in this country at all events, of the now extinct race of lions which formerly inhabited Cape Colony. It is a testimony of the accuracy of the old records of the characteristics of the lions of that part of Africa, but it may be assumed that it did not long survive the middle of the last century."—Pocock (*The Field*, Aug. 8th, 1931).

The so-called 'claw' at the end of a lion's tail is usually no more than a small horny scale attached to the skin at the tip of the last vertebra.[1]

Weight: 516 lb. (Montgomerie); 434 lb. (Yellowby); 412 lb. (Roosevelt); 410 lb. (Selous);[2] 450 lb. approx. (Lyell); 400–420 lb. (Bryden); 400–500 lb. (Kirby); (♀) 260 lb. (Meinertzhagen).

Shoulder height: "Lions seldom 'stand' over 3 ft. 2 in. at the shoulder."—Pocock. 3 ft. 8 in. (Selous—a large specimen); 3 ft. 7 in. (Lyell). The shoulder heights of lions recorded by Rowland Ward (1928) range between 3 ft. 4 in. and 3 ft. 9 in.; of a lioness (Meinertzhagen), 2 ft. 10½ in.; 90–120 cm. (Wilhelm).

A living adult Manchurian Tiger measured by Pocock stood 38 in. at the shoulder. He was bigger than any Indian specimens in the Zoological Gardens.

Dimensions.—According to Vaughan-Kirby 9 ft. 6 in. (along the contour) is about the average total length of a good lion.

Lyell estimates the 'average' length to be not more than 9 ft.

The largest lion recorded by Rowland Ward (1928 ed.—before skinning) measured 10 ft. 7 in. (de la Poer); of a dressed skin (Woodhouse) 11 ft. 1 in.

Fourteen other specimens with a length of 10 ft. or over (before skinning) are recorded.

The two largest lionesses recorded (1928 ed.) measure 9 ft. 6 in. and 9 ft. 5 in. (an Indian specimen).[3]

Leopard—Afrikaanse Tier

Panthera pardus Linnæus

PANTHERA PARDUS SHORTRIDGEI.

Panthera pardus shortridgei Pocock, 1932, P.Z.S., pp. 584–587, text Fig. 8b.

Type (in the British Museum) from Gangongo, Western Caprivi, South-West Africa.

PANTHERA PARDUS PUELLA.

Panthera pardis puella Pocock, 1932, P.Z.S., p. 588, text Fig. 9.

Type (in the British Museum) from Okorosave, Central Kaokoveld, South-West Africa.

[1] There are better-developed terminal 'claws' on the tails of the Nail-Tailed Wallabies (*Onychogale*) and on the Marsupial Rabbit (*Thallacomys lagotis*), that of the latter being slender, pointed, slightly curved, and not unlike the sting of a scorpion.

[2] According to Lydekker, the heaviest lion shot by Selous weighed 500 lb. The heaviest lion recorded by Rowland Ward (1928) weighs 516 lb. (Montgomerie), the heaviest tiger recorded being 645 lb. (Morbey). In the 1914 ed. (*Records of Big Game*) the weight of an Indian tiger is recorded at no less than 700 lb. (Goring-Jones).

[3] The largest tiger recorded (1928 ed., p. 476) measured 11 ft. 5½ in.—Of a dressed skin from Mongolia 13 ft. 6 in.

NATIVE NAMES:

PERSONALLY COLLECTED

Herero, Ovambo, Berg Damara: *Ónkwi, Óngwi.*
Bechuana: *Ńgwi, Ńkwi.* Ovadirico, Ovacuangari: *Ńgway.*
Mambakushu: *Nzógo.*
Nama Hottentot: */Garub* (general name); *!Hu:ru:tub* or *ǂHoë:nab,* (Large 'plains' race—*P. p. shortridgei*); *!O:we:teb* or *ǂHoë:seb,* (Small 'hill' race—*P. p. puella*).
Hei||kum Bushman: *ǂHoë-nab.*
||K'au||en & !Kung Bushmen: *!Hom.*
Naron Bushman: *!Oëb.*

