

FIELD NOTES ON VERTEBRATES COLLECTED BY THE
SMITHSONIAN - CHRYSLER EAST AFRICAN EXPEDI-
TION OF 1926

By ARTHUR LOVERIDGE,

Of the Museum of Comparative Zoölogy, Cambridge, Mass.

In 1926 an expedition to secure live animals for the United States National Zoological Park at Washington was made possible through the generosity of Mr. Walter Chrysler.

Dr. W. M. Mann, the director of the Zoological Park, has already published a report on the trip;¹ the following observations were made by the present writer, who was in charge of the base camp at Dodoma during three and a half of the four months that the expedition was in the field.

The personnel of the party consisted of Dr. W. M. Mann, leader of the expedition; F. G. Carnochan, zoologist; Stephen Haweis, artist; Charles Charlton, photographer; and the writer. Several local hunters assisted the party in the field for longer or shorter periods, and Mr. Le Mesurier operated the Chrysler car.

The expedition landed at Dar es Salaam, capital and chief port of entry for Tanganyika Territory (late German East Africa), on Thursday, May 6, and left on the following Monday by train for Dodoma, which had been selected as headquarters. The expedition sailed from Dar es Salaam on September 9.

Dodoma is situated on the Central Railway almost exactly one-third of the distance between the coast and Lake Tanganyika. It was primarily selected as being a tsetse-free area and therefore a cattle country where milk in abundance could be obtained for the young animals; it is also the center of a region unusually free from stock diseases. Secondly, it fulfilled a necessary condition in not being too far from the coast, and while animals could be brought in on the railway from east or west, an automobile road running north and south permitted our tapping the game areas in those directions also.

¹Smithsonian Misc. Coll., vol. 78. No. 7, pp. 10-21, Apr. 21, 1927.

Using the Central Railway from Dar es Salaam to Kigoma for purposes of orientation, the localities which were drawn upon for the zoological park may be conveniently listed as follows:

Arusha, 200 miles north, almost due north of Dodoma on Central Railway.

Bahi, on Central Railway, west of Nzingi station. Approximately 3,600 feet.

Dodoma, on Central Railway, about 260 miles inland from Dar es Salaam; 3,700 feet.

Ikikuyu, 90 miles southeast of Dodoma.

Irazo, a village near Dodoma.

Kibakwe, 80 miles southeast of Dodoma.

Kifukulo, a village said to be eight hours' walk from Dodoma.

Kikombo, on Central Railway, first station east of Dodoma; 3,500 feet.

Kikuyu, a village 1 mile from Dodoma.

Kilamatinde, about 10 miles south of Saranda station on the Central Railway.

Kilosa, on Central Railway, 160 miles inland from Dar es Salaam.

Kiva mtango, a village near Dodoma.

Kizumbi, in Shinyanga subdistrict north of Tabora, on the Central Railway.

Kondoa Irangi, 105 miles due north of Dodoma. Capital of Kondoa district.

Kongonda, a village 9 miles from Dodoma.

Malenga, a village near Dodoma.

Manyoni, on Central Railway, west of Saranda station. Altitude, 4,000 feet.

Mbulu, a subdistrict of the Arusha district north of Dodoma.

Mfilima, a village near Dodoma.

Mkata Plains, crossed by the Central Railway, 140 to 150 miles from Dar es Salaam.

Msanga, a village near Dodoma.

Mtangalala, a village near Dodoma.

Mtita's, a chief's village near Dodoma.

Mukwese, about 10 miles north of Manyoni station on the Central Railway.

Nzingi, first station west of Dodoma on Central Railway. About 3,600 feet altitude.

Ruaha, a river flowing through the territory south of Dodoma.

Saranda, a station on the Central Railway with an approximate altitude of 3,000 feet.

Shinyanga, on the new Tabora-Mwanza branch line of the Central Railway.

Singida, capital of a district northwest of Mukwese.

Tabora, on the Central Railway, 530 miles from Dar es Salaam.

Tindi, in Shinyanga district; that is, due north from Tabora.

Tulo, south of the Central Railway at a point about 120 miles from Dar es Salaam.

Zanzibar, an island 40 miles northwest of Dar es Salaam.

The Dodoma district is for the most part a very arid region. This is particularly the case with regard to Dodoma itself, situated in a sandy, thorn-bush area whose flat monotony is only relieved by rocky kopjes which form centers for mammalian life, particularly for the larger carnivora, such as leopards and hyenas.

The resident population are essentially a pastoral people, devoted to their herds of cattle and goats and sufficiently opulent to be somewhat indifferent to augmenting their income by capturing wild animals. Nevertheless, the bulk of the collection, more particularly the birds, was secured by these people, who came in from all the villages within a day's walk of the township.

The chief tribe inhabiting the Dodoma district are the Wagogo, whose origin is somewhat obscure and still a matter of debate among ethnologists. As already indicated, their wealth consists of flocks and herds; in these they invest any money they derive from other sources and the natural increase of the animals constitutes the interest on their investment. In times past they protected their herds from attacks by lion and leopard but to-day they not unnaturally look to the Government to destroy such creatures for them.

They appear to cultivate a minimum amount of maize, rice, or other cereal and thus through the failure of a rainy season, having no reserves, they may be plunged into famine. In the past their herds have suffered from the same cause. One of the functions of government is to anticipate such seasons and have a supply of food on hand.

Around their cultivated plots, locally called "shambas," they make a fence of piled-up thorn bushes to keep out the ungulates, which would otherwise make short work of any produce. Unfortunately the hedges provide a refuge for a rat (*Arvicanthis abyssinicus neumanni*) which makes its burrows beneath them in comparative security. The wily dikdik also often manages to creep through the defense, and the custom is prevalent in some parts to leave gaps at intervals in the hedge with a deadfall set above it. As a tribe the Wagogo are poachers rather than hunters; their favorite method for securing game is to dig pits on game trails or to scare the animals over ground where they have prepared concealed pits.

They are adepts at snaring birds and as a result guinea fowl are scarce near large centers like Dodoma. It is not to be wondered at that young herdsmen, with time hanging heavy on their hands, occupy themselves in setting snares. A more serious cause for the disappear-

ance of game is the probability that these people find a large proportion of the freshly dropped young of dikdik, duiker, and other game animals. If these are habitually taken for the small amount of meat they afford, the extermination of the game in the grazing areas is only a matter of time. In one sense there is no justification for such slaughter, as they have plenty of available meat in their own herds; the same argument, however, applies with even greater force to the European sportsman, and one can scarcely blame the native for not wishing to draw on his small bank account (in the shape of his herd) when he can obtain a variety of diet without doing so.

The huts of the Wagogo are usually built around three sides of a square, the fourth being stockaded and provided with an entrance which is closed at night after the cattle are driven in. Owing perhaps to the difficulty of obtaining tall poles in sufficient quantities, these huts are very low, and it is quite impossible to stand up in them. The roofs are flat or slightly sloping and covered with sods of earth plastered with cow dung; upon them the stock of "mahikwi" is kept; this is a pumpkin plant that grows in their gardens. Occasionally a hungry lion will spring on the roof and from thence into the central yard where the cattle are kept. Then he is shot, while upon his kill, with poisoned arrows fired from chinks or loopholes in the wattle-and-daub inner walls of the huts.

The Wagogo are skillful in the construction of spears, arrows, shields, swords, and scabbards, and show an interesting taste in ornamental beadwork, such as belts, armlets, and collars, each with a different, if somewhat crude, pattern. It is commonly said that they never wash, the application of rancid fat serving the purpose of keeping the skin supple and in good condition. However that may be, they are not an attractive people in the eyes of most Europeans. This is not solely on account of their appearance by any means; in part it is on account of their unsatisfactory behavior as workmen. Though they may apply for work they have no conception of steady application; their traditions and upbringing render them unsuitable as a race for anything but herding and veterinary occupations. Occasionally one hears of an Mgogo personal servant; such a one has generally been trained at a mission station.

In the days of the early explorers and before the country was opened up the Wagogo had a reputation for being truculent; each petty chief, foreshadowing the modern customs system, made demands for largesse before the traveler was allowed to pass through his little district.

Very different are the tribes to the west and east. The Wanyimwezi, whose capital town is Tabora, are notoriously willing workers, and parties of them used to make the long journey to Zanzibar in early times to seek for work as carriers. As a people they are more

fearless of snakes than most, while a cult of their tribe, called the Wayeye, are professional performers with those reptiles of whose attributes and habits they possess a strange mixture of ignorance and knowledge.

The Wakami, with headquarters at Morogoro, or rather in the mountains behind, are a sturdy hill people, cultivating a great deal of maize and eating little meat. The only reason for including their native names for some of the animals was because three Wakami were with the expedition, and the opportunity appeared good to record what they called the animals.

A few Kiswahili names are added; the Waswahili, being a town-dwelling coastal people, do not live very near to nature, and it is only one Swahili here and there that is a reliable informant. Even then the names they apply to most of the smaller creatures are generic rather than specific; they have not, for example, a different name for each species of rat—two or three do duty for all.

Though I have appended the Chigogo names for reptiles, they are of doubtful value without further checking, as species are apt to be confused. They were furnished by a committee of 12 or more old Wagogo men.

These notes do not purport to deal with the whole collection, being mainly concerned with those animals taken in Dodoma district or which were under my charge at Dodoma for a considerable time.

The only new vertebrates secured have been described elsewhere.²

Measurements, where skins were preserved, are by my native collector Ramazan. They are given in the following order: Length of head and body; tail without terminal hairs; hind foot without claws but with hoof; ears.

Besides the parasites mentioned under their respective hosts, two hippoboscid flies (*Hippobosca equina*) were taken on native keepers at Dodoma at different times, and another *Ornithesza metallica* Schiner on a weaver bird (species not determined) collected at Dodoma, August 4, 1926.

My grateful thanks are due to the following specialists for identifying material submitted to them and mentioned in these pages: Gerrit S. Miller, jr., such mammals as are marked with an asterisk; Dr. Charles W. Richmond, such birds as are marked with an asterisk; Dr. H. E. Ewing, parasitic fleas; Dr. E. A. Chapin, parasitic ticks; Dr. J. H. Sandground, parasitic worms; Dr. J. M. Aldrich, parasitic flies; and Dr. H. Friedmann, for revising and bringing up to date some of the nomenclature of aves. Also Mr. A. V. Hartnoll, the district administrative officer at Dodoma, for supplying me with the altitudes

²Miller, 1927, A new *Pedetes* from Tanganyika Territory, Proc. Bio. Soc., Wash., vol. 40, pp. 113-114 and Loveridge, 1928, Description of a new species of gecko from Tanganyika Territory., Proc. U. S. Nat. Mus. vol. 72, art. 24, pp. 1-2.

given in the preceding pages and many other kindnesses while at Dodoma; Mr. F. G. Carnochan, for the photograph of the finch lark's nest which he took for me; and Mr. R. H. Rockwell, for his excellent photographs of Dodoma and scenes in the vicinity.

MAMMALIA

CERCOPITHECUS PYGERYTHRUS JOHNSTONI Pocock

JOHNSTON'S GUENON

Native names.—Njadengwa (Chigogo); Tumbili (Kiswahili).

More than 60 of these monkeys were brought in from around Dodoma, Saranda, Kilamatinde, Manyoni, and Kondoa Irangi. Most of them were trapped in the natives' gardens. The "njadengwa" are inordinately fond of the three principal products of the district—namely, "mtama" (millet), maize, and "mahikwi" (pumpkin). They also like "kundi" (beans), groundnuts, and the green tops of potatoes. Papaw and bananas were occasionally given as a luxury.

Feeding them, therefore, presented few difficulties; the usual procedure was to give them milk at 8 in the morning; the administration of this was a tedious business, as the bowl had to be held while each individual drank; otherwise they scuffled and upset it, though not so invariably as the baboons did.

At 9 in the morning a plate of boiled rice was put in every cage and at noon a maize cob or "mtama" head was issued to each monkey to while away the long hours of the afternoon. Water was taken round between 4 and 5 in the afternoon, and then the evening meal, of cooked, ground maize mixed with "kundi" was put into the cages.

Deaths were rare and such as occurred were attributable to injuries inflicted on the animals by their captors or to fighting among themselves. They are very pugnacious as a race and one individual will bite a piece clean out of another or half sever a tail. Temperamentally, however, they vary as much as human beings and when caught young and kindly treated they prove docile and affectionate, for a time at least.

One half-grown monkey, purchased at Manyoni, was notorious for attacking everybody as well as his companions, and was only finally reduced to order by being confined with an old male twice his size, to whom he paid every respect. In reality, his attitude was servile in the extreme. To see him sit quietly while the older animal fed was a revelation to those who had known him foremost in grabbing every tidbit and menacing any other monkey who approached.

One evening when passing the cages I noticed a row of monkeys on a perch. The end one suddenly seized his neighbor and bit him in the shoulder; the latter seized a tail—not that of his aggressor—and gave it a bite. The owner of the tail, with his eyes on me, grabbed at the

tail of the next in the row and bit it, almost mechanically it seemed to me. The whole incident might perhaps be attributed to the boredom of captivity.

In the custom's shed at Dar es Salaam two of the animals escaped; the native keepers wished to give chase, but the possibility of capture was so remote that I ordered them to desist. At feeding time both monkeys returned and were readily secured as they sat on the cages that had so lately been their prisons.

The species was also seen at Nzingi, 6 miles west of Dodoma.

PAPIO CYNOCEPHALUS (Linnaeus)

YELLOW BABOON

Native names.—Mhuma (Chigogo); Nyani (Kiswahili).

Six specimens, said to have been taken in the neighborhood, were brought in to our base camp at Dodoma. The dietary supplied these animals in no way differed from that enumerated for Johnston's guenon, except that a dead bird would occasionally be given to one of the older animals, by whom it would be eaten.

None of our captives were much more than half grown, while one was so young when received in May that it must have been less than a fortnight old. Its black hair gave place to the tawny coat of the adult during the first three months of its captivity. When it was received we already had a pair of yellow baboons wearing belts to which cords were attached. The baby, which screeched without ceasing, awoke the maternal instincts of the young female, which promptly adopted it, and the spidery-limbed youngster might be seen clinging around her at most hours of the day. She was very considerate in allowing it to drink first and in many other ways. After awhile she found the clinging weight growing burdensome and probably uncomfortably warm, and so tried to "wean" it of its attachment. If it left her to eat (it was not chained up), she would, by adroitly skipping this way and that, avoid it, and our nerves would be harrowed by the most ear-splitting screams from the infant until she relented and cuddled it to her bosom once more.

The young male had been obtained from an Indian who kept it chained to a pole in his yard. It had been the butt of boys who had teased it into a very nasty temper from which I imagined it would never recover. About this time it effected many escapes by biting through its cord or biting the person who was leading it from its sleeping place. It generally ascended to the roof or led the chase away toward the village. These escapades resulted in much waste of time, so a large cage was prepared for the reception of the three baboons.

In passing, I might mention a most useful arrangement in this cage, which was the idea of Stephen Haweis. The cage was a large pack-

ing case and was horizontally divided by two narrow planks running lengthwise, onto which were nailed two other planks at right angles. This not only nearly doubled the seating capacity of the cage but left nine spaces through which the animals could play "follow my leader" and other riotous games, which they did with a will. To start the fun it was only necessary for a baboon on the "ground floor" to jerk, as if it were a bell rope, the tail of one of its companions sitting above; the summons was soon answered.

