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THE WILD MAMMALS OF TESO AND KARAMOJA—III

By J. M. WATSON

Suborder: PERISSODACTYLA.

Family: EQUIDAE. Horses, Zebras, Asses.

HIPPOTIGRIS BURCHELLI BÖHMI (Matschie). East African Zebra.

Teso: *Etuko, itukoi*. Karamojong: *Etuko, ngitukoi*.

DISTRIBUTION: Widely distributed throughout western Karamoja from the Kidepo valley in the north to Tisai in the south. As Zebras are very dependent on water they are confined to localities where a permanent supply is available: in 1948 they quickly discovered the new dam in the Loliyakat river and were frequent visitors there throughout the dry season.

DESCRIPTION: The Burchelline Zebras are characterized by a body pattern of broad dark, almost black, stripes on a light background. The range of the race *böhmi* extends south from the southern Sudan, east of the Bahr-el-Gebel, to northern Nyasaland, Northern Rhodesia and the upper Zambesi. As might be expected, there is considerable local variation, not only in the shade of the light and dark stripes, but, to a limited extent, in the pattern also. In general, the widest stripes are the oblique ones—about five in number—on the posterior part of the body, which sweep back alongside the spinal stripe and over the croup. The mane is well-developed; the muzzle and nose-patch are brown; and the greater portion of the ears white.

The stallion measures a little over four feet—13 to 14 hands—at the shoulder and will weigh up to 700 lb. The girth of a male shot by Major Powell-Cotton, standing 48½ in. at the shoulder, taped 61 in. The mare is somewhat smaller; like the horse, she has two mammae.

BIOLOGY: The Zebra, which always appears in the best of condition, is a grass feeder; it favours the fairly open short-grass country which is a feature of much of western Karamoja. I have only observed it in small parties of twelve to fifteen animals, but I am told that it occurs in very much larger herds, especially during the dry weather when the number of available watering places is limited. It undoubtedly appreciates the company of other animals and I have noticed it associating with eland; there is also a record of a lone stallion accompanying a herd of buffaloes.

The Zebra seldom strays far from water, drinking in the evening and in the early morning. In the past, before the Karamojong had spread throughout the district, hunting parties were wont to rely on the Zebra to lead them to water holes. During the heat of the day the animal rests standing or lying down. While feeding, a mare not infrequently takes the lead: Millais (1895) notes that when moving slowly, the herd maintains a crescent whereas antelope keep in a string. Invariably all the animals of a herd will walk with their heads in the up-wind direction. Many observers have recorded the peculiar habit of dust bathing on some suitable rolling ground which is frequented by a herd over a long period.



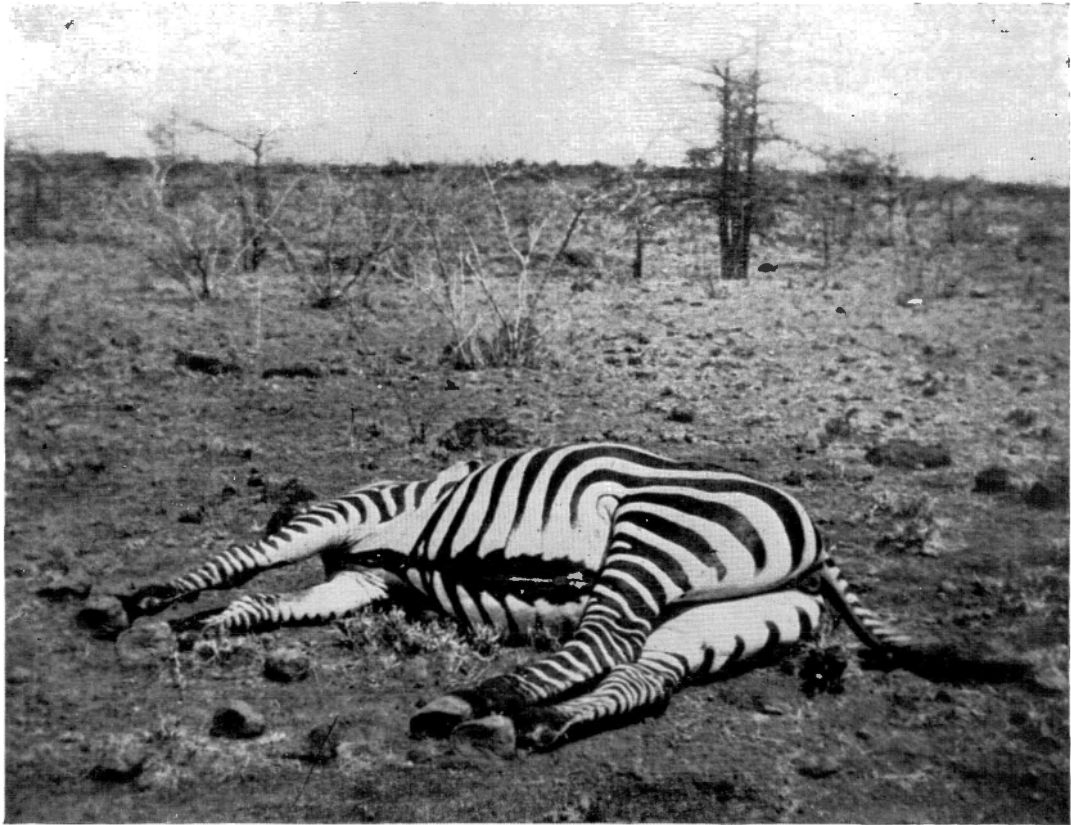
Photographed at Moroto, Karamoja, by J. M. Watson

FIG. 7A
Ant Bear.



Photographed at Moroto, Karamoja, by J. M. Watson

FIG. 7B
Ant Bear.



Photographed in Suk, by C. R. S. Pitman

FIG. 8

Zebra—showing croup and belly markings.

The shrill, almost bark-like, 'qua-ha-ha' call of the Zebra is generally uttered when the animal is alarmed or restless. Zebras seldom call by day, when feeding, unless the herd is disturbed. They are particularly noisy at night, especially when watering, or when lions, their chief and most persistent enemy, are in the vicinity, although during the day they pay little attention to their presence. When alarmed a herd is liable to stampede but, unless very hard pressed, the animals are unlikely to exert themselves for any great distance and quickly return to their normal easy loping pace. Owing to its inability to leap, the Zebra may prove a very serious menace in fenced areas as in its headlong rush it may either take away with it wire and posts or, while endeavouring to scramble on its knees underneath, may break strand after strand in its desperate struggles.

The presence of a pack donkey train in the vicinity of a Zebra herd appears to arouse an excited curiosity among its members. During the day they may merely trot along at a short distance from and parallel to the caravan or, alternatively, stampede past it, an act which often induces the donkeys to do likewise. At night, according to Shortridge (1934), they will collect around camps where donkeys are kraaled when both become extremely noisy and excited, the donkeys endeavouring to break out of their confinement.

The eye-sight and hearing of the Zebra are both good, but its stamina is poor; when wounded it bleeds profusely and soon succumbs to a serious wound. It is an expert in the use of its heels and it can defend itself against all carnivores except the lion. When fighting among themselves, stallions use their teeth. Roosevelt (1910) observed a Zebra run from the herd toward some wild dogs, with its mouth open and ears back; the wild dogs, although apparently not much frightened, got out of the Zebra's way. A wounded Zebra stallion should be approached with caution, as it is liable to use its teeth savagely.