OTHER SOURCES

Herero: *Ongue* (Zukowsky).
Bechuana: *Inkwe, Nkwe* (Bryden & Kirby); *Ingue* (Zukowsky).
Mambakushu (Simbukushu): *Ndo* (*Njo*) (Balme); *Ndöo* (Zukowsky).
Sikololo: *Ingwe* (Balme); *Nkwe* (Lancaster).
Chinkoya, Mashasha: *Kampulu* (Lancaster).
Chilavale: *Nkwi* (Lancaster). Chila: *Shiluwe* (Lancaster).
Tonga: *Siluwi* (Lancaster). Kaonde: *Chisumpa* (Lancaster).
Nama Hottentot: *!Hurudub* (Bleek & Krönlein).
||K'au||en Bushman: *!Khum* (Bleek).
Naron Bushman: *!Koe:ba* (Bleeq); *!Oe* (Schinz).
!Kung Bushman: *K'au* (Bleek); *Um* (Zukowsky).
Sikwengo Bushman: *Hwe* (*Uye*) (Balme); *Oë* (Zukowsky).
Masarwa (Kakia) Bushman: *!Hãũ* (Bleek).
/Auni Bushman: *!K'aru* (Bleek).
||N!ke Bushman: *||Kabe* (Bleek).
/Kam-ka!ke Bushman: *||Kauë* (Bleek).
!O!kung Bushman (Central Angola): *!ʔHm*[1] (Bleek).

DISTRIBUTION IN SOUTH-WEST AFRICA.—Leopards are widely distributed over South-West Africa, except perhaps along the extreme coastal portion of the Namib Desert. They are particularly plentiful throughout Damaraland—from the mountains on the west to the Kalahari sand-plains in the east, the Kaokoveld, Grootfontein District, and the Caprivi.

Leopards are rare in the vicinity of the Orange River between Upington and Kakamas, although presumably increasing in numbers in the hill country farther west between the Augrabies Falls and the coast.

They are comparatively scarce in the arid and open plains of Great Namaqualand, and somewhat less numerous than usual in the more thickly populated parts of Ovamboland.

As an indication of the number of leopards and cheetahs that must exist in Gobabis District, it may be recorded that Balzar, a farmer near Oas, in

[1] ʔ denotes a glottal stop.

18 years trapped or shot no fewer than 125 leopards and 93 cheetahs on his estate; while Versfeld, the owner of an adjoining farm, recently accounted for 19 leopards in 2 years.

General Distribution outside South-West Africa.—The Leopard ranges over practically the whole of Africa, and although much thinned out in the neighbourhood of the larger towns, it has not completely disappeared from any part of Southern Africa.

"In Africa the Leopard occurs everywhere, except in waterless desert tracts, from the sea-coast to the limits of vegetation on the highest mountains."—Roosevelt & Heller.

"The Leopard is very rare in Egypt; it occurs in only two districts—the mountains of Southern Sinai and the desert country west of Alexandria between Mariut and Siwa. A specimen was shot by Langdale Kelham near the Moghreh Oasis (Moghara) in the Libyan Desert as recently as 1913." (Flower P.Z.S., 1932, II, p. 387).

Outside Africa leopards are widely distributed through Asia to as far west as the Caucasus and as far east as Japan, except in Siberia, the higher parts of Tibet, and the more eastern of the Malay Islands.[1]

They are very rare to-day in Palestine, although in 1917 a specimen was shot near Mount Hermon.

Historical.—Kolbe (1719) recorded leopards from near Cape Town.

"The Leopard formerly ranged over Western Europe, as is shown by fossil remains from caves in Great Britain, Spain, France and Germany."—W. Sclater.

Habits.—Leopards go about singly or in pairs.[2]

"A male and female will remain in company only during the mating time, although the latter may be accompanied by the surviving member, or members, of the last litter."—S. Hamilton.

Leopards are more exclusively nocturnal than lions, but perhaps not more than tigers. Nevertheless, leopards may now and then be seen wandering about at any hour of the day during cloudy weather; when moving in shadowy forest or amongst rocks they blend with their surroundings so closely that to keep them in view is often extremely difficult. They also occasionally lie out and sun themselves in the open.