The effect on the young one of being confined in a cage was remarkable; it left its adopted parent for a separate existence and was first with its mouth into any plate of food put into the cage. The step-mother now assumed a different rôle of guardian angel. Sitting on the scaffolding above, she would reach down and seize the youngster by the hair of his head, gently lift him to her, pull open his mouth and feel around it with her finger till she extracted the food, which she would sniff at and then put into her own mouth, allowing him to return to his meal. The serious air with which she performed these ludicrous actions was intensely funny.

The young male also became very tame and docile, so that if one pushed a finger through the wire netting he would take it in his mouth and bite it very gently, letting it remain in his mouth indefinitely. The female had the same little trick, which was soon adopted by the infant. At first she resented this by immediately seizing the "child" and cuddling it to her bosom as she retreated to the back of the cage. During August her attitude changed. If the youngster took anyone's finger in his mouth—and he became most forward of all in doing so—she would quickly push him aside and bite the finger very fiercely, so that I learned to withdraw it promptly as soon as I saw she had observed the intrigue.

Another of their customs after they had been fondling each other was for her to let her tongue hang out of her mouth until he gently took it up in his.

Five other baboons shared the cage of the trio during the last month, but whatever disagreements arose the adopted infant was never molested and his sleek condition and rounded paunch spoke well for the way in which the foster mother exercised her guardianship.

One other baboon deserves special mention. She was more than half grown when brought in by a native; her right ear had been bored to carry a little red twine. I should like to have seen more of her master, for though he parted from her for a comparatively paltry sum her behavior emphasized the extraordinary kindness with which she had been treated. One had but to hold out one's arms and she would spring into them, hugging one to the accompaniment of little crooning sounds or "urrs" of satisfaction. She gave us to understand

that first evening that she would not be shut in a cage. She pointed the argument by biting, at first gently then more severely, and she escaped three times within the hour. Thereafter we allowed her to have her own way and be kept on a chain. At night she slept in an empty room and cuddled a good-natured monkey who also disliked cage life. She escaped many times but caused no anxiety, for when menaced by strangers, or when anyone threw things at her, she would at once rush to the arms of any member of the staff.

When a number of guinea fowl escaped one day with consequent running and shouting, she climbed up a slender telegraph pole and, sitting on the top, surveyed the scene with the greatest interest. Another day we were just starting off in the car when she rose from the veranda and ran toward us, holding out her arms appealingly as she stood almost erect on her hind legs. It was too human and there was nothing to be done but take her in on the front seat. She appeared to enjoy the change and passing objects with almost as much interest as is shown by a dog under similar conditions.

She indulged in the usual simian pastime of fur or skin cleansing in one's hair and it was no unusual sight to see little Indian girls lying on the veranda while she cleaned their tresses with great solemnity; at other times it would be the policeman on duty who would have his fez removed by her and his wool subjected to the same close scrutiny.

PAPIO NEUMANNI Matschie

OLIVE BABOON

Native names.—Mhuma (Chigogo); Nyani (Kiswahili).

Formerly very common at Dodoma, these animals are decidedly scarcer on the kopjes in the immediate vicinity of the town, so much so that I never saw or heard one during the three months I was at Dodoma, though I came on fresh spoor 6 miles east and had the sleeping place of a small troop pointed out to me. The food given to those which were brought in from Kondoa Irangi was similar to that supplied to the yellow baboons. The young olive baboons seemed more quarrelsome and peevish than the former.

GALAGO GARNETH (Ogilby)

ZANZIBAR LEMUR

Native name.—Komba (Kiswahili). Does not occur in Ugogo.

Undoubtedly the most delightful creature in the collection was a young lemur which I purchased in the streets of Zanzibar on the outward voyage. It grew rapidly and on the eve of embarkation had a beautiful thick coat which it kept immaculately clean; its tail was not so heavily furred. It was very fond of milk and drank half a glass daily; its staple food was papaw, but it was not as fond of

other things to the same extent as some Pangani lemurs which I have known. Sweet things in general it liked, particularly cake, but was not at all keen on meat, either raw or cooked. Its chief delight was to be let out of its cage, when it progressed across the floor by the funniest little jumps of the long hind limbs until it reached furniture, when it sprang from one article to another with astonishing energy and was tireless in its activity. While it slept a good deal during the day it was always ready to come out to play or be carried around. Its bite could draw blood but was usually only given in friendliness. It was quite tolerant of *G. sennaariensis* confined in the same cage.

GALAGO PANGANIENSIS (Matschie)

PANGANI LEMUR

Native name.—Komba (Kiswahili). Does not occur in Ugogo.

A three-quarter grown lemur was sent in from Kondoa Irangi early in August. It remained in its sleeping box during the day and never showed itself till about an hour after dark, when it might be interrupted feeding. While milk and papaw were its principal food, it was generally given raw minced meat, which was relished. A second specimen purchased by Doctor Mann in Dar es Salaam bit through its cord and escaped at Dodoma. Largest male, 170. 270. 60. 40 mm.

GALAGO SENNAARIENSIS Lesson

SENNAAR LEMUR

Native name.—Ndele (Chigogo).

A dozen individuals were brought in, about half at Kondoa Irangi, the remainder at Dodoma. Another was captured by my collector at Saranda, where silhouetted against the moonlight I used to see them springing gracefully about in the mimosa thorn. They are very difficult to keep, as milk and papaw seem to be the only things they will eat besides bananas, and the latter were often unobtainable. The papaw appeared to induce diarrhea. Bread, meat, prunes (raw or cooked), rice, and jellies were all rejected and left untouched. They also appeared to be quarrelsome, for several were bitten on the nose or tail by their companions. At least two were killed in this way.

CHAEREPHON LIMBATUS (Peters)

FREE-TAILED BAT

Native names.—Ibudibudi (Chigogo); Popo (Kiswahili).

A male, 50. 40. 21. 14. 130 mm., was found one morning on the veranda of Kilamatinde boma.

***LAVIA FRONS REX** Miller**YELLOW WINGED BAT**

One from Saranda.

***HIPPOSIDEROS RUBER** (Noack)**RED NOSE-LEAF BAT**

One from Saranda.

***EPTESICUS** Species

One taken in a lighted room at Saranda.

***PACHYURA LIXA AEQUATORIA** Heller**MUSK SHREW**

One from Dodoma.

ATELERIX HINDEI SOTIKAE (Heller)**SOTIK WHITE-BELLIED HEDGEHOG**

Native names.—Sejesi (Chigogo); Kalunguyeye (Kiswahili).

Individually an excellent pet, socially a villain; these attractive little animals are so fond of milk and minced meat that they will feed immediately after capture, but either a craving for fresh blood or some innate ferocity causes them to eat each other's feet. It would seem necessary, therefore, to keep them separately or in pairs, any crowding resulting in fatalities.

While a few of our specimens were quite definitely caught near Dodoma, the majority came from Kondoa Irangi, where they are very abundant. Two very young ones received from that locality, on August 26, 1926, only measured: Male, 80. 10. 16. 10 mm.; female, 85. 10. 15. 10 mm.

PARAXERUS OCHRACEUS OCHRACEUS (Huet)**OLIVE SQUIRREL**

Native names.—Tanji (Chigogo); Panya ya miti (Kiswahili).

Members of this genus, as noted elsewhere make delightful pets if secured young. Most of the expedition's specimens were caught as adults and all came from the vicinity of Dodoma, where they occur in the dense scrub which clothes the larger kopjes.

Their needs are simple, a branch, a gourd, some cobs of maize, a small tin of milk, a piece of papaw or pumpkin, a chicken bone with some cooked meat left upon it—on these they will thrive. One performed a Catherine-wheel trick when anyone stood before its cage. With great swiftness it would run along the branch up the side of its box and along the roof, which was composed of rough board, and so back to its starting point.

Measurements: Male and female, 135. 160. 30. 10 mm.

DIPODILLUS LUTEUS Dollman

GERBIL

Native name.—Mbadya (Chigogo).

I captured one of these gerbils at Dodoma one evening as it ran across the path in the moonlight; it was kept in a small cage which it shared amicably with a *Leggada bella bella*. Maize, potatoes, "mtama," and groundnuts were provided for it, and on these it subsisted for three months, and was still alive at the time of embarkation.

TATERONA SWAYTHLINGI Kershaw

SWAYTHLING'S GERBIL

Native name.—Mhanya (Chigogo).

Taken from a burrow into which it rushed from another that was being opened up in an attempt to capture a lizard. Kept in a zinc-lined box and fed on the same diet as the foregoing species; it thrived. These gerbils do not appear to be very common about Dodoma.

RATTUS RATTUS ALEXANDRINUS (Geoffroy)

ALEXANDRINE BLACK RAT

Native name.—Ngule (Chigogo); Panya (Kiswahili).

A great many Alexandrine rats were captured for feeding the owls, genets, and snakes.

RATTUS COUCHA MICRODON (Peters)

SHAMBA MOUSE

Native name.—Mhanyalusangha (Chigogo).

Not common at Dodoma apparently, though six were taken in a wire trap in one night, almost the only occasion on which any were trapped. They were killed and eaten by *Psammophis subtaeniatus* and *Bitis arietans*.

LEGGADA BELLA BELLA Thomas

PIGMY MOUSE

Native name.—Chimhanga (Chigogo).

During May and June half a dozen of these little creatures were captured on the premises, usually discovered when moving cages. The diet supplied to the gerbils sufficed for these also, though at the time of writing all have escaped save one.

ARVICANTHIS ABYSSINICUS NEUMANNI (Matschie)

UNSTRIPED GRASS RAT

Native name.—Fudi (Chigogo).

This abundant diurnal species was the rat most commonly trapped for feeding the owls. The great drawback to trapping them was the

thieving habits of the Wagogo, who appreciate wire traps to such an extent that they stole more than a dozen of them. It seems probable that our trappers were watched from afar as an attempt was made to conceal them. Petty thieving should be taken into consideration by anyone contemplating collecting or residing in the Dodoma district.

* PEDETES CAFER DENTATUS Miller

SPRINGHAAS

Native names.—Kesi (Chigogo); Kupa (Kiswahili); Sembe (Kikimba).

Occurs close to Dodoma station; one was brought in from Kifukulo, eight hours away; another was trapped at Mukwese; and yet another came from Kondoa Irangi. There is no reason why this animal should not do well in captivity under favorable conditions. The two we have now have been fed for the past couple of months on maize, "mahoga" (native potatoes), "mahikwi" (pumpkin), and groundnuts. They will take the maize cobs from one's hand and, holding them in their short, front paws, sit up at once to eat them. By day they sleep all huddled in a heap, their heads concealed. They wake up late at night and hop on their hind legs about the room, which they shared with a dozen porcupines. They should not be confined in a small cage, as they will jump against the roof until they wear all the fur, skin, and flesh from the top of their heads. The cage must be metal lined, as their powerful front teeth make short work of any wood; ordinary wire netting soon succumbs to these same teeth. After the foregoing was written, and three days before they would have been removed, one of these hares was killed by a porcupine as related below.

HYSTRIX GALEATA Thomas

PORCUPINE

Native names.—Nungu (Chigogo); Nungu (Kiswahili).

Porcupines were brought in from near Dodoma, Kondoa Irangi, and Shinyanga. At Mukwese, a bell-like note was heard nightly in the plantations after 10 o'clock; I mistook it at first for the cry of a hunting dog, but the local natives declared that porcupines were responsible.

They were fed on precisely the same food as the jumping hares, while young porcupines, much larger than a domestic cat, showed great fondness for milk. One little beast, who used his teeth offensively on the hand that put milk into his cage, seized the bowl in his teeth and would run backward with it, and usually upset it. To see a small porcupine in a rage is an amusing sight; to the accompaniment of an explosive noise he stamps his feet, shakes and erects his quills, and sets those in his tail rattling, making himself altogether unpleasant

to handle. If confined in a room they will gnaw the doors in a most astonishing and persistent manner, and it is a stout cage that will hold a porcupine in captivity for long.

Just a few days before embarkation, the porcupines killed a jumping hare, and ate more than half its head, this despite the fact that they had occupied the same room for two months.

HELIOPHOBIUS EMINI Noack

BLESMOL

Native name.—Fuko (Kiswahili).

A single blesmol was captured in the road near Dodoma and was placed in an empty paraffin drum three-quarters filled with earth. The drum was covered with double-wire netting (single soon gave way), which it spent its time in gnawing very persistently during the two months of its captivity. It thrived and was in excellent condition and its death was entirely due to the negligence of a native attendant. Maize, European potatoes, and groundnuts were its food. Occasionally the earth was damped to make it bind better for the burrowing operations of the blesmol; and it was changed once a fortnight.

LEPUS species

HARE

Native names.—Sungula (Chigogo); Sungula (Kiswahili).

Hares are decidedly scarce in the neighborhood of Dodoma. I only encountered one in the open and that was near the station; at Saranda they are comparatively common. A young one as tame as a domestic cat was presented to the expedition by some ladies living near Dodoma. It drank milk from a saucer, nibbled grass, and if put down made no attempt to escape.

A very emaciated adult was brought in by a native who alleged he had run it down. It was found to be swarming with fleas (*Ctenocephalus felis* and *canis*, also *Echidnophaga* species), ticks (*Rhipicephalus appendiculatus*, males and females, *Haemaphysalis leachi*, males and females), and worms (*Dermatoxys velligera*), when it died (August 28, 1926), and a nymphal tick of the family Ixodidae a couple of days later. Measurements of adult female are 460. 10. 120. 125 mm.; young female, 235. 50. 70. 80. mm., taken on August 6, 1926.

THOS MESOMELAS MCMILLANI Heller

MCMILLAN'S BLACK BACKED JACKAL

Native names.—Nchewe (Chigogo); Bweha (Kiswahili)

Two jackals were box trapped at Dodoma, a locality where they are very abundant. One of these animals gave birth to five puppies on July 24, but she ate one and would not feed the others. Another, a male, which was preserved, measured 170. 75. 30. 10 mm.

Three puppies from near Dodoma were brought in on August 20, and were of the same size as four from Kondoa Irangi, received somewhat earlier the same month. The black pelage at birth gives place to an almost uniform fawn color, on which the black and silvery saddle marking subsequently makes its appearance. Four adults were also trapped at Kondoa Irangi and one of these, as the attendant was cleaning out the cage, made a successful dash for liberty the morning after its arrival. It easily led the chase across the common to the village and away beyond. On two occasions one of the Dodoma adults escaped. Each time I was apprised of this by the fluttering of the birds in their cages and on going out saw the jackal in the moonlight. The first time it ran into the kitchen and sought refuge under a table in the corner. Salimu pulled it out by its tail and carried it snapping wildly to a box in which it was shut until morning. By day a jackal has such a benign and mild expression that one could scarcely credit the difficulty of handling it at night. Their bite commands respect. Nikola was transferring a jackal from one cage to another, wearing thick leather gloves for the purpose; as he pulled the jackal out by its tail there were two quick snaps and Nikola found himself divested of both gloves and the thumb of the left glove snipped off as if by shears!

The first escape was achieved by biting through wire netting, the animal forcing its way through and losing much fur in the process; the second time it got out by gnawing a board along the bottom of its cage and squeezing through an aperture $4\frac{1}{4}$ inches in height.

Their food was chopped meat, varied from time to time with bush fowl; duck they would not take, preferring to starve; nor would they touch cooked mealie meal unless it was mixed with a heavy percentage of minced meat. About 4 or 5 o'clock in the morning, they generally quarrelled, as I was informed by the sharp yelps and scuffling, but on going to inspect with a lantern I would be met by mildly blinking eyes and most innocent expressions.

LYCAON PICTUS subspecies

HUNTING DOG

Native names.—Iminzi (Chigogo); Umbwa ya mwitu (Kiswahili). A native "skin" from Msanga near Dodoma was brought to us by a native one day.