The gestation period is about twelve months.

MISCELLANEOUS: The flesh of the Zebra is rank tasting but is eaten by the Karamojong. The tail is worn as an ornament—*elwado*—on the right arm above the elbow, by a man engaged to be married.

The track, about 4 in. long and 3½ in. wide, resembles that of a horse. It is somewhat narrower and rounder than that of a donkey.

Zebras are easily caught and tamed; training them for serious work, has, with a few exceptions, proved fruitless as they lack the necessary stamina and docility. They cross freely with the horse but the resultant offspring has not been found of any value.

In Kenya, Zebras used formerly to cause much damage to grain crops.

Family: RHINOCEROTIDAE. Rhinoceroses.

DICEROS BICORNIS BICORNIS (Linnaeus). Black Rhinoceros, Hook-lipped Rhinoceros, Rhino.

Teso: *Amosing, amosingo*. Karamojong: *Amosing, ngamosingo*.

DISTRIBUTION: The Rhino is not uncommon in the Kidepo valley especially in the neighbourhood of permanent water, e.g., Korimor, Nawi Adokoch, Lokorimong and Kanagorok (a mineral spring). It also frequents the neighbourhood

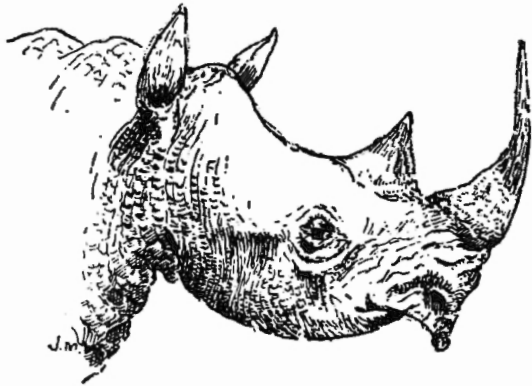


FIG. 9
Black Rhinoceros.

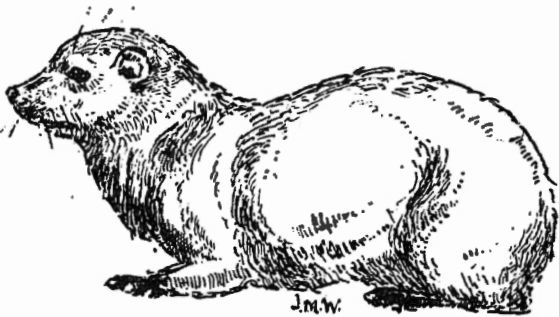


FIG. 11
Rock Hyrax.

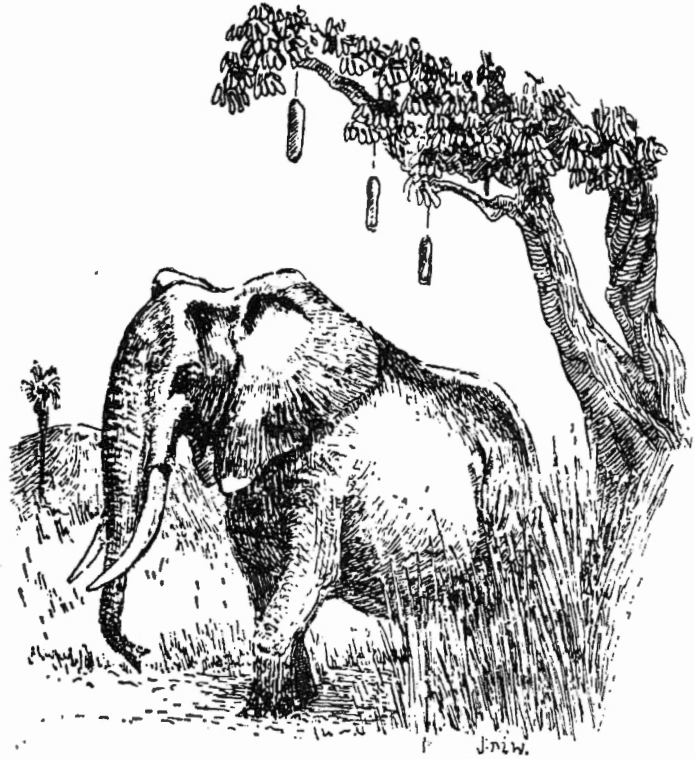


FIG. 10
African Elephant.

of water in eastern Dodoth. Further south it occurs sporadically in such places as Lolelia, Kapeta, Nakodokodoi and Otukei. Occasionally it penetrates into north-east Teso; in 1939 a Karamojong travelling from Usuku to Achwa was pursued and injured by such a wanderer.

Within the last half century the Rhinoceros has retreated rapidly before the advance of man. If place names incorporating the vernacular word for Rhino, e.g., Akaikamosing—the Home of the Rhino—near Nariam, are any guide to its presence in the past, then it was probably at one time abundant throughout the south of Karamoja and in much of eastern Teso as well, a supposition which local opinion upholds. The County Chief of Bokora informs me that, on the introduction of taxation, his father took him, then a mere lad, to the fastnesses of Napak to escape this unpleasant innovation and he well remembers the large number of Rhino then roaming about on the mountain, many of which fell easy victims to the Karamojong spearmen. Two Rhino were shot at the Lia springs above Moroto township during the dry weather of 1928. I have no reason to believe that any Rhino now exist south of the Soroti-Moroto road.

DESCRIPTION: The Black Rhino—only a shade blacker than the white rhino—stands on the average an inch or two over 5 ft. at the shoulder and weighs about 2,500 lb. The total length from nose to tip of the tail is about 11 ft. 3 in. The female is generally somewhat smaller; a specimen at the New York Zoo scaled 1,080 lb. Noticeable characteristics are: the extremely heavy and formidable build, with a girth measurement of about 10 ft; the thick heavy hide devoid of hair except for a few bristles on the margins of the ears and at the tip of the tail; the two horns, anterior and posterior, consisting of an agglomeration of hair-like structures, which are quite unlike the horns of other ungulates; the prehensile upper lip projecting beyond the lower; the absence of canine and incisor teeth in both the upper and lower jaw; and the three almost equal toes on both front and hind feet.

The horns of the female are generally longer but more slender than those of the male. Ward (1935) gives 53½ in. as the record length of an anterior horn; this trophy adorned a female shot in Kenya. A specimen (sex not recorded) from South Africa carried a record posterior horn of 29½ in.; the front horn of this animal was 29 in. long. Such measurements are, of course, very exceptional and the average length in Uganda is not much more than a foot; a pair weighing ten pounds would be a satisfactory prize. There is considerable variation in the size of the rounded base of the horn, and abnormalities, e.g., the horn protruding forward like the bowsprit of a ship, or the development of a small third horn behind the posterior horn, are not unknown. A five-horned Rhino is on record. Specimens have been shot in which only the pedicles of the horns remain, suggesting that the horns may in some instances be broken off accidentally. The race *holmwoodi*, to which the Rhino of Uganda was at one time assigned but which is now considered a synonym of *bicornis*, was based upon two frontal horns of 41 in. and 42 in. in length, characterized by their thinness, the small size of the pedicles and a generally compressed appearance.

