest in the United States. The earliest record of giraffes is an entry for 11 August 1874, when five males and one female were purchased. The zoo in Lincoln Park, Chicago, received two giraffes, a male and a female, 2 years old, in October 1913, as a gift from Mrs Mollie Netcher Newberger. The female died in December 1915, the male, in May 1919.

This chapter has been a short introduction to the 'history' of giraffes and their effect on human culture, from the prehistory of North Africa to the art of Victorian England. For a much fuller account, I recommend the old book by Berthold Laufer published in 1928, called *The Giraffe in History and Art*. It is available as a free download on the internet. Of course, this is not the complete history of the giraffe, since its ancestors, and relatives, go back much further in the fossil record. This longer tale, culminating in the subspecies, or species, we presently see in Africa is the subject of the next chapter.

CHAPTER 2
Origins

Introduction

The origin and evolution of the present-day giraffe are not crystal clear, although a credible story, combining fossil evidence and molecular evidence, can certainly be told. A summary would be as follows. Their recent ancestors probably evolved in southern central Europe about 8 million years ago (Mya). These ancestors appear to have arisen from the gelocids (early artiodactyls) that lived in southern Eurasia 20–25 Mya, and it's with these gelocid ancestors that our 'recent' giraffe ancestral tale begins. From this gelocid stock arose the palaeomerycids, and from them the Antilocaprinae (Pronghorns) and two subfamilies of giraffids, the Climacoceratidae and Canthumerycidae. The Climacoceratid line ended with the now extinct massive giraffid *Sivatherium*. The Canthumerycids gave rise to the okapi and giraffes via the intermediate forms of *Giraffokeryx, Palaeotragus* sp. (of which the okapi is the extant form), *Samotherium* sp. and *Bohlinia* sp., all of which are now extinct. The *Bohlinia* line entered China and north India, and evolved into typical *Giraffa* species, becoming extinct there about 4 Mya. African *Giraffa* entered that continent, via Ethiopia, about 7 Mya. Here, unaffected by the climate changes occurring to the east and causing the extinction of their Asian counterparts, *Giraffa* radiated into several species, culminating in the evolution of *G. camelopardalis* in East Africa, from where it dispersed to its modern range.

That is the brief tale, but there are many additional facts and informed speculations, and this chapter will look at these in more detail. But first, let me recount some background information about the ancestors of the gelocids, the origin of artiodactyls, and the evolution of mammals in general, that will be useful. Many of you will know this, but for those who don't, or have forgotten, it will set the background.

Modern molecular opinion (Macdonald 2001; Murphy *et al*. 2007), based on both nuclear and mitochondrial genes, now places placental mammals into four groups, or clades: the Euarchontoglires, Laurasiatheria, Xenarthra and Afrotheria. The Euarchontoglires include the primates, insectivores and rodents. Members of the Xenarthra are found entirely in the New World and include such mammals as anteaters, sloths and armadilloes. The Afrotheria are interesting. They are entirely African and contain a very diverse group of species which include elephants, hyraxes (conies), the aardvark, golden moles and elephant shrews. Within the Laurasiatheria are the carnivores (e.g. cats, dogs, badgers and otters), ungulates (e.g. giraffes, antelopes, horses and rhinoceroses), whales and dolphins, bats and the enigmatic pangolins. This molecular evidence also supports the monophyletic origins of the Euarchontoglires and Laurasiatheria into a clade known as Boreoeutheria (Springer *et al.* 2004). Each of these four superordinal clades and Boreoeutheria have been verified by the identification of numerous rare genomic changes such

The Giraffe: Biology, Ecology, Evolution and Behaviour, First Edition. Bryan Shorrocks.