OTOCYON VIRGATUS Miller

EAST AFRICAN LONG-EARED FOX

Native name.—Nehenjeje (Chigogo).

Two foxes now in the collection were caught as adults at Kondoa Irangi. They appeared to subsist on next to nothing and never cleared up their plate except on one occasion when minced boiled

eggs and meat were given them. After a day or two they tired of this and were put back on raw minced meat. None of the things so relished by my Mkalama fox tempted them, sweetened cereals or papaw were left untouched. Milk, and bread and milk, they liked in moderation.

This animal seems fairly common at Saranda, for Mr. Robbie showed me an earth where, one morning, he had seen eight basking and killed five with three cartridges from a 12-bore shotgun. He was under the impression that they were jackals. One evening I met a fox which seemed remarkably bold and curious. Salimu shot it later and I was able to show Mr. Robbie its intestines (the stomach being empty), crammed with termites' heads, as evidence of its harmless diet and usefulness. It was a male and measured 520. 230. 40. 90 mm. and had two large cysts beneath the left foreleg and two smaller ones on the intestine.

MELLIVORA CAPENSIS Schreber

CAPE HONEY BADGER

Native names.—Muhiru (Chigogo); Nygeri (Kiswahili).

Early in August a two-thirds grown ratel was brought in uninjured; no suitable cage being available, it was put into an ordinary one with its face toward the wall and this cage was weighted above and behind. I visited it several times in the night. Next morning, as I had anticipated, the wire netting was torn to rags. It was transferred to a new cage but ate through a stout post, splintered others, and dropping 4 feet to the floor roamed about the room which held over a hundred boxes of birds and animals. At daybreak I located it behind some bird cages and shut it in by pushing the cages to right and left of it against the wall. A box trap was then set in the doorway and a barricade of cages built up to form an avenue from the spot where the ratel was to the door; of course, the backs of the cages were turned toward the avenue. By pulling out the cages that had been pushed back to inclose the ratel the avenue was now opened and a few pokes started the animal on the way that ended in the trap. The ratel makes a hoarse rattling sound in its throat, which, together with its snarl, would do credit to a leopard. It was fed on raw meat, dead birds, and mealie meal porridge mixed with black treacle.

CIVETTICTIS CIVETTA ORIENTALIS (Matschie)

EAST AFRICAN CIVET

Native names.—Fungo (Chigogo); Fungo (Kiswahili).

Taken at Dodoma, Kondoa Irangi, Shinyanga, and Tulo. The Kondoa Irangi specimen was fed on meat, groundnuts, and papaw; it would not touch pumpkin. Its cry, given just after dark and at

intervals throughout the night, was very harsh yet catlike. The Dodoma civet was a big animal, box trapped with a goat head and entrails as bait; it was very fierce and dashed against the bars or gnashed on them before it was brought in.

GENNETTA DONGALANA NEUMANNI Matschie

NEUMANN'S GENET

Native names.—Nghanu (Chigogo); Kanu (Kiswahili).

A dozen genets were brought in at Dodoma, Kondoa Irangi, and Tindi in Shinyanga. They were fed principally upon chopped meat, varied occasionally by small birds or rats. In the morning they were provided with milk (of which they were very fond), and in the evening with water. I found it advisable not to keep more than two in a cage on account of their fierce disposition and the difficulty of cleaning the cage. A box containing two adults and a kitten was sent in from Kondoa Irangi; on arrival it was found that the adults had presumably killed and most certainly eaten the whole of the kitten except the tail and the rump around the scent glands. Another time when two adults occupied the same cage with a kitten they murdered it, though they did not eat it. A member of our party—S. Haweis—received a very severe bite from an adult genet, which held on for more than a minute; in fact its jaws had to be pried open before it would relax its grip.

HERPESTES (CALOGALE) FLAVIVENTRIS (Matschie)

OCHRACEOUS MUNGOOSE

Native name.—Muloli (Chigogo).

When first brought into our camp at Dodoma this handsome yellow little mongoose was very savage. While food was being placed in its cage or bedding removed it showed great activity, darting about the cage in every direction. Later it learned to come to the netting to take food from one's fingers, but I should hesitate to trust it with my fingers inside the cage.

HERPESTES (CALOGALE) GRACILIS LADEMANNI (Matschie)

BLACK MUNGOOSE

Three were brought in at Dodoma, and two of these, after spending two months in captivity, escaped; one was recaptured a week later, having entered an outbuilding; he left again a few days afterwards. All were fed on minced raw meat, eggs, and milk, and remained fit and fierce.

ATILAX PALUDINOSUS RUBESCENS (Hollister)**WATER MUNGOOSE**

Originally caught by Mr. Runton and his boys at Mbulu, this mungoose arrived with a great reputation for ferocity, which his attitude justified. After about three and a half months' captivity, having discovered that the function of mankind was to feed him, he became tolerant and learned to drink out of a saucer without interfering with the fingers at the other end. His appetite was enormous; occasionally he overstepped even its limits and was then disgustingly sick. This happened three times in three months and a day's starvation with plenty of water was all that he required to enable him to recover the health of which his sleek and glossy coat bore witness. He would reach into a wire rat trap, scoop out the occupant, and crush its skull in a matter of seconds. An animal which I believe was a water mungoose was sighted by Mr. Haweis and myself near the swamp at Nzingi.

ICHNEUMIA ALBICAUDA IBEANA (Thomas)**EAST AFRICAN WHITE-TAILED MUNGOOSE**

Native names.—Nghungangombe (Chigogo); Chonjwe (Kiswahili).

A half-grown specimen brought in during May would only eat raw meat and drink milk; of the latter he was exceedingly fond, drinking nearly half a pint daily, but milk puddings or rice he ignored.

When a hand was put into his cage he gave vent to a long drawn-out screech which terminated with a dab or snap at the offending hand. Protected by a glove, I daily rubbed his ears or stroked his head; nevertheless he would maintain his outrageous screech the whole time.

An adult female, also taken near Dodoma, measured 500. 500. 120. 30 mm.

HELOGALE UNDULATA UNDULATA (Peters)**LESSER MUNGOOSE**

Native name.—Sala (Chigogo).

Only two specimens came to hand, one at Dodoma and the other at Kondoa Irangi. They were fed on milk, minced meat, and occasionally eggs, a diet which appeared to suit them perfectly. They were quiet little animals, retiring to a corner of their cage and chirruping when food was being put in or during cleaning operations.

MUNGOS MUNGO COLONUS (Heller)**BANDED MUNGOOSE**

Native names.—Nghalasangana (Chigogo); Ngutchiro (Kiswahili). Seen at Nzingi; very abundant at Mukwese and Saranda.

Four banded mongoose were brought in at Dodoma and a fifth from Shinyanga. One of these escaped permanently. All of them got loose a great many times, mainly owing to the carelessness of native attendants in leaving the door catch unfastened. The mongoose apparently tested the door every time it was opened, for they never seemed to lose an opportunity of which they could take advantage. They lifted the door by pressing their noses against it. I am not sure that one alone could escape, for generally a second animal was required to slip its claws underneath and raise it further. One large mongoose bit through the wire netting several times, but doubling the net dissuaded them from further experiments in that direction. With the solitary exception already mentioned, they never went far, almost invariably retiring behind their own stack of cages and remaining there until disturbed. Then generally ensued a wild chase around the room. Their dietary was minced meat, eggs, milk, and water; the latter they habitually upset by pawing at the pan, so that it became necessary to hold it while they drank.

Fleas (*Ctenocephalus felis*) were removed from one.

Measurements of male, 385. 240. 80. 20 mm.

CROCUTA CROCUTA GERMINANS (Matschie)

EASTERN SPOTTED HYENA

Native names.—Mbisi or Mvisi (Chigogo); Fisi (Kiswahili).

Four hyenas were trapped at Dodoma and one at Kondoa Irangi. The bait was tied to a peg which released another peg that took the weight of the door so that the latter dropped instantaneously when the bait was grabbed. Our first hyena howled at nights and this drew many callers about the house. On moonlight nights they might be seen standing or sitting and calling to one another in sympathy. An old one accompanied by a puppy were very regular in their appearance and would sit 50 feet from the cage in which their confederate was confined. The captive whimpered and yelped like a dog and scrambled at the bars in his excitement. These demonstrations ceased after two more hyenas were introduced into the cage, when by day all would lie in a lazy pile at the back of the den for all the world like so many dogs. When first confined the larger ones resented the raking out of their bedding by seizing the rake in their powerful jaws or making rushes at the bars to the accompaniment of deep-throated growls or rumblings. Seemingly realizing the futility of this conduct they would retire to the back of their cage and turn their heads down and under in a characteristically hyenalike position of abject fear. Three lived in greater harmony than two, for when there were two the big Kondoa beast bit or bullied the young Dodoma animal toward dawn—that is, after 4 o'clock and before 6.30 o'clock—then the young ones would yelp and I

would hasten out in my pajamas and wallop the bully, or hang a lantern in front of the cage. A light always had a quieting effect. The young hyena was not so shy and would come to the bars and lap up water within a foot of me. Woe betide the water dish (whether heavy aluminum or stout enamel ware) which was left in their cage overnight; morning had nothing but some shreds of metal to show for it.

Apart from this vice I considered the hyena party my best friends and, with the exception of their dawn disputes, the least troublesome animals to look after. Any bones, skins, or entrails left in the leopard cages were always transferred to theirs. Any diseased animal that died was soon buried if handed over to them.

They had enormous appetites, but they lived well, nevertheless.

FELIS LEO MASSAICA Neumann

EAST AFRICAN LION

Native names.—Simba (Chigogo); Simba (Kiswahili).

Lions were never heard for certain during our four months' stay at Dodoma, though visiting lions were not uncommon at Kikuyu (1½ miles south), where they killed cattle from time to time. Six miles east they were a good deal in evidence by the Greater Kudu kills, and the only time I was out in that direction I came upon the stomach contents of an ox quite close to a large village whose inhabitants said a lion had killed there at noon the previous day.

FELIS PARDUS SUAHELICA Neumann

EAST AFRICAN LEOPARD

Native names.—Suwi (Chigogo); Chui (Kiswahili).

Four leopards were trapped at Dodoma and one at Kondoa Irangi; three of these Dodoma leopards were taken in six days or the second week after the traps had been set. The cage trap was placed against a "boma" (thorn zareba) containing a live goat plainly visible to a prowling leopard who, if he entered the cage and approached the bars, would tread on a plank connected with a peg as in the hyena trap previously mentioned. During the last fortnight one leopard and three hyenas were taken in four traps set on the same spot. The ferocity and wrath displayed by freshly caught adult leopards are quite appalling, and to prevent such animals injuring themselves on the bars it was found necessary to cover these with sacking for the first couple of weeks, as anyone looking in or passing by caused a fresh outburst of rage.

Their food was always killed before being put in, and consisted chiefly of bullock and goat flesh, varied by guinea fowl. It was interesting to observe how neatly a guinea fowl was plucked before

being eaten. Holding the bird in its claws the leopard would remove mouthful after mouthful of feathers which would be laid in a neat pile similar to others composed of bustard's feathers which I saw in the bush at Saranda. Similarly if given a whole dikdik the stomach and entrails would be removed and laid on one side. Curiously enough, while bush fowl were relished, duck would not be touched by any of the leopards, which were presumably unacquainted with them. One fine male, taken at Kikuyu, refused both monkey and baboon, but this was certainly a personal idiosyncrasy not shared by his companions in captivity. A dead python cut in half was also rejected by the two leopards to which the pieces were offered.

While staying at Nzingi station one of our boys reported seeing two leopards at daybreak as they trotted down the line. Local natives said it was a daily occurrence, as they came to drink at a water hole close to the station. At Kilamatinde I saw one in the road one morning, and at 3 o'clock on Sunday afternoon a pack of baboons on the hillside opposite the "boma" gave tongue and acted as if they had been molested by one. In the same way, but at 9 o'clock in the evening, guenons raised an outcry in the trees at the back of the house at Saranda where leopards were quite a pest. The second night I was there, one carried off a calf out of a shed, the little creature had only been born that afternoon. Mr. Robbie pointed out the skeleton of another calf hanging in the fork of a tree at a height of 20 feet from the ground and perhaps 50 yards from the cow shed. In that instance Mr. Robbie set a gun trap at the foot of the tree, thereafter the leopard's skin adorned Mr. Robbie's house and the calf's carcass was left in the tree.

FELIS CAPENSIS HINDEI Wroughton

EAST AFRICAN SERVAL

Native names.—Nzuli (Chigogo); Kizonga (Kiswahili).

Seven servals in all were received by the expedition. Two of these were adults, gin trapped by natives close to Dodoma. Three were kittens, of which one came from Kizumbi, near Shinyanga; another from Arusha was presented by Mr. Montague of the game department, and the third was bought at Kondoa Irangi. All were about the same size and were received during July and August, but while the Kizumbi and Kondoa animals might be freely handled and were allowed to run loose about the camp, the Arusha serval was irascibility personified, spitting and slapping with extended claws at anyone approaching.

It was an amusing sight to see these kittens wrestling with their milk bottles—ordinary liquor bottles fitted with a teat. Standing on their hind legs, each with its forepaws around the bottle's neck, they would growl and struggle with the teat most ferociously. On

the arrival of our train at Dar es Salaam Mr. Charlton wished to obtain a photograph of one of them. Abedi, in whose charge it was, removed it from its cage; while not far away was a crowd of about 50 natives who could be heard discussing it as a "young leopard," etc. Suddenly the tiny kitten broke loose and cantered toward the crowd, which gave back; a youth, however, who was about 17 years of age, completely lost his nerve and took to his heels down the line, with the diminutive feline in full pursuit. After doing 30 yards to his 60 she became tired and sat down to rest. The incident evoked peals of laughter from the remaining onlookers.

FELIS OCREATA UGANDAE Swann

UGANDA WILD TABBY

Native names.—Mvugi (Chigogo); Paka wa pori (Kiswahili).

Two wildcat kittens were brought in during May, both taken near Dodoma. An adult was sent in from Kondoa Irangi and F. G. Carnochan obtained a dozen kittens from the Shinyanga subdistrict. Two of these were half-castes, one of their parents being a domestic cat, the young having patches of white upon them. All displayed great ferocity, spitting and striking incessantly when food was put into their cage or on any other occasion when their cages were approached; apparently it was second nature to them to do so and so they they did it, however irrational. No deaths occurred among them; all were given milk and chopped raw meat, the latter occasionally varied by mice or small birds when these were available.

LYNX CARACAL NUBICUS (Fischer)

EAST AFRICAN LYNX

Native names.—Mangu (Chigogo); Simba wagi (Kiswahili).

F. G. Carnochan purchased a kitten from natives at Kizumbi which was still alive at time of embarkation, its diet being minced raw meat and milk. The Shinyanga region appears to be one of the few places in Tanganyika Territory where the lynx is tolerably common, judging from Mr. Carnochan's experience. Salimu tells me that "wagi" refers to its color, which they compare to the buffalo bean ("wagi" in Kikami, a word adopted by the Swahili).

SMUTSIA TEMMINCKI (Smuts)

PANGOLIN

Native names.—Nyamungumi (Chigogo); Kakakuona (Kiswahili).

One of these curious armor-plated creatures was brought into Dodoma early in June and was still alive at time of embarkation, though it should surely have died before then. At first it was fed on minced raw meat and boiled rice, but it ate so little of the latter that the rice was dropped. It occurred to me that boiled eggs and

boiled meat minced together might adhere to its sticky tongue better than raw meat. The change was greatly appreciated and the pangolin ate tremendously for a time, then dropped back to about a cupful each night, a quantity which seems extraordinarily little for an animal of its size. It frequently protruded its long wormlike tongue through the wire screening of its cage and it drank water by putting its tongue into it continually. It spent much time in clawing at its cage in an endeavor to escape. The species also occurs at Manyoni.