BIOLOGY: The Rhino undoubtedly prefers its own company to that of its fellows and demands only to be left alone. It is usually met singly, or sometimes in a small family party, usually a cow with a very young calf or a cow with a calf several years old. The ubiquitous tick-bird or ox-pecker—*Buphagus*, a member of the starling family—is invariably in attendance, ready to break into hissing screams on the first approach of danger. The Rhino is a browser, feeding on shoots, leaves (including those of the cotton plant if available) and roots. Percival (1928) mentions its particular fondness for the wilted branches of one of the euphorbias. Observers who have watched it feeding have commented on the use to which it puts its prehensile lip to pluck its food, the fastidious manner in which it selects the choicest tit-bits, and the noisy champing of its jaws as it masticates its meal.

It is an animal of regular habits and if food and water are sufficient it is quite content to remain in a restricted area where it will develop a network of well beaten but poorly graded tracks, about 20 in. wide, from watering place to feeding grounds. Needless to say it is inadvisable to camp on or near one of these paths even if it appears old and seldom used. During the heat of the day the Rhino selects some thicket, or the shade of a solitary tree, and rests, head down-wind and ears constantly twitching, either standing, lying down, or stretched full out on its side: when actually asleep, it snores loudly. In the late afternoon it moves towards its water hole, possibly feeding *en route*; if delayed, it will make up for lost time by travelling at a good trot. It drinks after sunset and, if necessary, will dig for water to a depth of a foot or more, throwing out the sand between its hind legs like a dog. After drinking it becomes sufficiently sociable to indulge in mild play with its neighbours. Percival (1928) records that they gambol “in sheer lightness of heart, romping like a lot of overgrown pigs”. These gambols are accompanied by much grunting and squealing. Rhinos also enjoy a thorough scratching of the hide against a tree or suitable rock, particularly after a good wallow in the mud. Salt licks are visited if accessible, the horn being used to plough up the saline earth of which large quantities are chewed and not a little swallowed. As dawn approaches, the animal moves off once more to its daytime resort which may lie some miles from the watering place.

The Rhino possesses an excitable and inquisitive nature and at times, especially if rudely awakened from its midday nap, may indulge in stupid and blundering acts of aggression. Its eyesight is extremely poor (Pitman suggests that the horns may interfere with its vision) and a so-called ‘charge’ may be nothing more than a well-intentioned attempt to escape up-wind. When charging, it utters a steam-engine-like snort and travels at a clumsy gallop of about 15 to 20 m.p.h., a pace which it can sustain for a considerable distance. The tail is held aloft, and the head, too, is held high and is only lowered at the critical moment of impact. As an example of the power behind such a charge it is recorded that a Rhino, attacking a caravan of slaves, chained neck to neck, struck the centre man and broke the necks of the other twenty-one unfortunates by the shock of the impact alone. It is, apparently, a matter of considerable ease to avoid a charge by the simple expedient of stepping aside at the last minute. The Rhino seldom makes an attempt to hunt the object of its anger but

endeavours to blunder its way to safety as quickly as possible. The cries of a number of persons shouting together are sometimes sufficient to induce an attacking Rhino to turn aside. There are numerous recorded instances of Rhino charging camp fires at night.

The Rhino usually resorts to well used dunging places although this habit is not so well marked as it is with the white rhino. The voidings, which are not unlike those of the elephant, are scattered by the hind legs, although not necessarily immediately after evacuation. The area around the dunging place is not infrequently scored with the horn. The animal also has the habit of micturating against a selected rock, which acquires as a result a shiny whitish appearance.

According to Captain H. B. Potter, Game Conservator, Zululand, the gestation period is between eleven and thirteen months, with three years elapsing between each calf. Another authority, Vaughan-Kirby, places the gestation period between sixteen and eighteen months. No records are available from zoological gardens as the Rhino has not as yet bred in captivity. Percival observed a cow suckling her calf lying down, in the manner of a sow.

Captain Potter, writing in the *Field*, comments on the fact that all adult Rhinos, both male and female, develop a sore on each side of the body near the shoulder blade which increases in size during the mating season and discharges quantities of blood and fluid. In due course the sores dry up but open again during the following year. In young animals there is external evidence of these sores but they do not commence to discharge until puberty is reached. Captain Potter suggests that this phenomenon is associated with the sexual cycle, as the odour of the discharge appears to be particularly attractive to the opposite sex and may therefore assist in bringing the male and female together.

The calf reaches maturity at about seven or eight years. It will show spirited determination to defend the corpse of its mother when shot. Observers have noted that the Black Rhino calf invariably follows its mother, in contradistinction to that of the white rhino, which, preceding its dam, is guided in the direction in which she wishes it to go by the judicious use of her horn.

MISCELLANEOUS: The track of the Rhino is quite unmistakable: the three-toed hoof leaves a trefoil design about 8 in. in diameter.

The horn is valued in the East as a reputed powerful aphrodisiac. In the past it was held that a cup made from Rhino horn would split in two if poison were poured into it, while John Evelyn mentions a well in Italy which was purified by the addition of a horn. The hide is valued by the Karamojong for the manufacture of sandals.

It is probable that young Rhinos occasionally fall prey to lions; a case is on record, supported by photographs, in which a full-grown female Rhino, leaving a river after drinking, was seized by the left leg by a crocodile and, after a determined struggle, finally pulled into deep water and drowned.

The Black Rhino has a rooted aversion to crossing rivers.

Order: PROBOSCIDEA

Family: ELEPHANTIDAE. Elephants.

LOXODONTA AFRICANA AFRICANA (Blumenbach). African Elephant.Teso: *Etome, itomei*. Karamojong: *Etome, ngitomei*.

DISTRIBUTION: At the beginning of the century, Karamoja District was renowned throughout East Africa as the Mecca of the ivory trader and elephant hunter, the Elephants being distinguished for their bodily size and the weight and quality of their ivory. Bell (1923), who has described many of his experiences in Karamoja, returned from his first *safari* there in 1906 with 17,000 lb. of ivory. Darley (1926) found Elephant in sufficient quantity in northern Dodoth to induce him to spend a year at Tshudi-tshudi, close to the present Kaabong, although he found on his arrival there—about 1907—that bands of Swahilis, Egyptians, Greeks, Arabs and Baluchis had already greatly reduced the Elephant population in that area. At Mani-mani, not far from Kangole, there was another noted trading centre which Bell describes as being of considerable size; the notorious Shundi, a Kavirondo by birth, who commenced his commercial life as a slave at the Coast, was the recognized ruler of this town. In passing, it was one of Shundi's slaves who killed, on the slopes of Kilimanjaro in Tanganyika, an Elephant whose larger tusk weighed 235 lb.

Among the hunters must be included the Karamojong themselves. Encouraged by the exchange rate of one cow for 25 lb. of ivory, they were undoubtedly responsible for the slaughter of countless Elephants. Powell-Cotton (1904), who travelled through Karamoja in 1903, records that a cow could be procured in Kenya for about Shs. 50/- and that 25 lb. of ivory were valued at ten guineas; the explanation for the attraction of Karamoja to traders of every race, creed and colour is thus not far to seek. As tusks became scarcer, however, the Karamojong progressively increased the price of their ivory until it reached the impossible figure of ten cows for one large tusk. The traders reacted to this threat to their livelihood by assuming the role of armed robbers, taking by force what they could no longer buy and aiding and abetting one village to raid another for its store of buried ivory. "The hitherto peaceful looking trading camp", writes Bell, "gave place to large armed *bomas* (stockades) surrounded by high thorn fences. Everyone—trader or native—went about armed to the teeth."