"On one occasion a leopard was observed hunting for small antelope by day; they are not infrequently heard snarling during the early hours of the morning."—Wilhelm.

They lie up by day in caves, in deep crevices under rocks, or in dense thickets. ("Occasionally along the horizontal branch of a tree."—S. Hamilton.)

Their lairs are often at considerable distances from water.

[1] Leopard occur in Java, Madoera, and the Kangean Archipelago; doubtfully in Sumatra; but not in Borneo, Bali, or any of the islands farther east. Tiger occur in Sumatra, Java and Bali.

[2] According to Sclater, small parties of from four to six have been seen together.

Leopards are good climbers and frequently take refuge in trees when hard pressed. They take to water readily, and regularly cross rivers.

"Leopards come to water as a rule after dark, although an individual was once observed drinking in broad daylight. During the dry season they visit water every second or third day: the male occasionally announces his arrival by a deep purring, which may be answered by the female if the two happen to arrive together."—Wilhelm.

The usual night sounds made by a leopard, which I believe are more frequently heard during the mating season, are a series of rather harsh 'coughs,' repeated with irregular pauses several times in succession with a tendency to subside into subdued gasps. The call of a leopard, allowing for its lesser volume, bears some resemblance to the subdued 'cough' of a lion. In the Okavango Valley, where they are particularly numerous, leopards were heard almost nightly during the months of September and October.

When caught in a trap, a leopard remains silent until approached—unlike a lion, which is apt to groan and snarl throughout the night.

Although never noisy animals, leopards are more often heard than tigers, where the two occur together; but this may be on account of the former being as a rule the more plentiful.

The spoor of a leopard is rounder and larger than that of a cheetah, the only spoor, in Africa, for which it could ever be mistaken; that of even a young lion cub is much larger.

The largest animals killed by leopards according to my own observation have been cow kudu and immature donkeys. (In India full-grown cattle tied up in the jungle to attract tiger are seldom molested by leopard.)

"In the Kruger National Park leopards confined their hunting chiefly to impala, bushbuck, and duiker."—S. Hamilton (1932).

S. Hamilton records a waterbuck cow, Roosevelt a large Grevy zebra colt, and Wilhelm an immature gemsbok killed by leopards. Drake-Brockman records that large Somali leopards occasionally kill camels.

The animals more usually attacked include small and medium-sized antelope (impala, reedbuck, duiker, klipspringer, etc.), sheep, goats, pigs, antbears, porcupines, baboons, monkeys—down to dassies, guineafowl, domestic poultry, and even small rodents. The smaller carnivorous mammals (domestic dogs, jackals, foxes, genets, etc.) are also preyed upon.

Baboons are chiefly hunted by night, especially in regions where they sleep among rocks. Lyell believes that leopards do not often interfere with baboons (by day) except when they find one detached from a troop. According to natives in South-West Africa, leopard and caracal occasionally kill ostriches sitting on eggs by springing on their backs and biting through their necks.

"A duiker or other small antelope is killed by a dislocating stroke on the neck."—Wilhelm.

Stevenson-Hamilton records a case of a genet being killed and eaten by a leopard, the fur having been first 'scratched' off. He also notes that, when the prey is a small carnivorous animal, the death wound is inflicted by a bite which severs the jugular vein or the neck vertebræ. I once kept a semi-tame caracal

which removed in some unknown manner almost every particle of the fur, after killing a young jackal.

In the Western Caprivi, a trap that had already caught a caracal was afterwards visited by a leopard which devoured the bait in the trap and killed the caracal by a neat bite behind the ear, but left it otherwise untouched—and ended by getting caught in a second trap not many yards away.

"Like other cats, the leopard is sensitive to pain and is easily held by even a small trap; nor does it, like a hyæna, tend to splinter its teeth by biting the iron."—Roosevelt and Heller.

Man-eating leopards appear to be of much rarer occurrence in Africa than in India, although instances in Africa have come to the notice of Lyell, Roosevelt and Heller, and Austin Roberts.