BUBALIS COKEI subspecies

COKE'S HARTEBEEST

Native names.—Bwindu (Chigogo); Kongoni (Kiswahili).

As the Wagogo always assert that hartebeest do not occur in Ugogo I was surprised to see a solitary specimen some 3 miles north of Mukwese (near Manyoni). I obtained a clear view at 200 yards distance.

CONNOCHAETES TAURINUS HECKI Neumann

WHITE-BEARDED GNU

Native names.—Nghongolo (for wildebeest in Chigogo); Nyumbu (Kiswahili).

The four young animals which Doctor Mann's party captured at Mbulu, Arusha, were transported in safety by Chrysler car to Dodoma at the end of May. A month later one of them succumbed to eruptions from which it was suffering at the time of its capture; the others all survived. They were fed on grass, usually rather too dry, and this was varied by potato tops during the last month. All attempts to get them to take mealie meal either with or without milk failed for some time. Doctor Mann soon discovered their liking for Quaker Oats and so they were given two tins of this daily for a long time. Later we tried mixing maize meal with it; at first they refused the combination, then sought to select the oats, but eventually took to eating the mixture, which by very gradual degrees, extending over a month, was so altered that finally the oats were entirely eliminated and the animals took the mealie flour neat. At first they drank two whole washbasins of milk daily, but as they grew older they took more water and less milk. The ailing animal liked having its head rubbed and would approach me to be fondled, but the other three resented all overtures, characteristically kicking up their heels and bounding away.

Ticks (*Rhipicephalus appendiculatus*) were found on the ears of one of these wildebeest.

Measurements of a young male were 45½ inches, 10½ inches, 15 inches, 7 inches.

**CEPHALOPHUS GRIMMI GRIMMI* (Linnaeus)

COMMON DUIKER

Native names.—Haluzi (Chigogo); Funo (Kishwahili).

I saw half a dozen duiker at Nzingi, Saranda, and in the vicinity of Dodoma. Several young ones were brought into camp at Dodoma during May and June and others from Kondoa Irangi and Shinyanga in August, showing a very extended breeding season, as all were about the same age. An adult female which arrived from Kondoa Irangi during the first week in August was with young.

I had one of the Dodoma duikers combed for fleas (*Ctenocephalus felis*) during June.

Measurements of male, 1054. 61. 264. 108 mm. (Mukwese).

MADOQUA KIRKI NYIKAE (Heller)

THORNBUSH DIKDIK

Native names.—Mzimba or Chizimba (Chigogo); Paa (Kishwahili).

The pronunciation of the Chigogo name for this species varies in different sections of the district. Dikdik are extraordinarily common, even quite close to Dodoma, and on my first three walks in the vicinity I put up three dikdik on each occasion. I saw several at Nzingi and Mukwese, where it is not so abundant. At Saranda it is very plentiful. At least a score of newly dropped young were brought in during May, June, and July. None of these lived more than a fortnight, either through the curdling of the cow's milk in their stomachs or through diarrhea. The last received during the first week in August was kept in a cool ill-lighted room and fed on cow's milk diluted with equal parts of water three times a day. It thrived, began nibbling grass, and in due course was taken to Dar es Salaam. This little animal always slept with a serval kitten, which, in the daytime, would spring on its back or cling round its neck in an attempt to throw it, making a fine miniature scene of a leopard with an antelope. The dikdik stood this treatment quite placidly and showed no fear whatever, even going up to rub noses with the serval. The Zanzibar lemur would sometimes join the party and seize the serval's big ears or prance around on its own long hind legs in a grotesquely ludicrous fashion. In captivity the dikdiks ate maize flour, mimosa pods, mimosa leaves, and showed considerable fondness for the green tops of potatoes and beans. Most of the native garden plots at Mukwese are guarded by felled hedges, at intervals along these are set well-made deadfall traps presumably for dikdik; at least I can hardly imagine anything much larger venturing through the narrow aperture.

Fleas (*Ctenocephalus canis* and *felis*), ticks (*Rhipicephalus appendiculatus*), and worms (*Setaria labiadao-papillosa*) were collected from Dodoma dikdiks on June 11 and 26, 1926.

* *RAPHICEROS CAMPESTRIS STIGMATICUS* (Lönnberg)

STEINBUCK

Native names.—Not known (Chigogo); Dondoro (Kiswahili).

I could never get the correct Chigogo name for this species, always being given that of the duiker or oribi instead. Two young ones were brought into Dodoma in June and a third from Mbulu in May. The latter died from pleurisy, the former from undiagnosed causes, but all had numberless fleas upon them, though they lived in an open paddock.

Fleas (*Ctenocephalus felis*) were collected on one of these bucks at Dodoma on June 27, 1926.

REDUNCA REDUNCA TOHI Heller

REEDBUCK

Native names.—Mpunzu (Chigogo); Tohi (Kiswahili).

Reedbuck were also kept with some degree of success. On May 20 I saw a pair owned by the station master at Bahi. The brown male was very young and he had only had it for about a week. The reddish female was nearly twice its size and was grazing at large, though still being given nine medicine bottles of milk daily; these it sucked through a piece of football rubber wound around the neck of the bottle. So eager was it for its milk that the sight of the bottle at feeding time would send it racing to its owner and vigorously attacking the back of his knees.

At Bahi I bought two young males, but both had diarrhea and one died the same night. The other was fed on water and milk for one day, then given bismuth with milk on the second; this resulted in a complete recovery. A fortnight later I again left Dodoma for 10 days and on my return found the animal looking miserable with a second attack of diarrhea. Once more it reacted to the bismuth treatment and became a great pet. In the middle of August it was in high spirits, racing and jumping around its inclosure and chasing the crowned cranes for sheer mischief. I removed it to the antelope paddock, where, about the 25th of the month, it very suddenly sickened, with a heavy discharge of mucus running from its nostrils. It stood up continually, as if it found some relief in this position. There was no apparent temperature or other sign of a cold, and though everything possible was done for it, it succumbed on the third night after being taken ill.

In half an hour spent in the Bahi swamp I saw or heard nearly a dozen reedbuck, sometimes singly, sometimes in pairs. I walked to within 30 feet of one doe, which was either busy feeding or purposely kept her head down, though I could see her back from afar. When approached she plunged away for 50 yards through the knee-deep water, then stood calmly regarding us.

Another male reedbuck was obtained by Doctor Mann at Arusha; its pelt was more rufous than was that of the Bahi animal. It took milk in considerable quantities during the whole period of its captivity until it was shipped three months later. The milk was given it through a leather funnel shaped like a shoehorn, nor could the obstinate animal be induced to drink it in any more reasonable fashion, though its companion drank from a bowl. Like the Bahi reedbuck it became riotously persistent at feeding times and many a bowl of milk was knocked out of the attendant's hands. Reedbuck make delightful pets and are probably easy to rear when given individual attention.

Fleas (*Ctenocephalus canis*) were collected from a young animal taken at Bahi, May 21, 1926, and others (*Ctenocephalus felis*) on the same animal at Dodoma some few weeks later.

AEPYCEROS MELAMPUS SUARA (Matschie)

IMPALLA

Native names.—Mbata (Chigogo); Palla (Kiswahili).

Impalla occur 6 miles east of Dodoma township, where I have seen their spoor; the natives were aware of their presence. I saw one at Nzingi, which is due west of Dodoma, and half a dozen were seen not far from Saranda station.

A young one was brought in during July, but died within a few days. Later a pair were obtained at Kondoa Trangi by Mr. Runton and four females at Tulo by Doctor Mann.

Measurements of immature female, 700. 170. 305. 110 mm.

GAZELLA THOMSONI Günther

THOMSON'S GAZELLE

Native names.—?Mpunzu ?Nzera (Chigogo); Lala (Kiswahili).

I saw a single individual grazing on an open plain near Bahi in the Dodoma district May 20, 1926.

TRAGELAPHUS SCRIPTUS MASSAICUS Neumann

MASSAI BUSH BUCK

Native names.—Mbala (Chigogo); Mbarawara (Kiswahili).

I anticipated that we should get bush buck more certainly than any other species of antelope, but owing to the fact that the main activities of the expedition were not in bush-buck country it so happened that none was received until the collection was on its way to the coast, when Mr. N. C. Miller, of the game department, presented us with a very young animal found at Kilosa a few days previously.

STREPSICEROS STREPSICEROS BEA Heller

EAST AFRICAN GREATER KUDU

Native names.—Sichilo (Chigogo); Tandalla (Kiswahili).

Mr. George Runton captured two well-grown but still hornless male kudu at Kondoa Irangi. While one of these animals was on the way from Kondoa to Dodoma it was scared by a passing car and sprang out through the wooden end of its cage carrying all before it. Its cage was in the box body of the car at the time and the kudu made good its escape. The other fed on shrubs and potato tops, but as far as I could see did not touch grass.

This fine antelope is still fairly common quite close to Dodoma, herds being seen by me on several occasions. While their spoor was plentiful at Mukwese, only one animal was seen.

TAUROTRAGUS ORYX PATTERSONIANUS Lydekker

EAST AFRICAN ELAND

Native names.—Mhogologo (Chigogo); Pofu (Kiswahili).

A fine young animal was obtained at Kizimbi by F. G. Carnochan. It took six bottles of milk every day—two in the morning, two at noon, and two at night. It began to eat early in August. A herd of eland in charge of a magnificent bull were seen one afternoon at Mukwese.

GIRAFFA CAMELOPARDALIS TIPPELSKIRCHI Matschie

GIRAFFE

Native names.—Nhwigga (Chigogo); Twigga (Kiswahili).

Measurements of adult female, 13 feet 3 inches, 2 feet 10½ inches, 4 feet 8¾ inches. Saranda. When proceeding up country on May 10, 1926, many young giraffe were seen on Mkata plains. At Mukwese a solitary female and calf were met with in thorn bush and half a dozen adults with two yearling calves were encountered in an "mbugwe." It was at Saranda, however, that I saw the finest lot of calves I have ever seen. Mr. Robbie took me out to the acacia flats on the evening of my arrival and pointed out a herd some 400 yards away. We approached to within 200 yards and were watching them with glasses across a perfectly open "mbugwe" when a wart hog, totally unconscious of our presence, trotted past within 50 yards. The giraffe were a wonderful sight—15 or 20 of them and only 1 large bull. Several unaccompanied females strolled past, feeding as they went. They were followed by some of last year's young, then several more females accompanied by young ones only 6 feet high. The bull came last but two; the laggards were a yearling and a this year's calf. The variety of coloring was very striking, one young one being nearly white; on others the markings were reddish, while on

several they were rich sepia brown. There seemed to be a tendency to darken with age. Robbie estimated the age of the younger calves at 3 months (Saranda, September 13, 1926).

Ticks are always abundant on these big beasts and some (*Amblyomma gemma*, *Rhipicephalus* species, *Hyalomma aegypticum*, and *Ornithodoros moubata*) were collected at Mukwese near Manyoni.

EQUUS QUAGGA subspecies

ZEBRA

Native names.—Nhyenje (Chigogo); Punda milia (Kiswahili).

A zebra, purchased from Masai herdsman at Mbulu, was brought into Dodoma after a month's rest at Kondoa Irangi.

It was a tremendous feeder, consuming much green grass and regularly ate down the dry grass which formed one side of its hut. On the fifth day I had the hut constructed of inedible leaves and branches; these, though a poorer shelter than grass, afforded sufficient cover. Though three-quarters grown it was still very fond of milk, and would make short work of a washbasinful; it also took maize meal in a basin of water.

PROCAVIA BRUCEI PRITZWITZII Bauer

HYRAX OR CAVY

Native names.—Mhimbi (Chigogo); Pimbi (Kiswahili).

These hyraxes, formerly so common on the kopjes around Dodoma, are much more difficult to obtain now, as they have evidently been killed off for food quite extensively. Only about 10 were purchased locally, but many others were obtained at Bahi and Kondoa Irangi.

At first great difficulty was experienced in finding proper food; acacia thorn they would eat, but not heartily. Salimu then suggested the leaves of a locally grown bean and those of potatoes. Thereafter no further trouble was experienced, excepting the difficulty of procuring these leaves in sufficient quantities to appease the hearty appetities of 30 hyraxes.

Many species of worms (*Crossophoris collaris*, *Setaria* species, *Physaloptera* species) were taken from a Dodoma hyrax.

AVES

Familiar as I have been with large numbers of waterfowl on East African lakes like those at Singida, I have never seen anything quite so staggering as the flocks which were encountered near Bahi in May. South of the line are some extensive swamps covering miles of country; as the water recedes mud banks and spits of sand are exposed and on one such alone I approached within a hundred yards of a flock of pelican numbering between two and three thousand. When I came

too near they would run a yard or so to get impetus and then the whole flock would take off and fly a couple of hundred yards before settling again.

Palm trees in the distance were white with wood ibis, another species of which there were also many thousands; smaller flocks of sacred and glossy ibis, openbill, and spoonbill were also put up. During eight years in East Africa I have only seen half a dozen giant heron, but here in the course of an hour I saw a dozen, several of them rising with catfish (?) in their beaks. Gray heron, black-headed heron, squacco heron, great white, and other species of egret were abundant, while one saw not a few saddle-billed storks with wing spread of 8 feet—a bird one is accustomed to consider a rarity. Gulls and grebes were also present, but like the geese and ducks were not as plentiful as the pelicans and ibises. I recognized spurwing and Egyptain geese, knob-bill, redbill, and fulvous whistling duck. Fish eagles and other large birds of prey were represented.

For four and a half hours I sought for nesting sites but though old nests were found, those of this year I could not locate. The explanation given by the natives was that the provincial commissioner had given orders for all nests to be destroyed, as the presence of the birds was considered to interfere with the local industry in dried catfish. In consequence of this treatment the birds were now nesting farther back in the wilderness of swamps in places unknown to the Bahi natives.

CHLIDONIAS LECOPAREIA sclateri Mathews and Iredale

TERN

A male was shot and preserved in spirit. Several which were seen flying over the swampy "fields" or flooded areas looked very out of place among the green grass. To judge by their behavior one pair almost certainly had their nest among the grass tussocks standing out of the water. (Nzingi, 25. v. 26.)

STRUTHIO CAMELUS MASSAICUS Neumann

EAST AFRICAN OSTRICH

A native brought in a well-grown but immature ostrich, a species of which I saw a large drove near the Bahi swamps just mentioned.

This bird was taken out to graze and feed every day and returned to its inclosure during luncheon hours. One day some one inadvertently left two crowned cranes in this "boma" and on my going out to see how the ostrich fared I found it standing with one foot on a crane which it was eating alive. As I paused in astonishment it tore off another piece of flesh and gulped it down, its bill dripping blood. The sight brought to mind pictures of dinosaurs of old feeding on their victims. (Dodoma, v. 26.)

ANAS ERYTHORHYNCHA Gmelin

REDBILL OR AFRICAN PINTAIL

Three young birds, just able to fly, I think, have just been brought in from Malenga. One met death at the beak of a sacred ibis, the others fed well on chopped meat and rice submerged in water in a soup plate. (Dodoma, 1. vii. 26.)

THALASSORNIS LEUCONOTUS LEUCONOTUS Eyton

WHITE-BACKED DIVING DUCK

Twenty-three young birds were brought in from Nzingi during the middle of August; the diet of minced meat and boiled rice in water did not suit them.