The gradual expansion of the Administration (a touring officer was appointed in 1911), coupled with the marked reduction in the supply of ivory, rapidly resulted in the establishment of a more peaceful way of life throughout the District and at the outbreak of war in 1914 it was evident that the heyday of the hunter and trader in Karamoja was over.

The herds of Elephant have gone, never to return: their place has been taken by countless head of stock, the direct descendants of those innumerable cows brought into the country by the traders to tempt the Karamojong to part with their ivory. Only the agriculturist, soil-conservationist, and game-lover regret the exchange!

The following localities appear to have been the three chief Elephant foci in Karamoja :

(1) *The Salisbury-Gedge-Opeta lake-system*, particularly the less-inhabited eastern part. Elephant from here reached as far as Kadam mountain, particularly the valleys of Namalu, Amaler and Akokor. *The Handbook of Uganda* (1913), describing the route from Kelim (Greek River) to Tshudi-tshudi (Kaabong), mentions: "Elephant frequently to be found near Kakora (i.e., Akokor) River, crossed about $\frac{1}{2}$ hour before reaching camp (at Kwatabok). No natives." Bell, while hunting west of Kadam, writes: "Here we were face to face with such a gathering of Elephant as I had never dared to dream of even. The whole country was black with them . . . some of them up to their knees in water, and when we reached their tracks the going became very bad . . . (my guide) made me kill seven, before sundown stopped the bloodshed. I expected to do well on the morrow, but when it came, beheld not an elephant in sight." In the wet weather, Elephant extended their range well into Teso. A well-known administrative officer who was stationed at Soroti in 1914 told me he shot his 'two' at Gweri before lunch. Even as late as 1933 a few still remained to pay periodic visits to the *shambas* of peasants in the Malera neighbourhood. The members of these herds were of a particularly vicious nature as they had to contend annually with the dry weather influx of the Karamojong and his stock to Tisai, Opeta and the Kelim river.

The valleys at the foot of Napak were also visited, e.g., Duol Nabwaliapal-okodakamarr, while the wells of Lothar were a favourite haunt. There are one or two Elephant paths on Kadam but I am informed that very few animals investigated the higher altitudes of Napak.

(2) *The banks of the Turkwel or Suam river*. During the wet weather, Elephant followed up the Kanyangareng river and reached almost to the foot of Mt. Moroto. They were not known among the valleys at its base probably because these were, and still are, important watering places. A hunter who visited the Turkwel in 1912 told me that Elephant were by no means common there, even then. Amongst the Elephants which used to follow up the Kanyangareng river were two small herds of a reputed dwarf Elephant which normally resided in the Kerio valley in Suk.

With regard to these two foci, the present position is briefly told. There are now no resident Elephants in Teso and none in Karamoja south of the Soroti-Moroto road, although towards the end of 1948 a party of Elephants from the north paid a brief visit to the foot of Napak and then continued south to the east of Lake Gedge.

(3) *The Kidepo and Laruss river-systems* in the north-west. This undoubtedly was one of the chief Elephant hunting-grounds, the hunters and traders having their headquarters at Tshudi-tshudi. During the rains the Elephants extended their range eastwards, some passing north of the Morungole massif down into Turkana towards Zingote, others moving south-east to Lomej and Taan and thence up to the Kapelepolot as far as Kalapata and Timu, or southwards down the innumerable river systems, e.g., Lokalath, Lolelia, Kapeta,

Kailong, Koputh and Nakodokodoi, to Nyakwai, northern Teso and almost to Kangole. Recently a dam was constructed about 15 miles south-west of Kangole close to the Moroto-Soroti road, at a place called Lokiporangatome, a word which can be suitably translated as the Elephants' Wallow—an excellent name for an East African inn! This was a favourite haunt of these animals some forty years ago.

To-day, it would be difficult to give any estimate of the number of Elephants which actually reside in Karamoja throughout the year. There is probably considerable variation from year to year, depending on the amount of water and food available. In March 1948 I made a fairly extensive tour of north-west Karamoja between the Sudan border and Lomej and along the north foot of Morungole, when it was evident that there were only a few Elephant about. There were reports of two between Lonyili and Laruss, while a small party of bulls was encountered feeding on borassus palm fruit on the banks of the Kidepo close to the Sudan border. Their watering place, Lokudul, is actually in the Sudan. In the hills between Taan and Lokomait two or three other small groups were observed but nowhere were there any indications of a large assemblage. We recorded only seventeen, all told. The 1947-48 dry season was unusually long and it is doubtful whether there was sufficient food and water in this neighbourhood at the time of our visit to support a large body of Elephants; it is probable that the few that were then in Uganda were visitors from a more attractive locality on the lower reaches of the Kidepo well inside Sudan territory. I am informed that a small party of males spent the 1947-48 dry season in the neighbourhood of Otukei, and it is very possible that a few individuals remain behind annually in the vicinity of Rom and the Nangeya hills.

When the rains have fully broken in May and June, the southward expansion, restricted in range but in many respects similar to that already described, commences. Both in 1946 and 1947, Elephant reached as far south as the dam at Lorengikipi; in other years they have been recorded from north-east Teso. During the severe drought of 1928 a very thin and aged cow, obviously dying, was finished off by a Teso about a mile from Katakwi near the Nariam road.

It is almost impossible to give any estimate of the numbers involved in this southward movement; food and water must surely be the limiting factor. In 1947 I received a report of a herd of about thirty which crossed the Kotido-Labwor road in the neighbourhood of Loyoroit on its way south and subsequently recrossed it on its return to the north later in the year. The number which resides during the wet weather in the north-west corner of Karamoja is substantially larger than this figure, but it is evident that it is in no way comparable with the countless host which roamed throughout this quarter some fifty years ago.

DESCRIPTION: Average shoulder height of the bull, 10 ft. 6 in.; giants of 11 ft. and more are not unknown, but rare. Weight: male about 6 tons; female, 4 tons. Colour: uniform grey, the shade varying somewhat between individuals.

The large head, with noticeably convex forehead, consists for the most part of an immense development of air cells in the exterior wall of the skull

which surrounds the small, ten-pound brain. This unusual development provides the necessary superficial space to attach muscles of sufficient size and strength to support the skull, so heavily weighted with tusks and trunk. The brain itself is about $3\frac{1}{4}$ in. wide and 12 in. long, the brain-case increasing but little in size during growth. Above and slightly behind each eye there is a small gland—the temporal gland—which Selous associates with perspiration, as this part of the head always appears damp and black after heavy exertion in the sun. Steinhardt, on the other hand, has noted that these glands are always moist during the breeding season; the more modern view, however, discounts any association between the activity of the temporal glands and the onset of the *must* period of the male Elephant.

The enormous ears, very much larger than those of the Indian elephant, measure up to $6\frac{1}{2}$ ft. in vertical diameter and $4\frac{1}{2}$ ft. in horizontal diameter. They have a spread, when both are fully expanded, of over 10 ft. The shape, size and the extent of the turnover flap at the top varies considerably between individuals but these distinctive characteristics are not now considered valid for the establishment of different races, e.g., *knochenhaurei*, the Masai Elephant, with small ears forming an almost perfect equilateral triangle; *oxyotis*, the Sudan or Abyssinian Elephant, with very large ears, forming a long and acutely pointed triangle. When not in use, the ears lie flat against the body; when an animal is about to charge they are alternately expanded and closed. A calf can make a praiseworthy attempt at cocking its ears.