"A black leopard lived in the Mysore Zoo for 21 years. The specific longevity for a leopard is probably between 5 and 6 years. The potential longevity about 20 years."—Flower.

Breeding Habits.—Like the Lion, the Leopard appears to have no fixed breeding season. Kirby notes that cubs are often born between October and December. According to Stevenson-Hamilton, many are born during the early South African winter and spring: although cubs are frequently seen during the weaning stage, a leopardess is very often accompanied later on only by a single cub. The number of cubs in a litter appears to average from two to four, although as many as six have been recorded. Haagner records that among several litters born at the Pretoria Zoo, three has been the usual number; these at birth being barely six inches long, blind and helpless.

"In South-West Africa, lion cubs were mostly observed during the rains."—Wilhelm.

Period of gestation, 92-95 days (Haagner—Pretoria Zoo):

"About three months" (S. Hamilton): 90-100 days—(Wilhelm).

Newly-born leopard cubs are described as pale greyish fawn with longer and more woolly fur and ill-defined markings, the spots being small, comparatively indistinct, and hardly showing any rosette.

"The young are much more finely spotted than the adults, owing to the spots which later coalesce and form the rosettes being widely separated and appearing as distinct solid spots. This broken condition of the rosettes remains until the animal is of large size."—Roosevelt and Heller.

Variation.—Throughout the greater portion of its range, both in Africa and India, sportsmen—and in many districts natives also—are accustomed to distinguish two varieties of leopard, a smaller and a larger. Either the smaller race is regarded as being the 'hill' form and the larger the 'plains' form, or vice versa.

In South-West Africa the 'Hill' Leopard is known to Nama Hottentots as *ǂHoë:seb* or *!O:we:teb* and the 'Plains' Leopard as *!Hu:ru:tub* or *ǂHoë:nab*. In the N.E. Transvaal, according to S. Hamilton, the 'Hill' variety is called *Idzimba*, and the 'Plains' variety *M'balana*.

Without losing sight of the fact that leopards vary individually, the presence

of mountains, even when of no great height, certainly does appear to exert an influence on the tendency towards stabilised variation. The occurrence of associated races, one on the hills and the other on the plains, must with certainty lead to considerable intergradation. It is presumed that smaller (say 'hill') forms and larger (say 'plains') forms from approximately the same areas must generally be complementary one to the other, and more closely allied—in spite of differences in size and markings—than two equally large (or small) races which inhabit two distant or otherwise discontinuous regions.

In South-West Africa the local (and, in this case, smaller) 'Hill' form (*P. p. puella*) has recently been distinguished by Pocock from the larger and far more widely spread 'Plains' Leopard.

(Two other small African races (*P. p. antinorii*—from Erythræa, and *P. p. nanopardus*—from Somaliland) have been described.

It would seem probable that there are similar cases of dwarfing elsewhere, although perhaps in most instances they present less tangible characters; or there may be a preponderance of intermediates and a rarity of extremes.

Steinhardt described the Kaokoveld Leopard (*P. p. puella*) as a greyish animal with small spots, and suspected it of being a distinct local race. Wilhelm also noted that the Kaokoveld or 'Mountain' Leopard was a smaller and less powerful animal than that occurring in the plains everywhere farther east.

Colour Variation.—Vaughan-Kirby once shot a leopard in South Africa in which the fur was dark vandyke-brown with a surprisingly rich orange gloss, spots either black or sepia-brown but barely distinguishable in some places, and ears without the usual buff tips. The dark-coloured leopards shot towards the end of the last century in the neighbourhood of Grahamstown, and described at the time by Günther as *Felis pardus melanotica* (P.Z.S., 1885, p. 243) are not 'melanos,' like the black leopards of Abyssinia and Malaya. This is clearly shown by the rich buff ground-colour where not obliterated by the extension of the pattern and especially by the whiteness of the underside, and inside of limbs. I know of the existence of six of these specimens, two in the British Museum, one (mounted) in the South African Museum, two (both mounted) in the Albany Museum, and a mounted head in the Port Elizabeth Museum. Pocock (P.Z.S., 1932, p. 583) suggests that these mutations are, or were, locally dominant: but the reason for at least half a dozen abnormal specimens being on record is more probably due to their unusual type, which accounts for their having been sent to museums when ordinary specimens would not have been preserved. There are two locally killed leopards in the Kaffrarian Museum, one from the Perie Forest, and the other from Pluto's Vale (half way between King William's Town and Grahamstown), both of which are normal in coloration and typify the Leopard of the Eastern Cape Province.