DENDROCYGNA FULVA (Gmelin)

FULVOUS TREE DUCK

Common on the swamps at Nzingi and Bahi in May, black duck (*?Anas sparsa* Eyton) and many other species were also seen, almost invariably in pairs. (20-26. v. 26.) As they were unaccompanied by young, I concluded that they were not nesting as yet, certainly not sitting, for the females accompanied the drakes. Two nests which I found looked like old duck nests, however.

ALOPOCHEN AEGYPTIACUS (Linnaeus)

EGYPTIAN GOOSE

Seen at Bahi in May.

During the last days of June an adult and two young birds were brought in, the woolly necks of the latter looking very scraggy. Both the young birds died, presumably through competition of the older birds in the run. (Dodoma, vi. 26.)

SARKIDIORNIS MELANOTUS (Pennant)

KNOB-BILLED GOOSE

Very abundant and extraordinarily tame at Nzingi in May (24-26) where a flock of 20 permitted one to approach within 30 to 50 feet.

A single bird in an exhausted condition on being brought in was put in an inclosure to see if it would recover, which it did, flying away between dusk and dawn. (Dodoma, vii. 26.)

PLECTROPTERUS GAMBENSIS GAMBENSIS Linnaeus

SPUR-WINGED GOOSE

Six birds were obtained from the missions at Bahi and Kilamatinde, whither they had been taken by natives. The big birds have ravenous appetites, consuming large quantities of meat and rice, which are

furnished in a washbasin, the food being submerged in water. They also exhibit a liking for "mtama," heads of which are scattered on the ground in their inclosure.

This goose is such an arrant bully that it is not advisable to keep it in the same pen with smaller species; even young of its own kind lead a very precarious existence, for not only do the semiadult geese peck at any bird approaching when they are feeding but they will drive such away from the food even when they themselves have no inclination to eat. As if this were not enough, they are addicted to giving a peck in passing to the Egyptian geese and sacred ibis which perforce share the run.

Four almost adult birds were brought in during August, mostly from Nzingi, where I saw an adult on May 25. (Dodoma, vii. 26.)

BALEARICA REGULORUM GIBBERICEPS Reichenow

EAST AFRICAN CROWNED CRANE

About two a day were seen feeding in the native "shambas" at Nzingi in May. From the day of our arrival here on May 5 to the last day in July, young crowned cranes lacking the black velvet cap have been brought in at intervals of about 10 days with great regularity. Ten in all were received, the last, which arrived on July 31, having some black velvet feathers on the crown. Those received early in May were obviously only recently out of the nest, as they were scarcely able to fly. One met death at the beak of an ostrich, as previously related, while two, though able to stand and walk about when they were brought in, collapsed during the night and never recovered the power in their legs; they fed from a dish placed in front of them, but both succumbed after four or five days. The remaining seven did well in a small inclosure where they were fed exclusively on boiled rice and raw chopped meat submerged in water in an ordinary washbasin. They drank frequently from a big bowl of water which was always kept in their paddock, and often stood in the water when not engaged in picking about their quarters, which they do much after the manner of fowls. Most of the birds came from Nzingi and Bahi. (Dodoma, 5. vii. 26.)

A very young bird was brought in, being much less advanced than the Dodoma birds, hatched quite two months later, one would suppose. (Kondoa Irangi, 13. vii. 26.)

THRESKIORNIS AETHIOPICUS AETHIOPICUS (Latham)

SACRED IBIS

Sacred ibis were abundant at Bahi and Nzingi, but as I could detect no woolly necked young birds among them I concluded that they had not nested as yet.

Two of these birds were brought in early in May and contrary to expectations survived on a diet of boiled rice and chopped meat. One was little more than a fledgling, having been taken at Kiva Mtango on May 15, 1926, and still had all its neck feathers. (Dodoma, 31. viii. 26.)

* *ARDEA MELANOCEPHALA* Vigors and Child

BLACK-HEADED HERON

Strange to say, this was the only heron of any kind brought in during the whole trip. (Dodoma, 10. viii. 26.)

ANASTOMUS LAMELLIGERUS LAMELLIGERUS Temminck

AFRICAN OPENBILL

A fledgling was brought in from Mtangalala near Dodoma May 13, 1926, but it only survived a few days, though offered chopped meat in water. Common at Nzingi and Bahi.

* *CHARADRIUS VENUSTA VENUSTA* Fischer and Reichenow

PLOVER

A plover, kept in a cage with black rails, did well on boiled rice and minced meat. (Dodoma, vii. 26.)

STEPHANIBYX CORONATUS (Boddaert)

CROWNED LAPWING

The crowned plover is very common at Dodoma in May and June but appears to leave the vicinity as desiccation proceeds. Their cries at night were a considerable item of the nocturnal disturbances in May. Three birds survived in the bush-fowl run, apparently subsisting entirely on minced meat. The first birds brought in all died, either as a result of being snared by the leg or being confined in a box cage. (Dodoma, vi. 26.)

LIMNOCORAX FLAVIROSTRA (Swainson)

BLACK RAIL

About half the number caught survived when supplied with raw chopped meat and boiled rice, but whether they actually ate the rice I can not say. (Mbulu, vii. 26.)

SAROTHRURA ? species

RAIL

Three rails were brought in, one of which succumbed within a day or two; the others remained fit and well on a diet of rice and papaw, which they were never seen to take, as they apparently fed at night. They were active and stood captivity well, their plumage always immaculate. (Dodoma, vi. 26.)

GALLINULA CHLOROPUS BRACHYPTERA (Brehm)

AFRICAN MOOR HEN

Found 20 nests of the year all vacated by young except two. In one of these was a single addled egg, which I preserved. In the other were five hard-set eggs, which I left. All the nests except this last one were built in tussocks of grass; the last was in the fork of a shrub about 6 inches above the water, which was 4 feet deep; there was no grass within 10 feet of the site. (Nzingi, 26. v. 26.)

During the second week in May I saw a downy young moor hen swimming in the large pond near the golf links. A slightly larger youngster was brought in between May 12 and 15, but was too injured to keep. Toward the end of the month this was followed by an adult bird which was put in a spacious guinea-fowl run where it huddled in the corner all day, never venturing to enter a basin of water that was provided. It evidently fed at night when the guinea fowl roosted, for it survived and was joined by a half-grown, gray-plumaged bird and the two of them transferred to an inclosure occupied by small buck. Here the pair of them fed on rice (? and meat) submerged in milk. When anyone approached they raced up and down inside the wire netting scrambling over the buck with their sharp claws so that I deemed it advisable to remove them to an inside room pending the building of a water-fowl run. In this location they were equally at home, rarely entering the water but scurrying over the grass-strewn floor. The adult bird, finding it could pass through the bars of a large cage containing a pangolin and a jumping hare, took up its abode in the dark recesses of the cage, only issuing forth to feed at night. (Dodoma, vi. 26.)

Of four adult birds brought in only two survived; possibly they had been injured during capture or exposed to a hot sun. The Wagogo display a total lack of common sense in such matters. (Dodoma, 1. viii. 26.)

NUMIDA MITRATA REICHENOWI Grant

REICHENOW'S HELMETED GUINEA FOWL

Purchased two hatchings from native youngsters who had reared them under hens; there were five in one lot and four in the other. They are very fond of grasshoppers but reject a hard-shelled dung beetle (*Macropoda tuberculifera* Kolbe)³ that is locally common. During the three days here—and I have been constantly in the bush—I have only seen two coveys of the birds, both were large ones, however. (Nzingi, 24–26. v. 26.)

³ My thanks are due to Mr. Archer for this determination.

These guinea fowl, though now scarce in the immediate vicinity of the town, are very abundant elsewhere and the Wagogo are well versed in snaring them by the leg. Many of these birds are brought to the market, where they are sold at sixpence each, but either through having been left in the snare too long or subsequent rough treatment an appreciable percentage of the birds are lame. When a fresh arrival is introduced into a run containing guinea fowl the old inhabitants almost invariably attack, pecking it so viciously on the head as to frequently kill it outright. It is very necessary, therefore, to watch over a new bird until the attention of the others has been distracted by feeding or some other diversion. "Mtama" and "uwele," with a moderate amount of chopped or minced meat, was given them, but unless very hungry they did not appear to care for rice. Green potato tops are greatly appreciated, the leaves being soon stripped from the stems. (Dodoma, vi. 26.)

Scarce at Mukwese, though several large flocks from 20 to 30 individuals were encountered several miles out from the hamlet. (Mukwese, 4. vi. 26.)

GUTTERA GRANTI Elliot

GRANT'S CRESTED GUINEA FOWL

These birds occur along the well-wooded slopes of the Rift Valley escarpment, quite close to the station, while the helmeted guinea fowl occupies the "shambas" and thorn bush of the plains; the crested birds do visit the "shambas" at times, however, and four were snared by the natives. In captivity they show a greater preference for minced meat than the helmeted species; "mtama" formed their staple food. The cry is most peculiar, not unlike the noise of a watchman's rattle.

"Ugogo" is the type locality for this species, which Sclater considers a doubtful form of *G. plumifera* (Cassin). (Saranda, 15. vii. 26.)

PTERNISTES LEUCOSEPUS ?INFUSCATUS Cabanis (or ? BOHMI Reichenow)

EAST AFRICAN BARE-THROATED FRANCOLIN

Half a dozen of these handsome birds were received and fed on boiled rice and minced raw meat. (Dodoma, vi. 26.)

*FRANCOLINUS HILDEBRANDTI FISCHERI Reichenow

It was a surprise to have a couple of these large francolins brought in from the Dodoma district. Later I was almost certain I saw several on the road between Saranda and Kilamatinde. The food supplied them was similar to that provided for the last species. (Dodoma, vi. 26.)

FRANCOLINUS SEPHAENA GRANTII Hartlaub

GRANT'S CRESTED FRANCOLIN

More than 50 of these little partridgelike francolin were brought in. They took to captivity very naturally, though when confined in boxes—perhaps because of overcrowding or dietetic deficiency—they picked the feathers off each other's heads and necks till they were quite bare. When turned out into a run they ceased this vice. For the first few days in the run, however, many of them poked their heads against the wire netting until they bled all round the bases of their beaks. A month later some of them had scratched a hole under the wire netting and strayed out to the larger inclosure surrounded by piled-up thorn bush. Here a score of them were discovered, scratching and feeding, by a native whose sudden appearance caused them to rise in a covey and fly over the 6-foot high inclosure away to the open thorn bush. The astonishing thing was that at sunset most if not all of them flew back into the thorn inclosure and were found running round their wire-netted "home," trying to get in.

With three exceptions all were recaptured the same night; of the others, one was killed and eaten by some unknown carnivore; the remaining two were caught next day. (Dodoma, vi. 26.)

Three days ago disease appeared among these francolin, but does not seem to be spreading to the bustard, guinea fowl, or other occupants of the run. On the first day two died, yesterday six, to-day four. It appears to be an infection of the mouth which makes them disinclined to feed; this is followed by blindness in one or both eyes. (Dodoma, 14. viii. 26.)

Grant's francolin are very plentiful here and have astonished me by the way they will remain squatting in the grass. On one occasion I paused with two natives to examine a herd of giraffe. We crouched in short grass for five minutes, and it was only as I rose to go that a brace of bush fowl whirred away. The whole time they had been within 4 feet of us. The stomach contents of two birds were examined and found to chiefly consist of small reddish and very hard seeds, together with some green matter and an admixture of insects' (? termites) legs. (Saranda, 14. vii. 26.)

EUPODOTIS CANICOLLIS CANICOLLIS (Reichenow)

WHITE-BELLIED KNORHAAN

Shot a cock calling at 9 o'clock in the morning. (Nzingi, 26. v. 26.)

A fine bird in beautiful condition purchased this week is doing well on chopped meat. (Dodoma, 7. viii. 26.)

LISSOTIS MELANOGASTER (Rüppell)**BLACK-BELLIED BUSTARD**

Three birds brought in are feeding exclusively, as far as one can see, on minced meat. (Dodoma, vi. 26.)

COLUMBA GUINEA GUINEA Linnaeus**SPECKLED PIGEON**

Common on the rocky kopjes in the vicinity of the town; owing to their depredations in the gardens of the natives a battue was organized some few years ago and their numbers considerably reduced. They seem hardy enough in captivity, eating "mtama" and "mweli", but doves can not be confined in the same cage, as the pigeons peck them to death. Even members of their own species are liable to attack if introduced into a cage of well-established birds. This happened to two pigeons brought in from Kondoa Irangi on July 12, 1926. (Dodoma, vii. 26.)

A speckled pigeon was twice flushed from its nest in a hole in a branch of a baobab perhaps 30 feet from the ground. (Saranda, 12. vii. 26.)

Two nests, on which the hens were sitting, were built on top of posts in the "boma"; one examined held two eggs. (Kilamatinde, 20. vii. 26.)

TURTUR CHALCOSPILOS CHALCOSPILOS (Wagler)**EMERALD-SPOTTED GROUND DOVE**

Many individuals were taken around Dodoma; a hardy species.

OENA CAPENSIS CAPENSIS (Linnaeus)**NAMAQUA DOVE**

I disturbed a Namaqua dove building at Dodoma early in July. A nest containing two fresh eggs was taken by Salimu on August 28, 1926. An egg laid by a captive bird at the same time measures 20 by 13 mm.

Our first experience with these birds was disappointing, as only one hardy male survived on a diet of "mtama." Later in August these doves began flocking and great numbers might daily be seen feeding on the ground about the house. The natives brought in quite a number and I put these on a diet of "uwele," the seeds being threshed from the head. Though this food did not seem ideal, many of the birds appear to be subsisting on it, though a month is rather too short a time to make sure that it will suffice. (Dodoma, 31. viii. 26.)

STIGMATOPELIA SENEGALENSIS SENEGALENSIS (Linnaeus)

LAUGHING DOVE

This, the commonest dove in the territory, was captured in great numbers at Dodoma and Kondoa Irangi. Only "mtama" and water were supplied them. When overcrowded they pick the feathers off each other's heads.

A nest containing two young was found at Dodoma in June.

STREPTOPELIA DECIPIENS PERSPICILLATA (Fischer and Reichenow)

MASSAI MOURNING DOVE

I found five nests of this species in bull's-horn acacia thorn standing in water in the large swamp. Each nest was 5 feet from the ground, which was approximately 2 feet under water. Typical doves' nests built in crotch of main trunk.

One nest had a single fresh egg; the second and third fresh clutches of two; the fourth contained two eggs very different in shape, one was fresh and the other held an embryo; the fifth nest held two hard-set eggs, which I left. (Nzingi, 26. v. 26.)

Another egg laid by a captive bird in August measured 30 by 25 mm.

In captivity they were given "mtama" and water, on which they did well. (Dodoma, 5. viii. 26.)

STREPTOPELIA CAPICOLA TROPICA (Reichenow)

EAST AFRICAN RING-NECKED DOVE

Not so common at Dodoma as the other species, but a dozen or so were brought in and thrived on a "mtama" diet.

TRIGONOCEPS OCCIPITALIS (Burchell)

WHITE-HEADED VULTURE

Brought in by an Mgogo native who had snared it the previous day. Almost immediately after arrival it took meat from forceps proffered by Haweis, though it was in a very small cage pending the making of a specially large one. It gulped down water as soon as it was put into the cage. (Dodoma, 3. vii. 26.)

MELIERAX POLIOPTERUS Cabanis

EAST AFRICAN CHANTING GOSHAWK

Salimu found a single nestling on a kopje at this place; it fed well on scraps of meat, but during my absence at Saranda in July it died and was replaced in the collection by another nestling taken near Dodoma, which never gained the full use of its legs, so I had to kill it. (Kikombo, vi. 26.)

Two full-grown birds in immature plumage were brought in during the latter half of this month, but did not agree in the same cage and had to be separated. (Dodoma, vii. 26.)