The tip of the extremely sensitive trunk is provided with two finger-like processes, and is put to a variety of uses, including the gathering of leaves and fruit for food, and the testing of the air for the scent of enemies, food and water, both near at hand or at a distance. It is possible for an Elephant to try the wind to a height of 15 ft.: "As one watches the great beasts", writes Roosevelt (1914), "the trunks continually appear in the air above them, uncurling, twisting, feeling each breath of air."

During courtship the bull and cow caress one another with their trunks, intertwining them in a sort of love embrace. The trunk is also used by the dam to guide her young and, on occasions, as an instrument of correction. When bathing, it is employed to squirt water over the body; when worried by flies and heat, to squirt dust. According to some authorities the trunk can be inserted into the mouth to draw up water for a shower bath from a special water storage compartment of the stomach, measuring two feet in length and a foot in diameter and having a capacity of about ten gallons. Court Treatt, in his book *Out of the Beaten Track*, states that he has seen Elephants using the contents of this internal tank for bathing and has observed the resulting wet patches on the ground at some distance from water. He adds, "I can only imagine that they extract the water from themselves by evacuating it from the sac to the mouth, sucking it out with the trunk and then squirting it over their bodies." This liquid is normally clear and tasteless, though slightly warm.

The heavy, ponderous body, with a marked depression between the shoulders and hip, is borne on column-like legs, the solid bones of which possess little or no development of angulation: the limbs are designed for weight-carrying but are not made for speed. The Elephant is almost digitigrade, that is to say it

walks on its toes, which are five in number on both front and hind limbs, but these are encased in, and supported by, a mass of spongy tissue which enables it to tread extremely softly and without noise. Only four of the five toes of the front limbs carry nails, which are curved into an elliptical saucer-like shape, although a vestigial fifth nail is sometimes found; only three of the toes on the hind foot have nails. Foetal Elephant specimens have five nails on the fore feet and four nails on the hind feet. The soles of the front feet are rounded, measuring in large animals 22 in. from toe to heel; those of the hind feet are comparatively narrow. W. H. Hale, writing in 'Nature in East Africa', No. 3, records that of nine Elephants shot on the Tana River, the soles of the forefeet of eight animals were exactly 20 in. across from toe to heel and did not vary a fraction. The ninth, which carried the largest tusks—over 100 lb. each—measured 19 in. across. He adds that well-defined corrugations on the sole generally indicate a good bull though, according to Pitman, the harder the ground surface in an Elephant's normal habitat, the more defined are the corrugations on the sole of the foot.

The teeth of the Elephant are entirely different from the normal mammalian dentition. The upper incisor teeth are reduced to two large ever-growing curved tusks; canine teeth and lower incisors are wanting. The tusks consist of solid dentine, enamel being found only at the tips, and are preceded by a pair of milk incisors, shed at about six months. The retention of the milk incisors along with the permanent tusks may give rise to a so-called four-tusker, although injury and disease can both lead to the bifurcation of a tusk while in the process of development. A particularly fine specimen of a four-tusked Elephant was killed in the Kivu Province of the Belgian Congo in 1947: the tusks weighed about 50 lb. each. Other ivory abnormalities, which include a seven-tusked specimen (from a single socket) shot in Uganda, have been recorded. Dollman (1941), in the *Standard Natural History*, has described the mode of succession of the cheek teeth, which is unique among land mammals. "The teeth (usually six in number) are never all in place at the same time, there being a gradual forward movement of the whole series from below upwards and forwards, so that only one or portions of two teeth are ever in use on either side of both jaws at once. As the front teeth become worn away and cast out, so the development of those behind goes on. The cheek teeth appear to represent three milk molars in front and three molars behind."

One of the heaviest tusks ever recorded is a single tusk weighing 250 lb. which was exhibited for some time at the Zanzibar Customs House. A pair of 10 ft. 4 in. tusks from Kilimanjaro was sold in Zanzibar in 1899; they weighed 235 lb. and 225 lb. respectively, and their commercial value was just £1,000.

It is presumably this pair, though the weights and lengths are somewhat different, which is referred to in the *Bulletin of the New York Zoological Society* (Vol. 38, No. 2), as follows:

"The largest Elephant tusks of which there is any record were taken from an old bull killed with a muzzle-loader by an Arab slave at the base of Kilimanjaro, in 1898. They weighed 228 and 232 pounds, a total of 460 pounds. . . ."

“According to the slave, when standing, the animal's tusks almost reached the ground. He was not a big Elephant, but had high shoulders and sloped away in the back “like a hyena”, the kind of Elephant the old Arabs in Zanzibar always said carried the heaviest ivory.”

“As to whether these are the largest tusks ever secured from an Elephant we cannot be quite sure. Burton, in 1872, spoke of hearing of a pair, weighing approximately 280 pounds each, that had been sent from Mozambique to the King of Portugal, and Von Höhnel tells us that his ivory-trader guide knew of a tusk which weighed 264 pounds.”

The longest pair on record was obtained near Rutshuru in the Belgian Congo in 1943. The measurements of this pair are: length 350.5 cm. and 303.4 cm. (11 ft. 7 in. and 9 ft. 11 in.); girth 51 cm. and 51 cm. (20 in. and 20 in.); weight 68 kilos and 61.5 kilos (150 lb. and 135½ lb.). Another very long pair, 11 ft. and 11 ft. 5½ in. long respectively, with a combined weight of 239 lb., is in the American National Collection; they are comparatively slender with a maximum girth of 18½ in. A single tusk in the British Museum, weighing 226½ lb., and measuring 10 ft. 2½ in. in length, has a girth of 24 in.

I have few records of tusk weights from Karamoja; a ninety-pounder was shot near Kotido some years ago, while a seventy-pounder was obtained in 1947 in the neighbourhood of Lolelia.

Cow Elephants carry much smaller tusks, ranging between 10 and 15 lb. in weight; those of the record pair (from a cow shot in Uganda) weigh 52 lb. and 46 lb. respectively, and are now in the British Museum. Cow ivory is not always readily distinguished from that of a young bull. Mr. A. L. Butler, one time Game Warden to the Sudan Government, in a note appearing in *The Game Animals of the Sudan* by Captain H. C. Brocklehurst, states that the average weight of a cow tusk is 10 to 12 lb., but weights up to 18 lb. are not uncommon: a tusk of 20 lb. is exceptional. Cow tusks are normally readily distinguishable as they have virtually no hollows. A cow tusk should never be mistaken for that of a bull, though some small bull tusks might be mistaken for cow ivory.

The two mammae of the female Elephant are situated between the front legs and are curiously human in form and position. Sometimes a baby Elephant is not tall enough to reach its mother's mammae, and may then die of starvation. The testes of the male are abdominal.

BIOLOGY: The Elephant is gregarious and may be found in a small family party of a bull and a cow and calves of different ages or in a large herd of up to a hundred or several hundred individuals, often consisting entirely of cows and calves, or possibly a large collection of family parties. Bulls tend to form small groups but the old solitary bull is frequently encountered. In the rainy season when most of the pools are full of water, large Elephant herds may break up into smaller units, foregathering again in the dry season when the number of watering places is restricted.