A black leopard in the South African Museum is figured in W. L. Sclater's 'Mammals of South Africa,' 1900, I, p. 36—and described therein as follows:

"This form shows no traces of rosettes, but is covered, especially on the head and along the back, with a number of small round black spots, which in one case were so numerous as to be fused together so that the whole of the back and sides

of the animal were quite black, while below and on the lower part of the legs the spots remain separate."[1]

Black leopards have also been recorded from Southern Rhodesia and Abyssinia.[2]

I have never heard of a true albino leopard: Günther described a very pale variety from Kalene Hill, Southern Rhodesia; the ground colour of the skin is pale cream-buff with the rosettes varying from pale to chocolate brown (*cf.* Pocock, P.Z.S., 1932, p. 581).

WEIGHT.—The weights of African leopards recorded by Rowland Ward range between 110 and 140 lb.; those of Indian leopards between 115 and 160lbs.

The heaviest East African specimen recorded by Roosevelt weighed 130 lbs.

Stevenson-Hamilton estimates the weight of an average leopard at between 100 and 120 lbs.—females averaging from 20 to 30 lbs. less.

"The sexes differ much in size, the males usually showing an excess of 40 lb. over females."—Roosevelt and Heller.

SHOULDER HEIGHT.—♂♂30—32 in.; ♀♀ 25—27 in. (Rowland Ward).

28 in. (Kirby—a large specimen). 65—80 cm. (Wilhelm).

Lyell estimates 28 in. to be a good average shoulder height.

DIMENSIONS.—Rowland Ward (1928) records about 20 African and Indian leopards measuring 8 ft. and over in total length (before skinning), of which the two longest are 8 ft. 11 in. (Townsend) and 8 ft. 7 in. (Painter)—both from Kenya.

Older and still larger recorded specimens include 9 ft. 3 in. (Crawford—N. Nigeria) and 9 ft. 1 in. (Inglis—Kashmir).

Dressed skins of Indian leopards are frequently stretched to over 10 ft. in length.

I believe most leopards, both African and Indian (measured in the flesh), to be above the average size when the total length exceeds 7 ft. 6 in.

Three adult specimens from South-West Africa measured 7 ft. 1½ in., 6 ft. 10 in., and 6 ft. 9⅘ in. respectively.

The Typical Cats

Felis

Felis Linnæus, 1758, Syst. Nat., 10th ed., i, p. 41; genotype *F. catus* Linnæus, 1758, Syst. Nat., 10th ed., i, p. 42. The Domestic Cat.

[1] Pocock (P.Z.S., III, pp. 791–95) exhibited the skin of a leopard from Kanara (S. India) in which the fusion of spots was precisely similar to that in South African specimens; he noted that it remains to be seen if the black leopards referred to by Blanford from Southern India are of the ordinary kind better known from countries east of the Bay of Bengal. In Southern India, however, I had the opportunity of examining a number of black leopard skins, including a live animal, and they were all identical with the true 'evergreen-forest' melanoids from Burma and the Malay Countries. Lydekker (P.Z.S., 1908, I, pp. 1–3) exhibited a leopard skin from Cuddapah, in which the spots showed a tendency towards disintegration into large black-bordered areas.

[2] "Some exhibited melanistic leopard skins from Abyssinia showed a deepening of the ground colour, especially along and on each side of the median dorsal line. In the black skins, of which two were shown, traces of markings were visible in certain lights, and the melanism appeared to be due to a deepening of the ground, not to a multiplication of the spots."—Burton (P.Z.S., 1908, p. 346).

This Abyssinian leopard is a distinct race described by Pocock as *Panthera p. adusta*, (*cf.* P.Z.S., 1932, p. 549).