MELIERAX GABAR (Daudin)

GABAR GOSHAWK

Two of these birds were bought during July—cock and hen. The day before the latter was received the former escaped from its cage while it was being cleaned. The hawk flew out of the window and I never expected to see it again, but in the afternoon it returned, and, flying in at the door, sat on the floor in front of its cage, in which it was replaced without much difficulty. (Dodoma, vii. 26.)

A male shot at dusk had its stomach distended with meat, while a single black Hippoboscid fly was found among its feathers. (Saranda, 14. vii. 26.)

AQUILA RAPAX RAPAX (Temminck)

TAWNY EAGLE

A locally caught bird brought in to-day was placed in the same cage as another received from Kondoa Iranga on October 13, 1926. Both immediately erected their feathers with a very handsome effect, then the newcomer fell to on a plate of chopped meat. Rats and birds, however, were much more appreciated than meat. (Dodoma, 15. viii. 26.)

BUTEO RUFOFUSCUS AUGUR (Rüppell).

AUGUR BUZZARD

A single individual was brought in by a native; the species is tolerably common here in the vicinity of the kopjes.

The bird did well on a meat diet. (Dodoma, viii. 26.)

MILVUS MIGRANS PARASITUS (Daudin)

AFRICAN KITE

It is curious that only one representative of so common a species should have been taken, but such was the case, our solitary kite being sent in from Shinyanga by Mr. Carnochan.

ELANUS CAERULEUS CAERULEUS (Desfontaines)

BLACK-SHOULDERED KITE

Three nestlings were brought in and fed by Haweis on scraps of meat until they grew into fine birds, which kept themselves in beautiful condition. (Dodoma, 16. v. 26.)

Feeding time causes them to screech vociferously, raise their wings and ruffle their plumage even at this late date—July 6—when they look like adult birds, except for the immature mottling retained on breast and wings.

FALCO BIARMICUS BIARMICUS Temminck

SOUTH AFRICAN LANNER

An adult rufous crowned falcon arrived in the humiliating position of being crammed into a small chicken crate or native basket. For three days it refused food, though two rats were given it on arrival; then, finding the hunger strike of no advantage, it settled down to a diet of rats, small birds, or pieces of bullock meat which it seized upon with no delay or reluctance whatever. (Dodoma, 27. vi. 26.)

BUBO AFRICANUS AFRICANUS (Temminck)

SPOTTED EAGLE OWL

A bird brought in early in the week refused all food for three days, as far as one could see; then began eating rats. (Dodoma, 7. viii. 26.)

OTUS LEUCOTIS GRANTI (Kollibay)

SOUTHERN WHITE-FACED SCOPS OWL

Early in the month two downy nestlings were brought in which throve remarkably under Haweis' care. They were fed on fragments of rats and small birds or when these failed on scraps of raw bullock meat. By the end of the month they were able to tear up their own food.

At first these young birds were rather a noisy nuisance at night as they scrambled about on the wire netting and called, but gradually they settled down into a well-fed and somnolent respectability. (Dodoma, vi. 26.)

An adult brought in toward the end of the month refused to feed and though it was fed artificially for several days it succumbed on July 3. (Dodoma, vii. 26.)

TYTO ALBA AFFINIS (Blyth)

AFRICAN BARN OWL

A single bird received which frequently feeds at midday. The cry of this species was often heard around the house during May and June. (Dodoma vii. 26.)

Ten birds were brought in but are not feeding well on meat, though I have observed one eating in the daytime. Rats and a Grant's francolin were eaten readily enough, but it is difficult to obtain a sufficient supply of rats. (Kondoa Irangi, 13. vii. 26.)

POICEPHALUS MEYERI MATSCHIEI Neumann

EAST AFRICAN BROWN PARROT

A single locally purchased bird thrives. It is strange that more are not caught by the natives for they are common up and down the line, though not at Dodoma itself. Offering the munificent sum of 1 shilling for a bird has had no results. (Dodoma, vii. 26.)

AGAPORNIS PERSONATA Reichenow

YELLOW-BREASTED LOVE BIRD

Native name.—Quinzi (Chigogo).

When at Nzingi in May (24–26) a few of these birds were sleeping under the galvanized-iron roof of the station, having pecked out grooves in the supporting beam so as to facilitate their ingress and egress. Nests were observed, though these were probably old ones.

Hearing that love birds were numerous at Kikombo I sent Salimu down and he returned with half a dozen. Contrary to my previous experience they are very hardy if provided with heads of "mtama," from which they pick the seeds. They are no trouble to look after as they only need "mtama" and water. A perch in their cage is rather though not altogether superfluous, as at night they huddle into a corner in conformity with their similar habit, when in a wild state, of sleeping in holes in trees. They clamber about on the wire netting front of their cage more than on their perch and manage to keep themselves beautifully clean. The peck of one of these miniature parrots is to be respected, as it will draw blood.

While they are not rare at Dodoma itself, they are by no means common, for not more than half a dozen will be seen in any one day's walk. The few birds brought in during May and June died, owing to the treatment they had received at the hands of their Wagogo captors. (Kikombo, east of Dodoma, vi. 26.)

AGAPORNIS FISCHERI Reichenow

FISCHER'S LOVE BIRD

Very hardy in captivity, feeding like the last, adepts at escaping, and also in using their beaks to good effect. (Mbulu, near Arusha, v. 26.)

CORYTHAIXOIDES (CHIZAERHIS) LEUCOGASTER (Rüppell)

WHITE-BELLIED GOAWAY BIRD

A pair of young birds were brought in to-day; they were just fledged and apparently snared by the leg, for each had a leg broken or dislocated, so I promptly killed them. Two younger birds taken from the nest and brought in a week ago are doing well on papaw and banana (?) and rice. (Dodoma, 27. vi. 26.)

Died a month later.

An adult brought in four days ago had its leg strained or otherwise injured, presumably by the snare; it never recovered. (Dodoma, 7. viii. 26.)

CENTROPUS SUPERCILIOSUS LOANDAE C. Grant

CENTRAL AFRICAN WHITE-BROWED COUCAL

LAMPROMORPHA KLASSI (Stephens)

WHITE-BREASTED EMERALD CUCKOO

INDICATOR INDICATOR (Sparrman)

BLACK-THROATED HONEY GUIDE

TRICHOLAEMA LACRYMOSUM LACRYMOSUM Cabanis

SPOTTED-FLANKED BARBET

None of the foregoing survived many days. The single coucal from Bahi had had its flight and tail feathers plucked out; the honey guide seemed ill. A pair each of the emerald cuckoos and barbets were brought in.

TRICHOLAEMA DIADEMATUS MASSAICUM (Reichenow)

MASSAI RED-FRONTED BARBET

Two birds, when brought in to-day, promptly attacked some papaw fruit which was placed in their cage. (Dodoma, 5. vii. 26.)

But, like their predecessors, did not survive long. (Dodoma, 14. vii. 26.)

TRACHYPHONUS EMINI Reichenow

EMIN PASHA'S BARBET

Last month fully 50 of these handsome, cheery birds were brought in; they lived a few days, but invariably died. About the middle of June we refused to buy any more and then found that there were a dozen hardy survivors eating papaw, banana, tomatoes, and rice. The reason for the grievous mortality may be attributed to the mode of capture; these birds sleep, and are said to nest also, in burrows with a vertical shaft. The natives pour water into these holes until the half-drowned occupants are forced to emerge. This must naturally take place either late at night or in the early morning, when it is very cold at this altitude (3,700 feet). As these birds feed readily enough when brought in, one may reasonably suppose their subsequent death is due to chill. They are extraordinarily active, and it is a matter of no little difficulty to open a cage without one or more escaping.

As mentioned elsewhere,⁴ I once found this species nesting in a hollow tree at Dodoma, but as such are scarce in thorn scrub, and

⁴ Proc. Zool. Soc. 1922, p. 853.

the bird is very abundant, it seems highly probable that the species does nest in the ground. It brings to my recollection a statement made by Mr. D. W. Bisshop, in a letter to the game warden, which was written from somewhere in the vicinity of the Pare Mountains. He said that while walking along the road he was surprised to see a bird about the size of a thrush, but which he thought was a woodpecker, alight in the road and vanish from sight. On reaching the spot he found a vertical hole in the flat ground and on applying his ear to the entrance could distinctly hear the cheeping of nestlings.

Of course such a mode of nesting is only feasible in a dry region where the absence of rain may be depended on. (Dodoma, vi. 26.)

COLIUS MACROURUS PULCHER Neumann

BLUE-NAPED COLY

Great numbers of these handsome little long-tailed mouse birds were brought in; at the time of writing we have 60 in one cage. They do not make good cage birds, owing to their habit of clustering together and dropping over one another's plumage until they get into an appalling mess. In an aviary they would doubtless keep clean and look more attractive, as they are excessively hardy. It was a pitiful sight to see these docile little birds brought in crowded together in a gourd ("kibuyu"), frequently their feathers hopelessly messed up with bird lime ("ulambo") and their long tails missing. Explaining to the dense Wagogo youngsters seemed useless until we refused to purchase any birds but those in good condition. The numbers fell off greatly but in a couple of weeks 90 per cent of the birds brought in were in excellent shape.

They crave papaw, which they fall upon greedily and distend their crops until these look like so many rubber balloons. The food soon passes through them and I doubt if it is really good for them. Under natural conditions I have seen them feeding on a tree burdened with a crop of hard berries. In captivity they become remarkably tame, rarely attempting to escape, and allowing themselves to be freely handled. Their whistling cry at the sight of food was a characteristic noise at feeding time.

Plenty of sand in the cages is a necessity, and this should be changed daily. (Dodoma, vi. 26.)

CORACIAS CAUDATUS CAUDATUS Linnaeus

LILAC-BREADED ROLLER

Two of these birds were brought in during the month; they did not take very kindly to meat immediately, being rapacious over their natural diet of grasshoppers, which they could hardly ever view with indifference.

Large brown cockroaches were seized with avidity when presented to them, and fortunately these insects were by no means uncommon, so that on the average the rollers got at least one a day.

When both were hungry they were quarrelsome and pecked each other viciously, uttering their harsh and noisy cries while they fought. The bird is distinctly uncommon at Dodoma, probably because grasshoppers are not present in sufficient numbers during the whole year, as I fancy they would be at Morogoro, where this species is so abundant. Nesting sites are also a possible difficulty in this thorn bush country except in areas where baobabs are numerous. (Dodoma, vi. 26.)

LOPHOCERUS MELANOLEUCUS MELANOLEUCUS (Lichtenstein)

CROWNED HORNBILL

LOPHOCERUS DECKENI (Cabanis)

VON DER DECKEN'S HORNBILL

Neither of these birds occur commonly at Dodoma, though both may be seen occasionally. Half a dozen of the former and about 50 of the latter were brought in but did not do well in captivity, nor is this entirely attributable to the fact that in most cases the long tail feathers had been plucked out by their captors.

Von der Decken's seemed hardier in captivity than the crowned hornbill, but it is rather difficult to be certain owing to the disproportion in their numbers. It is useless to place their food in a plate; it must be in a bowl into which they can thrust their beaks; even then they wantonly throw most of it about the cage and eat but a small proportion. Chopped meat formed their principal food and was superimposed on half a bowl of rice, of which they took but little. Papaw cut transversely and placed in each cage was pecked at a good deal. Seeing flocks of these birds feeding in the "mtama" fields at Saranda—from which they rose like flocks of sparrows—I supposed "mtama" would be acceptable to them, but this was not the case.

Their chief characteristic was their endless hammering at the sides and netting of their cages. Double-wire netting would only survive the attack for a day, for as soon as a strand was cut they would promptly twist the loose ends about and soon enlarge the hole, through which they would escape. Fully a dozen adventurous birds got free but were recaptured.

An unwary hand put into their cages to place food or remove an empty water dish could count on receiving a most painful jab from the point of a bill or else a tweak no less unpleasant.

Grass instead of sand on the floor of their cage enables one to recover the scattered meat which they throw about; it can then be used for feeding to the ducks. (Dodoma, vii. 26.)

RHINOPOMASTUS MINOR CABANISI (DeFilippi)

WHITE NILE SCIMITAR BILL

A bird in fine condition was brought in on July 3. It is the second in two months, the first not being accepted. It was not at all shy and threw its minced meat all over the place. I can not definitely say it ate any, though I think it did. Three days later this bird died. (Dodoma, 9 vii. 26.)

EUROCEPHALUS RUEPELLI BOHMI Zedlitz

TANGANYIKA WHITE-HEADED SHRIKE

This species, so common in the thorn bush around Dodoma, would not feed on minced meat and was therefore released. (Dodoma, viii. 26.)

UROLESTES AEQUATORIALIS Reichenow

EQUATORIAL LONG-TAILED SHRIKE

A pair of these birds were collected for locality record and their stomachs found to contain grasshoppers. Fairly common. (Saranda, 14. vii. 26.)

LANIARIUS FUNEBRIS FUNEBRIS (Hartlaub)

LARGE GRAY-BLACK SHRIKE

One or two brought in each month, none of which survived. (Dodoma, viii. 26.)

CORVUS ALBUS P. L. S. Müller (*SCAPULATUS* Authors)

WHITE-BREADED CROW

These handsome crows are the most conspicuous large birds in Dodoma town and vicinity. They frequent the garbage dumps and slaughterhouse and in return for their usefulness as scavengers are protected. By offering sixpence each for them a steady stream of birds, at the rate of one or two a day, came in, until we had 33 at the end of the month and refused to purchase any more.

They are hardy in captivity, eating raw meat or dead birds and rats with avidity. Before giving them their favorite fare, a plate of rice would be put in each cage of crows and they would take it—apparently under protest, as the plates were very rarely cleaned up. Grass and not sand is advisable in the cages, otherwise the birds drop their meat in the sand and either refuse to eat it or eat it covered with sand, which can hardly be good for them. (Dodoma, vi. 26.)

CORVULTUR ALBICOLLIS (Latham)

WHITE-NECKED RAVEN

What has been said of the white-breasted crow's diet applies equally well to that of these larger birds, easily distinguished from the former by the absence of white on the breast. It is a good plan to furnish both species with a skull, some ribs of meat, or other bones

at which they can pick during the day between their regular feeding hours of 9 o'clock in the morning and 5 o'clock in the evening. It is unfortunate that in the confines of a cage both birds mess up their handsome black plumage by going beneath the perches when their companions are above them. To make them more presentable, Haweis gave the six ravens a bath and washed their plumage with soap and water. In 24 hours, however, it was a case of "as you were."

They are not as numerous as the crows, but about-sunset every evening considerable numbers may be seen circling about the larger kopjes in the vicinity of the town. The sheltered ledges of rock where they roost were distinguishable, but I came across no nests either old or new. (Dodoma, vi. 26.)

BUPHAGA ERYTHORHYNCHA ERYTHORHYNCHA (Stanley)

RED-BILLED OXPECKER

Native name.—Nghasi (Chigogo).

A fledgling, the sides of whose bill are still soft, has been brought in and eats minced meat with relish, clamoring for it and taking it from my fingers. After the arrival of the greater kudu from Kondoa Irangi a pair of adult oxpeckers might be seen on it every morning in the wall-inclosed yard where it was kept. (Dodoma, 7. viii. 26.)

SPREO SUPERBUS (Rüppell)

WHITE-BANDED GLOSSY STARLING

One or two birds received in May did not live, for some inexplicable reason. Half a dozen now in the collection are fed on minced meat, papaw, and boiled rice. Flocks of these starlings were to be seen feeding daily on a rubbish dump during May and June. (Dodoma, vii. 26.)