The diet of the Elephant is very varied: leaves and bark of many trees and bushes (in parts of Karamoja species of *Combretum* appear popular); aloes and sansevierias; wild fruits, including those of the Desert Date (*Balanites*) and the

Borassus Palm ; various roots (in Karamoja particularly those of *Dolichos lupiniflorus*)¹ ; sweet potatoes ; seed pods, including those of the groundnut ; grasses, bamboo shoots, maize stalks, heads and stems of sorghum, plantains and mangoes. Some unusual foods, e.g., fish and freshwater mussels, have also been recorded. It is estimated that the Elephant requires some 600 lb. of vegetable matter each day. Branches of trees are grasped and broken off with the trunk and are then drawn through the mouth to detach the bark and leaves, which are eaten. Small trees and bushes are uprooted completely, the Elephant falling to its knees if it can obtain a better purchase in this position. Larger trees—Lyell records one having a circumference of 52½ in. below the break—are broken clean off by a combination of butting and pressing actions of the forehead. Grass is pulled up by the trunk and the roots beaten against the knees to remove earth. According to Selous, the Elephant uses its forefeet when digging for roots, employing the tusks to prise up and break the root when laid bare, and pulling out the tapering end with its trunk. Elephants have been seen standing on their hind feet to grasp food out of normal reach. They are particularly partial to saline earths and it has been suggested that frequent visits to salt deposits may assist them to keep their mouths free of leeches.

Cows and calves appear to require a drink daily but old bulls can remain for a day or two without water, the exact length of time depending largely on the prevailing weather conditions. Watering, which is a leisurely and noisy affair accompanied by much wallowing and water squirting, usually takes place at night and may be prolonged for an hour or two. The Elephant will dig with its forefeet in sandy river beds for water, completing the operation with a gimlet-like action of the trunk ; it discards the sludge drawn up before clean water is reached. When fouled and dirty water only is available, it will endeavour to obtain a cleaner supply by excavating alongside, but it does not appear to make any effort to preserve its water supply from pollution. Steinhart states that Elephant when thirsty are very prone to charge and that they are therefore best left alone if discovered standing around water.

During the heat of the day Elephants rest in some spot selected for the heavy cover it provides. There the bulls become extremely drowsy and unwary, and not difficult to approach, though cows remain more on the alert, continually testing the breeze with their uplifted trunks. With regular forward twitchings of the ears (believed to act as a thermostat) they sleep and doze, either standing or, more rarely, lying down ; if an animal chooses the latter position, a conveniently placed anthill may be utilized as a head rest. Nightingale (1948), describing his experiences with Elephant in the Southern Sudan, writes, "I then approached the group . . . and when within twenty-five yards a three-quarter grown bull deliberately lay down, and without more ado fell asleep. He lay on his side, with his forelegs crossed and tucked in, and as he breathed out he blew bubbles through his lips in a most comical way. Every now and then he flapped a huge ear to brush off the flies." And again, "She must have been merely sleepy, for as we approached she lay down, and within five minutes her loud and prolonged snores left us in no doubt that she was sound asleep."

¹ I am greatly indebted to members of the Agricultural and Forest Departments for their assistance in naming many of my botanical specimens.

In search of food and water the Elephant will cover great distances. It is a tireless walker and between watering place and feeding ground it develops a series of paths which are remarkable for their smoothness, freedom from obstacles, and easy grade. Year in and year out, herds will follow these well-worn tracks, the rocks and boulders along the route becoming polished by the traffic of countless seasons. When undisturbed the Elephant will travel at some six or seven miles an hour, but if thoroughly alarmed it is well able to increase this speed to ten miles an hour—a pace which it can keep up for a number of hours. When charging or stampeding from danger it may reach a speed of twenty miles an hour but it cannot maintain this for long. Despite its great weight, it can move almost without noise, although when undisturbed it tends to feed desultorily as it walks, the snapping of branches indicating its whereabouts. According to Melland (1938) the cow takes particular care to teach her calf not to litter the path with refuse from these wayside snacks. As Pitman says, in the Annual Report of the Game Department of Uganda for the year 1934 (paras, 124-127), the swimming capacity of the African Elephant is a subject of considerable controversy:

“It is well known that Elephants traverse shallow waters such as the Albert Nile, parts of the Victoria Nile, and the Kazinga Channel in the Western Province, by walking partially or wholly submerged, in the latter case the tips of their trunks showing. But authenticated instances of swimming are very rare.”

“In the course of the visit of the Parliamentary Delegation to the Murchison Falls, during the upstream trip a large bull Elephant was seen apparently swimming the Nile ahead of the steamer. The river at this place is about four hundred yards broad: unfortunately everyone was so interested in the unusual spectacle that no soundings were taken to ascertain the actual depth.”

“There were three different phases in the mode of progression repeated mechanically and precisely which do suggest that the creature was not merely walking along the bottom. From the three separate exposures of parts of the body made in regular sequence it seemed that while completely submerged, and presumably swimming, the Elephant feeling the necessity for taking a breath of air heaved itself upwards towards the surface which resulted in the exposure of the top half of its head. Next the body again disappeared completely from view to be followed by the sight of a few feet of the trunk thrust above the water at an angle of 45°, and exposed for several seconds. The trunk in its turn disappeared, but instead of being withdrawn along its own axis, was used with a downward sweep to help propel the creature. This driving thrust was sufficient after the disappearance of the trunk tip to expose a tiny portion of the top of the head for a few moments. After this had disappeared beneath the water, the process as just described was repeated.”

“The Elephant while helpless in the water had evidently heard the thud of the stern-wheel, so that when it eventually emerged on the bank it swung round in menacing fashion with huge ears forward facing the

steamer. Then having had its look it slowly turned, climbed the bank and disappeared.”

When feeding, a herd draws attention to itself by constant snapping of the vegetation, trumpet-like blowings through the trunk, shrill cries from the calves, and by intestinal rumblings which, audible 150 yards away, can, according to Blunt (1933), be stopped at will.

Of all animals, the Elephant possesses the keenest sense of smell and with a steady wind in its favour it is probable that it can locate a human being almost a mile away. Elephants when feeding pay no attention to noises around them, but when at rest are keen of hearing and Lyell notes that the breaking of a stick or dried pod is audible to them when fairly close. Although at fifty yards or so they appear unable to distinguish stationary objects by sight, yet Pitman believes them to have excellent eyesight and considers that it is only because of the position of their eyes and their height above the ground that they are unable to focus near-by objects.

The Elephant, although peaceful, is nevertheless a very temperamental subject and its reaction to the sudden appearance of a human being is always uncertain. A bull displaced by a younger rival, an animal exiled from the herd owing to its evil temper possibly due to past wounds, tuskless bulls and cows—these are frequently of a particularly vicious nature—are all prone to charge unprovoked. A cow with a calf is also always ready to defend her offspring. Selous has vividly described the charging Elephant. The trunk is first raised in an attempt to pick up the scent and at the same time the animal, continually cocking and lowering its ears, looks from side to side for its enemy; the tail in the meanwhile is held erect. When the actual charge begins, seldom from a distance greater than a hundred yards, the trunk is dropped, the ears extended fully (though Blunt (1933) states that a cow charges with her ears folded back), and silently or with short sharp screams of rage, the animal makes for its adversary. The Elephant generally kills outright. Cleland Scott, writing in the *Spectator*, 14th May 1948, says: “What usually happens is that they seize you with their trunk and break you across their tusks as we snap a match, or else they bang you against some handy tree. Other tricks in their repertoire are to kneel on you or skewer you with their tusks.” A stampede by a herd, sometimes described as a mass charge, is invariably a hasty attempt to retreat to safety. Melland (1938) states that a moving herd if met face on may stampede towards the source of its fear, but is more likely to perform a complete about turn and go back in the direction from whence it came. After a short while the herd will perform another about turn and continue in the original direction of its march. If disturbed from the rear, it will continue to move on its original direction at an enhanced speed and may continue for fifty miles or so without a halt.