LAMPROCOLIUS SYCOBIUS PESTIS van Someren

SOUTHERN GLOSSY STARLING

Some 40 birds received during the last four months are fed like the last-mentioned species, with excellent results. They have very large appetites and it is necessary to feed them several times a day if their plates are empty. In the confinement of a cage their beautiful plumage is messed up by birds sitting on perches above them, so it is well that they should not be overcrowded. Plenty of sand in the bottom of the cage is a necessity and should be changed daily. (Dodoma, viii. 26.)

COSMOPSARUS UNICOLOR Shelley

OLIVE LONG-TAILED GLOSSY STARLING

Half a dozen specimens received, of which only two survived; they were kept with the southern glossy starlings. (Dodoma, vii. 26.)

ONYCHOGNATHUS MORIO SHELLEYI Hartert

GREAT RED-WINGED STARLING

It was a surprise when one of these birds was brought in, but later I found them plentiful on a kopje to the west of the town. The bird did not live. (Dodoma, vi. 26.)

BUBALORNIS NIGER NYANSAE (Neumann)

BLACK-WINGED CORAL-BILLED WEAVER

Three birds in prime condition were brought in about the middle of the month. They showed no embarrassment in captivity, retained a pride in their personal appearance, and fed well upon rice and "mtama." (Dodoma, vi. 26.)

DINEMELLIA BOHMI (Reichenow)

BOHM'S GIANT WEAVER

Two received, but did not live. (Dodoma, vii. 26.)

SPOROPIPES FRONTALIS EMINI Neumann

EMIN'S SCALY HEADED FINCH

HYPHANTURGUS NIGRICOLLIS MELANOXANTHUS Cabanis

COAST BLACK-MANTLED YELLOW WEAVER

TEXTOR NIGRICEPS NIGRICEPS (Layard)

BLACK-HEADED WEAVER

AMADINA FASCIATA ALEXANDERI Neumann

CUT-THROAT FINCH

QUELEA SANGUINIROSTRIS ? CANDIDA Friedmann

SOUTHERN MASKED WEAVER FINCH

PYROMELANA HORDEACEA SYLVATICA Neumann

RED-CROWNED BISHOP BIRD

VIDUA species

WHYDAH

GRANATINA IANTHOGASTRA IANTHOGASTRA Reichenow

PYTILIA KIRKI Shelley

EAST AFRICAN FIRE-THROATED FINCH

LAGNOSTICTA species

CRIMSON FINCHES

All the foregoing species of weaver birds were placed on a diet of "mtama" or "uwele" and all save the last survived in considerable numbers. It will be readily understood that where birds are carried in the hot hand of a native their chance of survival is small.

One day about 80 bishop birds were brought to us in crates and apparently all right, though the men that brought them were fagged out and said they had had an eight-hour walk. The birds fed well, but next day about 10 were dead and many more on succeeding days until their numbers were reduced to 40.

URAEGINTHUS BENGALUS CYANOCEPHALUS (Richmond)

BLUE-HEADED BLUE WAXBILL

A bird flew off its nest containing three fresh eggs. (Dodoma, 15. v. 26.)

Another flew from a pendant weaver's nest of the short-spouted type (*Ploceus* species) and in it were three waxbill eggs and one or more young. Yet another bird was flushed from its clutch of eggs, in a typical nest situated in an acacia thorn. (Dodoma, 18. v. 26)

A number of these birds were caged and did very well on a diet of "uwele" heads. (Dodoma, 31. viii. 26.)

PASSER GRISEUS SUAHELICUS Neumann

COASTAL PALE-BELLIED SPARROW

A nest with young was found in that of a swallow's (*H. unitatis abyssinicus*) under the station roof where several other sparrows also had their nests. (Nzingi, 25. v. 26.)

Many nests containing young under the roof of our house here. (Dodoma, 5. v. 26.)

Fledglings invariably died in captivity. Adults do well on a diet of "mtama" and "uwele." (Dodoma, viii. 26.)

SERINUS DORSOSTRIATUS DORSOSTRIATUS Reichenow

These finches do not stand captivity at all well, none surviving more than a week. (Dodoma, viii. 26.)

SERINUS ICTERUS subspecies

LITTLE YELLOW SERIN

A number of these birds lived well, while others, probably maltreated before being brought in, died. Two nests, each containing three young, were found at Dodoma on May 14, 1926. One brood took to wing when disturbed.

EREMOPTERYX LEUCOPAREIA (Fischer and Reichenow)

RED-CAPPED FINCH LARK

A female red-capped finch lark was shot off its nest at Dodoma, May 19, 1926. The latter contained three semi-incubated eggs measuring 17 by 13 mm.; the ground color of the eggs was white, upon which were superimposed olivaceous-brown specklings; these covered

the whole surface but varied in intensity. The nest—it hardly merits the name—was about 2 inches in diameter but without bottom; the eggs, resting on the ground, were surrounded with a neat little circle of fibrous grass and rootlets with a few heads of grass beside it. The nest appeared to be built in a depression, but this was not the case, as it was only among grass roots at the base of a little tussock on more or less open and bare ground.

MOTACILLA AGUIMP Dumont

AFRICAN PIED WAGTAIL

One of these wagtails left the station roof at dawn; it was apparently nesting there. (Nzingi, 25. v. 26.)

An African pied wagtail regularly frequented the veranda of Mr. Robbie's house, where, to my surprise, it occupied itself in picking up crumbs. (Saranda, 16. vii. 26.)

A one-legged bird might often be seen feeding about the "boma"; a month later I saw one in the same condition, and presumably the same bird, feeding near our house, which is half a mile from the "boma." (Dodoma, viii. 26.)

CHLOROCICHLA FLAVIVENTRIS subspecies

YELLOW BULBUL

During June, July, and August a great many of these birds were brought in and the majority proved hardy, thriving on a diet of papaw and rice. If there was a delay in giving them their food after they had caught sight of it, they thrust their heads through the netting and piped vociferously. (Dodoma, viii. 26.)

PYCNONOTUS TRICOLOR MICRUS Oberholser

KILIMANJARO YELLOW-VENTED BULBUL

These birds do well for a time on a diet of papaw and boiled rice and then usually die, without a doubt owing to some deficiency in the diet. (Dodoma, viii. 26.)

CICHLADUSA GUTTATA RUFIPENNIS Sharpe

LAMU SPECKLED BABBLER

Two or three of these lovely little songsters were brought in but refused all food. (Dodoma, vi. 26.)

* * * * *

The bringing in of sunbirds and warblers was strongly discouraged, as their chances of survival were remote.

REPTILIA

It is hoped that the following notes may form a fairly exhaustive list of the reptiles found in the immediate vicinity of Dodoma township.

CHELONIA

KINIXYS BELLIANA Gray

BELL'S HINGED TORTOISE

Native names.—Furgobi (Chigogo); Furgobi (Kiswahili).

Decidedly scarce in the Dodoma district; one example was brought in from Kongonda, 9 miles outside the township. Only four were caught during as many months. Several others came from Mbulu in the Arusha district. They feed well in captivity and took papaw quite readily.

TESTUDO PARDALIS Bell

LEOPARD TORTOISE

Native names.—Malugangi (Chigogo); Furgobi (Kiswahili).

Also by no means common, though apparently more abundant than Bell's tortoise, as over a dozen were brought in from the country around Dodoma. A very large one was taken on the railway line at Nzingi, another at Irazo. Most of the 34 individuals brought home by the expedition came from the Shinyanga, Arusha, and Kondoa Irangi centers.

One of the Arusha tortoises was the largest Tanganyika Territory specimen I have yet seen. A Tabora tortoise laid two eggs, on August 5 and 25, respectively. It is only presumed that it was the same reptile laid both. These eggs measured 38 by 40 mm. and 40 by 40 mm.

A tick (*Amblyomma marmoreum*) was taken from one of these tortoises.

TESTUDO TORNIERI Siebenrock

SOFT-SHELLED LAND TORTOISE

Testudo loveridgii BOULENGER, 1920, Compt. Rend. Acad. Sci., Paris, vol. 170, p. 264.

Some interesting additions to our knowledge of this reptile resulted from the expedition. It was collected at Dodoma and Tabora (from which *T. loveridgii* was first recorded), but an individual was also taken near Kondoa Irangi, 105 miles to the north of Dodoma; two from Mfilima, two from Kikombo, both the latter localities comparatively near Dodoma, and Kibakwe, about 80 miles to the southeast and not more than a dozen miles (if my memory is correct) from Ikikuyu, the type locality of *Testudo procterae*. The offering of a

large reward caused the natives to scour the countryside within walking distance of Dodoma and demonstrated that the creature is not really rare, though I collected only three individuals in as many afternoons spent in searching for them; all three were together, some 5 feet up in a fissure from which it took us an hour to dislodge them.

A male soft-shelled tortoise unsuccessfully endeavored to mate with a female Bell's hinged tortoise (which shared the same inclosure with many of the former) for the space of five minutes. She continually walked away. (Kilosa, 5. ii. 1921.)

At 9 o'clock in the morning, on the top of a large sloping rock measuring about 50 by 20 feet, I found two small soft-shelled tortoises basking in the sunshine. A little later a third was discovered nibbling some very dry grass on the top of the same kopje; all were in a well-nourished condition. Two natives and myself hunted for an hour without finding any more. In length and breadth they measured 94 by 78 mm., 80 by 68 mm., and 70 by 65 mm. They had divided supracaudals, though one was a little doubtful. (Tabora, 18. xi. 21.)

Dr. Otto Wettstein,⁵ after a very thorough comparative study of a topotype *T. loveridgii* with the type and other examples of *T. tornieri* which was based on a slightly aberrant individual, arrived at the conclusion that the former must now be included in the synonymy of the latter, an opinion which the present series fully corroborates.

In a series of 25 tortoises, one example (No. 23009, Mus. Comp. Zoöl.) has a depth of 21.6 per cent of the length, a condition very close to that of the type of *T. tornieri*, where it is 21.7 per cent. The range in this series is from 19.5 to 34.6 per cent; to give the average is of little use, as it is entirely dependent on whether the specimens are young or adult. The nearest specimen in actual length and breadth to the type of *T. tornieri* is No. 33004, which measures 162 by 114 mm., yet its depth is 24 per cent as against 21.7 per cent in the type of *T. tornieri*, which measured 161 by 110 mm. In the whole series the range of breadth in relation to length is 69.1 per cent to 94.2 per cent. The variation in relative breadth and width is truly astonishing and the actual specimens need to be seen before it can be fully appreciated as figures give but a poor idea of its extent.

These dimensions are based on measurements of the greatest length and breadth of the whole shell, obtained by placing the tortoise between two blocks of wood. Miss Procter's measurements were taken across mid-body, while usually the greatest width, as well as depth, is about the region of the insertion of the hind limbs.

Doctor Wettstein has pointed out that the type of *T. tornieri* is aberrant in possessing 9 costal shields besides other variations from the normal. It had 4 costals on one side and 5 on the other and an

⁵Zool. Anz., 1924, vol. 60, Heft 9/10, pp. 201-8.

extra vertebral. Similar aberrations are found in the present series from Dodoma of which two tortoises had 4 costals on one side and 5 on the other; two tortoises had 6 vertebrales; five had 12 marginals on either side instead of 11; in another the lateral marginals are narrow and upturned, having exactly the appearance of roofing gutters. In several the supracaudals are undivided. Some have very strongly embossed plates.

The largest individual, a female, measures 177 mm. in length, 131 mm. in breadth, and 40 mm. in depth, being 17 mm. longer but only 1 mm. broader than the largest previously known specimen, which was also a female. The Kondoa Irangi male measures 152 mm. long by 115 mm. broad.

Two females which died in July were presumably egg-bound, for each was found to contain a single large egg. Just as we were loading the crate of tortoises into the train on September 2, I found a fresh egg had been laid. As there were no other species of tortoises in this crate, it can not but have been that of a soft-shelled tortoise. Unfortunately it was placed for safety under a near-by bush and never recovered. It is quite certain, however, that this species lays but one very large egg.

PELUSIOS NIGRICANS CASTANEUS (Schweigger)

BLACK WATER TORTOISE

Native name.—Malfuti (Chigogo).

Some 50 of these tortoises were purchased from natives. Fourteen came from Mukwese, others from Mtita's near Dodoma.

The largest of this fine series, a male (?), only measured 175 mm. in length by 122 mm. in breadth.

I questioned many natives as to whether they attained a greater size in the Dodoma district, but all were quite definite that they had never seen larger. Compared with a specimen in the Museum of Comparative Zoölogy (M. C. Z. No. 18163) from the Ruaha, Tanganyika Territory, which measures 368 by 248 mm., these Dodoma examples are only dwarfs. Is it possible that the arid nature of the country and the small and scattered water holes are responsible for this state of affairs? Yet there are large sheets of water such as at Nzingi and Bahi where one would expect them to reach larger dimensions.

PELOMEDUSA GALEATA (Schoepff)

COMMON AFRICAN WATER TORTOISE

Natives name.—Malwala (Chigogo).

Over a hundred of these fresh-water tortoises were purchased. Most of them came from the immediate vicinity of Dodoma township where they are very common. I have seen one sunning itself on the edge

of a water hole (where clothes are frequently washed) almost in the town. Others came from Mtita's, Nzingi, Mukwese, and Mbulu.

The largest male measured 197 mm. long, and 128 mm. broad; the largest female 160 mm. long by 130 mm. broad.

Like the black-water tortoise they lived well on chopped meat fed to them in a large tank of water. During July, however, either overcrowding in the tank or some seasonal instinct warning them that it was time all small water holes had dried up caused them with one accord to clamber out and pile themselves inside the wire netting of their inclosure. Putting them back was of no avail and for a week they stayed exposed to the cold winds prevalent at night, until I removed them indoors and packed them into crates containing straw. This, however, proved fatal to the very small ones, a number of whom succumbed.

OPHIDIA

At my request, Mr. Carnochan, who was purchasing snakes in the Shinyanga subdistrict, sent down two of the Wanyimwezi snake-catchers called "Wayeye." These youths, named Gुरुкеzi *bin* Umbwa and Kifinda *bin* Maganga, were not full initiates into the mysteries of their art. I intended to have gone fully into the question of their treatment of snake bite, but as I found Mr. Carnochan had already collected much matter relative thereto which he purposes publishing I let the matter drop.

That there is something in their knowledge of snake cures I still believe, though there is a considerable admixture of ignorance and charlatanry in their lore, but the fearless way in which they will handle Egyptian and spitting cobras is not a little astonishing. I have included in the following remarks sundry notes jotted down as given me by Gुरुкеzi, with the approval of Kifinda, from which it will be seen that they have "cures" for the bites of many harmless species, which they believe poisonous.

The Chigogo names of reptiles should be accepted with reserve until checked over by some acknowledged Mgogo expert snake hunter. They were given me by a group of old men who would be as likely to confuse species as any similar group of Europeans called upon to name the reptiles of their neighborhood.

PYTHON SEBAE (Gmelin)

AFRICAN PYTHON

Native names.—Hatu (Chigogo); Satu (Kiswahili); Ngoi (Kikami).

The Wanyimwezi profess to divide the python into three species, employing the Kiswahili and Kisukuma "satu" for full-grown snakes, which they consider belong to a bush-dwelling species. Specimens ranging from 9 to 18 feet, and with a light spot on the head,

are alleged to be a rock and water snake and are known as "sawaka," while young or brightly colored pythons are referred to as "dilemma" and their habitat said to be the waterside.