Mention must be made of the peculiar sagacity of the Elephant which in several respects is of a particularly human quality. The following examples may be of interest. Unlike the majority of wild animals, Elephants normally (but not always) shun a dead comrade or a decaying corpse. In the days when Europeans were a comparative rarity in Central Africa, early hunters stated that

the Elephant was able to distinguish between the scent of a European and an African, associating danger only with that of the latter. One observer has noticed a peculiar form of ritual adopted by Elephants, when meeting: it includes the throwing up of the trunk, a lifting of the forelegs, and bowing. Another has observed a male and female, with trunks uplifted, making very obvious attempts at kissing. That the Elephant will on occasions endeavour to bury under the cover of leaves and branches its human victim is well authenticated and there are cases on record of persons who have escaped from their leafy tombs to tell the tale. Powell Cotton (1904), while travelling between Munyen and Moruasokar in Turkana, came across a twisted spear and the remains of a badly mauled man beneath a heap of boughs. The Elephant had first buried the body and then turned to wreak its vengeance on the spear which had wounded it. Powell Cotton adds that the Elephant is also said to bury its lion victims. In the Sudan, in 1947, Elephants buried under branches, vegetation and a little earth a comrade which had been shot.

It is well established that a wounded Elephant is frequently assisted from the scene of danger by its comrades and an interesting example of this solicitude for the injured is recorded from Karamoja by Major Foran in his book *Kill or be Killed*. Foran severely wounded a bull Elephant which was immediately surrounded by a group of cows, a pair taking up position on either flank of the unfortunate animal. By concerted heaving and pushing they managed to keep the dying Elephant on the move for three days, during which time they travelled far and fast. Finally the old bull, reaching the end of his endurance, fell down dead but for an hour the faithful cows made every attempt to raise him to his feet again. At last, realizing he was now beyond elephantine aid, they turned slowly away, halting now and then to look back on his prostrate body.

Whether there is or is not a well defined breeding season among Elephant communities is a subject of considerable controversy. Some authorities state that not only is breeding markedly seasonal but that it is also confined to recognized breeding localities; others aver that calves are born throughout the year. Brocklehurst (1931) gives September-November as the breeding season for Elephants in the Southern Sudan. It is known that the male Elephant is subject to sexual periodicity, but present knowledge of the factors which produce the breeding condition is very limited. External influences—climate and food supply—are likely to play an important part and if this is so then clearly a breeding season, possibly of wide limits, is a necessary corollary.

During the act of mating, the female thrusts her trunk backwards and interlaces it with that of the male. The gestation period is between 20 and 23 months: according to Lyell it is 22 months for a male calf and slightly less for a female. There is some doubt as to whether the cow retires from the herd to calve; possibly the herd remains nearby during the labour period and then leaves the cow until the new-born calf can keep up with it: this it can do about a week or so after birth. W. G. Adam, writing in the *Field* of 20th June 1931, records an instance which suggests that the cow of the Indian elephant may spend a considerable time in labour, possibly up to four or five days, the whole time being spent on her side. Pitman believes that normally the cow Elephant leaves the herd to calve; but that occasionally calving takes place with the herd around.

He came across such a case in Acholi in 1926—the cow had evidently been in labour a few days with a very large herd standing about her by day. This has been described, for the Indian elephant, by Sanderson in his *Wild Beasts of India*. At birth, the calf measures about 2½ ft. at the shoulder and usually weighs less than 300 lb.: it suckles with its lips and not with its trunk. Elephant twins have been recorded. Pitman considers that the growth in height is approximately 4 in. a year, a 4-5-year-old youngster being about 4 ft. high. The African Elephant 'Jumbo' measured 4 ft. on arrival at the London Zoo: in the next seventeen years it grew a further 6½ ft., which is at the rate of 4½ in. a year.

The weaning period is in the neighbourhood of two years, puberty being reached between eighteen and twenty years.

The family spirit appears to be well-developed and the bull, though not strictly monogamous, is constant to its chosen mate; or possibly it would be more accurate to say that it is faithful to the cow by which it has been selected, for according to Melland (1938) the cow will warn off rivals when the bull is in the breeding condition. Cows with two or more calves of different ages are frequently encountered.

The cow, unlike the bull, expresses great concern for her young and will freely endanger herself for its safety or to retrieve it when missing; she will normally adopt an orphan calf only provided it has already been weaned, but Captain Salmon has seen adopted orphans being given suck. She expends much time and trouble in introducing the calf to the numerous pitfalls of life—this may be literally true for there is some evidence to suggest that where pit traps are in general use she endeavours to warn the calf of that particular danger—and when she desires to communicate with it she employs a special low call. African Elephants have not, however, the intelligence to help a calf out of a pit, should it fall in.

The cow is a regular but slow breeder and the interval between calving is between 2½ and 3 years. The Elephant is not so long-lived as is often imagined—the oldest authenticated animal is 80 years old. It is probable that most Elephants do not live longer than 60 years.

According to the Karamojong, lions occasionally take toll of the very young. Their method of attack is to maul the calf as much as possible before the dam comes to its rescue and then to beat a hasty retreat. If the calf is so severely wounded as to be unable to keep up with the herd, the cow sooner or later reluctantly leaves it to its fate, and the lions, awaiting this moment, close in to complete the killing. There are also records of adult Elephants being slaughtered by lions; in one instance two lions achieved a kill while in another four were necessary to complete the job.

MISCELLANEOUS: The massive droppings, consisting of semi-digested fibrous material, can hardly be mistaken for those of any other animal; when the diet is largely the fruit of the *Borassus* palm, the dark brown shiny pieces of the skin are very noticeable. The theory that Elephants are instrumental in spreading this palm appears to me to be well-founded; I have seen small

pockets of it near isolated waterholes visited by Elephant, and have noted the stones of the fruit in droppings fifteen miles from the nearest grove.

Elephant dung is odourless but the smell of the micturations is extremely powerful. When undisturbed, Elephants stand to evacuate; when persistently hunted and kept on the run, they are apt to suffer from acute diarrhœa.

To many Africans the flesh of the Elephant is very welcome. Selous considered it well-flavoured despite its extremely coarse-grained nature. Some Europeans have found the trunk, when properly cooked, palatable enough; others favour the foot, or the flesh from the hollows above the eyes.

The Karamojong hunted the Elephant both with wheel-trap and spear. The former was set over a shallow hole in a much-frequented path with a strong noose of rawhide rope, to the other end of which was attached a heavy log, placed immediately above it. The whole contraption was covered with a layer of grass. An Elephant placing its foot in the hole was immediately caught by the noose which was prevented from slipping off the leg by the firmly fixed wheel trap below. The heavy cumbersome log soon tired the ill-fated animal which, in a state of exhaustion, fell an easy prey to pursuing spearmen.

The legend of the Elephant-cemetery appears to derive from the fact that the carcasses of Elephants which have died from natural causes are seldom found. Elephants sometimes meet their death by drowning, some undoubtedly succumb to snake bite, while others possibly die of food poisoning—see E. A. Temple Perkins in the *Uganda Journal*, Vol. 3 (1935-36), p. 79, and Vol. 11 (1947), p. 38. Diseases such as anthrax may also take their toll. The Elephant is an animal of conservative habits and is unwilling to leave a favoured waterhole until the last drop of liquid is exhausted, and this may lead to the death from thirst of a number of animals. Powell Cotton (1904) discovered a large accumulation of Elephant bones close to a waterhole near Zingote in Turkaṇa, and although his African guide assured him that this indeed was an Elephant cemetery, it is probable that a period of severe drought was responsible for the deaths of these animals.

Captain Pitman has been told that on Kadam, above Amaler, there is a valley which used to be visited seasonally by Elephants. The entrance to the valley is said to be very narrow and commanded by high rocks. Elephants once inside were trapped, their egress prevented by spearmen on the rocks. Such a slaughter-place is a potential cemetery.

There are also recorded instances of Elephants becoming completely bogged in mud and dying a slow death from exhaustion and starvation. I fear the real Elephant-cemetery to which the old Elephant wends his way, when life begins to fade, to lay his bones among countless others of his kind, is only to be found in the Africa of Tarzan of the Apes and Trader Horn.

Order: HYRACOIDEA.

Family: PROCAVIIDAE. Hyraxes.

PROCAVIA sp. Large-toothed Hyrax, Rock Hyrax, Rock Dassie, Rock Rabbit.
Karamojong: *Aduka, ngadukai*.

TAXONOMY: Up to the time of writing (mid-1948) I have only collected Rock Hyraxes from Central Karamoja, i.e., Nabilatuk, Amuda and Narathai,

and it is quite possible, therefore, that other species occur in the north-west. I believe the Grey Hyrax, *Heterohyrax syriacus bakeri* (Gray), has been reported from east Acholi.

Dr. MacInnes of the Coryndon Museum, Nairobi, has kindly compared my specimens from Karamoja with those in the museum collection and he considers that they are nearest to the *Procavia habessinica* group. *Procavia habessinica daemon* (Thomas) occurs on Mt. Elgon but it is characterized by long, soft fur of a rich dark colour, quite unlike the coat of the Karamoja form. Dr. MacInnes considers that the latter may be a new race or perhaps an extension of one of the Abyssinian forms.

Some years ago Mr. G. H. E. Hopkins sent specimens of the Rock Hyrax from Maru near Kotido to the American Museum of Natural History and these were provisionally determined as a subspecies of *Procavia lopesi* (Thomas & Wroughton), the type locality of which is Kodja Hill, Gaima Range, Kibali River, Monbuttu, Belgian Congo. Allen, however, considers *Procavia lopesi* merely a subspecies of *Procavia johnstoni* (Thomas). Mr. Hopkins has, however, pointed out to me that *Procavia johnstoni* has one set of lice and *Procavia lopesi* another. The taxonomy of the Karamoja Rock Hyrax is clearly very confused; the only certainty is that the animal belongs to the genus *Procavia*.

DISTRIBUTION: Abundantly distributed throughout Karamoja among the rocky scrub-covered 'kopjes' wherever there are suitable cracks, crannies and overhanging rocks to afford them shelter, e.g., Kwatabok, Nabilatuk, Amuda, Narathai, Kaabong and Nangeya. There is a small colony on Alekilek, which is just over the Teso border, but I have not found them elsewhere in that district.

DESCRIPTION: In general appearance the Rock Hyrax is not unlike a large earless rabbit. In total length it measures about 15 in.—the tail is very short—and weighs about 7 lb. The neat rounded ears lie flat against the head. The hair is short and rather coarse. The general colour of the upper parts is medium to dark brownish grey, the crown of the head and the centre-line of the back being noticeably darker than the rest of the body: the basal two-thirds of each hair is greyish brown, the remainder dark brown tipped with sandy buff. The lighter flanks possess a somewhat mottled appearance and are suffused with orange buff, but there is considerable variation between individuals in the intensity of this colour. The under parts, including throat and chin, are dirty cream. Long black whiskers, up to 7 in. in length, are present. In the centre of the back there is a narrow elongated glandular patch surrounded by orange hairs, in marked distinction to the darker colour of the upper parts. The glandular patch is much more noticeable in some specimens than others.

The dentition of the Rock Hyrax is unusual and deserves a brief mention. Canine or eye-teeth are entirely wanting in both jaws. In the upper jaw there is one pair of incisors which are typically rootless and somewhat rodent-like in appearance except that they are pointed—those of rodents are more chisel-like—and are triangular in cross section. The lower front teeth consist of two rooted pairs of incisors, the outer pair being almost horizontal. The cheek-teeth, which have much in common with those of the rhinoceros, are separated from the

incisors by a considerable gap, a feature also shared by members of the rodent family.

On each of the forefeet there are four functional toes all furnished with small short nails ; on the hind foot there are only three toes, the second digit being provided with a small claw in the place of the usual nail. The flat thick soles are black and rubber-like and may assist the animal to scramble on the rocks.

The female has six mammae.

BIOLOGY : The peculiar cry is very often the first indication of the presence of the Rock Hyrax. To me it bears a close resemblance to the loud clucking of a pullet, thus: 'chee-up'; sometimes 'chee-up, chuk chuk'. It calls in the early morning and again in the evening and to a later hour on a moonlight night.

The Rock Hyrax feeds on leaves and bark and will climb small trees in search of food. During the heat of the day it lies sunning itself on the top of its rocky home, every now and then rubbing its chin on the rough surface of the rock. On cold and windy days it prefers the shelter of some cleft or overhanging boulder.

It is remarkably agile, and is sharp-sighted and possesses a good sense of hearing ; when attacked by dogs it can put up a spirited fight in defence of itself. Shortridge states that when wounded it is apt to bite savagely and if it gets a grip it will hang on like a badger. When alarmed it at once disappears down the nearest cranny and a wounded animal is consequently extremely difficult to retrieve.

It deposits its pellet-like droppings in some selected places and, as they take a considerable time to disintegrate, great accumulations of dung among the rocks are a marked feature of its home.

Leopards and the lesser carnivores, as also some of the larger birds of prey, take toll of the Rock Hyrax, but it appears to live in friendly relationship with the packs of the dwarf mongoose which inhabit similar localities. Occasionally it will leave its rocky fortress and venture out a short distance into the bush ; with its line of retreat cut off by strategically placed hunters a number fall victims to dogs and sticks. Verreaux's eagle (*Aquila verreauxi*) feeds mainly on Rock Hyrax.

The young are born at the end of some suitable cleft in the rocks and are two or three in number ; a female shot at Nabilatuk in April contained two embryos. In the case of *Procavia capensis*, in South Africa, there does not appear to be any particular breeding season though it is said to breed only once a year. The gestation period is reported to be 225 days. I have seen a very young Rock Hyrax which was extremely active and lively, and it is probable that the young begin to move about soon after birth.

MISCELLANEOUS : The flesh is relished by the Karamojong. I understand it should be cooked in the skin in an earthenware container to obtain the full flavour. The young make interesting pets—they will eat almost anything in the vegetable line—but are liable to bite.

(To be continued)