As may be supposed in a district so poorly supplied with water as is that of Dodoma, pythons are restricted to those areas where permanent water can be depended upon. Thus the only specimen brought in alive came from Bahi and a skin from Kissako. Tracks were also seen at Nzingi and Manyoni. Fortunately, Mr. Carnochan was able to purchase a score of fine pythons in the Shinyanga area, at least 10 of which were over 10 feet in length and one which I personally measured, was 14 feet.

Ticks (*Aponomma laeve*) were removed from it.

BOAEDON LINEATUS Duméril and Bibron

BROWN HOUSE SNAKE

Native names.—Yamukulo (Chigogo).

Two specimens from Dodoma are a yellowish brown color, in conformity with such a desert habitat.

PHILOTHAMNUS SEMIVARIEGATUS (Smith)

BUSH SNAKE

Native name.—Nhangá (Chigogo); Yarudutu (Kinyamwezi).

Mr. Carnochan brought back one specimen from Manyoni which disgorged a gecko (*Pachydactylus bibroni*) when captured. It fed on common geckos (*Hemidactylus mabowia*) during the three months prior to embarkation.

CORONELLA SEMIORNATA (Peters)

SEMI-ORNATE SMOOTH SNAKE

Two females collected by Salimu at Kipetu in Manyoni subdistrict. Their measurements and formulae are well within the range of the species: (1) 460 mm.; 125 mm.; Sc. 21, V. 188, A. 1, C. 71, L. 8. (2) 493 mm.; 140 mm.; Sc. 21, V. 188, A. 1, C. 76, L. 8.

SCAPHIOPHIS ALBOPUNCTATUS Peters

Native names.—Ngolochetzi (Chigogo); Ipela (Kinyamwezi).

Two from Dodoma and half a dozen from Shinyanga.

One of the Dodoma specimens was killed in the kitchen of the geological department's headquarters; the other was brought in alive by a local Monunwezi snake catcher who had torn out its teeth, a fact he stoutly denied.

The largest male measures 1,155 mm. (949 + 206), and largest female 1,017 mm. (880 + 137), thus far surpassing any measurements given for

this species by Boulenger⁶ or Schmidt⁷ but not those of a Dahomey snake recorded by Chabanaud⁸ as being 1,610 mm. in total length.

The ventrals in these males⁹ are 192 and 197 as against a range of 185-189 in Schmidt's Congo series; in the single female they are 216 as against 216-224 in the Congo examples. Caudals in males 71-73 as against 64-69 (Congo); in female 54 as against 58-66 (Congo). It would rather appear as if Tanganyika Territory snakes may form an easterly race with more ventrals and caudals in the males than is the case with central African examples; without more material, however, it would be rash to draw too definite conclusions. Very few authors have given scale counts, and where they have done so they have usually omitted any reference to the sex; the literature of the species consists chiefly of located records.

Dorsal scale counts are all 27-25-21 in my three specimens as against 23-21-17 and 25-23-19 in the Congo series of seven snakes. Scales about eye, exclusive of the supraocular, are 6 or 7; temporals 4 to 6 in first row. Two superposed loreals in both Kizumbi snakes, an anterior and a posterior loreal in the Dodoma reptile. Upper labials 5-6, lower 9-10. In life these snakes were uniformly grayish, in alcohol they are grayish brown; no trace of the white or black spotting of the West Coast forms.

Gurukezi and Kifinda said that they had never been bitten by this species, but that they believed it to be very poisonous, one's skin becoming the color (gray) of the snake after being bitten. For treatment they employ a "dawa" (medicine) called "kilindelamagunda."

Needless to say, it is a perfectly harmless species, and these constitute the first East African examples I have seen. They did not eat in captivity, but drank deeply.

DASYPELTIS SCABER (Linnaeus)

EGG-EATING SNAKE

A very young one from Kikombo and a slough on the station at Nzingi.

CROTAPHOPELTIS HOTAMBOEIA (Laurenti)

WHITE-LIPPED SNAKE

One adult was brought in at Dodoma and I caught two young; one outside our headquarters, the other under the bark of a fallen tree at Mukwese, near Manyoni. Two of these snakes were bitten by an angry boomslang and both succumbed in a very short time. The

⁶ Boulenger, 1894, Cat. Sn. Brit. Mus., vol. 2, p. 254; 1896, Ann. Mag. Nat. Hist., ser. 2, vol. 16, p. 553.

⁷ Schmidt, 1923, Bull. Amer. Mus. Nat. Hist., vol. 49, p. 91.

⁸ Chabanaud, 1916, Bull. Mus. Hist. Nat., Paris, vol. 22, p. 372.

⁹ Boulenger, 1896, Cat. Sn. Brit. Mus. vol. 3, p. 641, records a male from Ugogo (Dodoma district) as having Sc. 24, V. 194, C. 72.

South African name of red-lipped snake for this species is somewhat of a misnomer for East African specimens, as the lips are white in every individual I have seen. In the larger example there are three (not four) chin shields followed by the transversely enlarged ventrals; in the smaller snake many of these ventrals are divided; as a result there are seven pairs of chin or gular shields in this region. The latter specimen has eight labials (3d, 4th, and 5th enter eye) on the left side and nine on the right (4th, 5th, and 6th enter eye).

AMPLORHINUS NOTOTAENIA (Guenther)

One found on the threshold of the kitchen at Dodoma had probably been introduced in firewood. Length H. and B. 300 mm., tail 101 mm., Sc. 17, V. 170, A. 2, C. 75, L. 8 (4th and 5th enter eye).

RHAMPHIOPHIS OXYRHYNCHUS (Reinhardt)

SHARP-NOSED SNAKE

Native names.—Swaga (Chigogo); Simbi or Nzimbi (Kinyamwezi); Msanga (Kikami).

A very common species; about 20 were caught around Dodoma and 40 brought from Shinyanga.

Gurukezi states that the Wayeye only consider its bite slightly poisonous. Fed well on frogs (*Rana mascareniensis*) while in captivity. One laid 10 eggs between August 28 and 31; one of these measured 34 by 22 mm.

PSAMMOPHIS SIBILANS (Linnaeus)

HISSING SAND SNAKE

Native names.—Nyamkando (Chigogo); Yamuwe (Kinyamwezi).

A big series from Shinyanga subdistrict; none seen or brought in at Dodoma. Gurukezi, who seemed decidedly afraid of its teeth, said they bite freely when caught, and for the bite of the "nyulsenga," as they sometimes called it, they apply the leaves of the "lusenga" tree.

PSAMMOPHIS SUBTAENIATUS Peters

STRIPE-BELLIED SAND SNAKE

Native names.—Mlalu (Chigogo); Sangaraza (Kiswahili); Sangaraza (Kikami); Iruwassi (Kinyamwezi).

The Wayeye snake catchers applied two other Kinyamwezi names to this species, calling the pale type, so common in the Dodoma thorn bush, "mbalama" and the dark form "nyalwinzi"; a large series of the latter were obtained in the Shinyanga subdistrict; its plumbeous hue is strikingly different from that of the sandy-colored type. The latter may be seen on the embankments flanking the the railway between Dodoma and Nzingi.

Gurukezi said they considered its bite poisonous, though but slightly so, as there was only a little local irritation; for the bite they apply the leaves of the "kinyamalowa", a shrub about 5 feet in height.

PSAMMOPHIS BISERIATUS (Peters)

TWO-LINED SAND SNAKE

Native name.—Zokalugwagu (Chigogo).

The Wayeye are probably quite unacquainted with this species which hitherto I have only found in thorn bush steppe. They applied their names for *T. kirtlandii* and *D. typus* to specimens shown them, asserting that they were the young of one or the other.

This snake is very common at Saranda, where scarcely a day passed (July 14–23, 1926) without my disturbing one or two basking among the fallen leaves at the base of shrubs, into which they vanished with great rapidity. One had then to remain still and carefully scrutinize the bush, where presently the snake would be found either lying along a branch to which it had applied its whole length or with the anterior third of its slender body stiffened and projecting into space like a twig. One has but to examine the markings of one of these snakes to appreciate how remarkably well their cryptic coloring and slender habit simulate the twigs among which they take refuge. The scale formulae of four specimens were in no way unusual, Sc. 15, V. 148–155, A 2, C. 107–111, L. 8–9, with 4th, 5th, and 6th or 3d, 4th, and 5th entering the eye.

The stomach of one examined contained a large lizard (*Latastia longicaudata revoili*).

THELOTORNIS KIRTLANDII (Hallowell)

BIRD SNAKE

Native name.—Yangalukwe (Kinyamwezi).

The only bird snake received was brought in from Kondoa Irangi and died the following day. The species occurs at Mpapua in Dodoma Province. Gurukezi said they regard it "as poisonous as the mamba, death occurring in one minute if no medicine is used. However, it is not vicious and is frequently brought in with a load of firewood, remaining perfectly quiet until the load is thrown down; if trodden on it will bite."

DISPHOLIDUS TYPUS (Smith)

BOOMSLANG OR TREE SNAKE

Native names.—Yamuhando (Chigogo) for brown variety, Zokalugwagu (Chigogo) for young.

I came across only the brown form around Dodoma, where it was not uncommon; a big female was taken crossing the road at Kikuyu

one evening. The next day, August 28, 1926, this snake laid a single egg measuring 40 mm. in length.

Mr. Carnochan brought back a fine series of color forms from Shinyanga, including a salmon red, one that I do not recollect having seen before. He also gave me the Kinyamwezi names for these various colored varieties, which they, of course, consider distinct species.

Brown, "kalilelala"; brown and olive, "siana"; brown, and white spotted, "yangulukwe"—in Kikami, "lukukuru"; red, "kobokeyamulinga"; and green and black, "gurukezi"—in Kikami, "ngole."

I showed one of these last to a party of old Wagogo men and they called it "nyarudededi"; it is doubtful if it occurs in Ugogo.

APARALLACTUS LUNULATUS (Peters)

BLACK-HEADED SNAKE

A single individual found dead in the road between Manyoni and Mukwese. Sc. 15, V. 156, A. 1, C. 49, L. 7, (3d and 4th enter eye). This record extends the known range of the species much farther east. There is, however, an unrecorded specimen from the Rufigi in the game department collection at Kilosa.

NAJA HAJE (Linnaeus)

EGYPTIAN COBRA

Native names.—Kipara nunga (Kinyamwezi); Sakamala (Kikami).

Six from Simui and two from Ibadakuri, both localities in the Shinyanga subdistrict. I was very much interested in these snakes, as they were the first living Egyptian cobras I had seen in Tanganyika Territory. All were over 6 feet long. They refused to eat food offered during the month they were at Dodoma prior to shipment.

Gurukezi states that this cobra only occurs in big forest, that they are vicious, and that the Wayeye consider their bite fatal.

NAJA NIGRICOLLIS Reinhardt

BLACK-NECKED SPITTING COBRA

Native names.—Nyamwiro (Chigogo); Sweela (Kinyamwezi); Kigau (Kikami).

For the young, showing well-defined red and yellow bands on underside of hood, the Wanyimwezi have another name—namely, "kawosia," and the Waswahili "kikanga."

I gather from a description given me by Mr. Hignell that this snake is occasionally found at Dodoma, though none was seen during the four months that I was there. At Saranda, however, I got two on successive days and one of these was the biggest cobra I had yet taken; it taped over 6 feet alive and I feel confident would be about 7 feet dead and properly straightened out.

This fine reptile was encountered in open maiombo forest and wriggled across our route. I gave chase and threw my stick at it as it speeded up; this caused it to raise its hood, but it came on (I had headed it off meantime), and being stickless I stepped aside; it passed me with a rush and went down a hole only a yard from where I had been standing.

Though flush with the ground this hole appeared to be part of some old termite galleries.

By means of a hoe I had the surrounding vegetation cleared in a 10-foot circle. This revealed another hole, which I plugged; then putting a long stick down the central shaft I stirred it around; in a matter of seconds up shot the cobra's head and it spat as I retreated. This occurred three times, but the snake refused to come out. Digging in the hard ground with the hoe disclosed the fact that it had retired into a side gallery. Out of this I poked it, but this only resulted in its taking refuge in another, where I was successful in pinning down its neck with a forked stick and taking it out. It spat between a dozen and twenty times, and its venom was in no way exhausted right to the end, for when putting it into the bag it nearly hit Salimu, who was holding the bag for me.

At 9.30 o'clock in the morning on the previous day I had seen the head of a black snake protruding from a knot hole in a maiombo tree, the hole was $5\frac{1}{2}$ feet from the ground. Thinking it was either a *Dispholidus typus* or *Rhamnophis jacksonii*, and without giving *N. nigricollis* a thought, I walked up to within 4 feet, twiddling the fingers of my left hand while I imperceptibly approached my snake stick with the right to within 2 inches of his neck.

During this time my eyes were fixed on the oblique scales of a few inches of his neck, which confirmed my idea of a boomslang; also the head seemed much narrower than that of a cobra. I pinned him by the back of the neck against the side of the knot hole, but this being very smooth and the snake having plenty of purchase power he jerked his head free and disappeared into the hole, giving me as he did so a glimpse of white scaling on the throat. For the first time I realized the snake was a spitting cobra to whom I had been presenting my eyes as a target at a range of 4 feet.

I poked a wand 10 feet up inside the tree without effect, then got Salimu to cut away the earth, termites, and decayed wood which filled a hole at the base of the tree. Presently he thrust his bush knife into space and triumphantly announced the way clear. Poking with the wand had no effect, so we lit a smoky grass fire at the base of the tree, but very little smoke drew into the trunk, owing to the fact that the wind was unfavorable. Salimu raked out the smoldering grass and again poked his "panga" into the hole, then jumped back exclaiming "Tayari" (ready) as the cobra's tail flopped into view. I grabbed

this and pulled the owner down and out as he made haste to ascend the hollow trunk, but dropped him like a hot cake when his head came into view.

He made for the next tree, but pursuing I flicked him into a more open space, and had time to see that he was about 4 feet long.

At this juncture he nearly got away, for he traveled very fast downhill toward a belt of impenetrable scrub.

In trying to overtake and pass the snake with my eyes fixed on him, I ran blindly into a big bush of wait-a-bit thorn, which hooked into my bare arms as well as my clothes and so took me some seconds to free myself. I shouted to the boys to head him off, but Salimu, who like myself was very much out of practice, shielded his eyes with a slouch hat and would not go within 30 feet of its head; the other boys also were very tardy about coming forward. Salimu in passing him, however, caused him to halt in a bush and raise his head with spread hood. Just as he dropped to the ground I ran in and flicked him back 10 feet. He spat several times, but my eyes were shielded by my helmet. The cobra now tried to push his head under a fallen tree trunk and gave me the opportunity of running in and pinning his neck to the ground; the rest was plain sailing, though I had only a rather small bank cash bag to cram it into.

After my cautious handling of these snakes it was one of the most interesting and amusing incidents of the whole trip to watch Gurukesi and Kifinda remove these and four others from Shinyanga from their cage and pack them for shipment.

They were certainly very respectful toward the big one, but the others, which were about 4 feet long, Kifinda pulled out of their cage by their tails. Holding a cobra at arm's length in his left hand, with inflated cheeks he would make a dab with his right hand for the back of its neck; sometimes he missed and the twirling, wriggling reptile would nearly get him as it struck at his hand. Nevertheless, neither of them was bitten on this occasion. They both said, however, they had been bitten many times by black-necked cobras, which are common in their district and whose skins are in considerable demand for binding round the drums used in festivities.

When bitten they apply the "musawe" medicine (as detailed under the notes on puff adders) but do not drink a decoction of it. They recover within 24 hours. I asked if they had ever known anyone to die from a bite of this snake; they replied in the affirmative, but said that if you applied the medicine and died it was not a real snake but a wizard ("mchawi"), in which case, of course, you could not expect the medicine to be efficacious.

They believe that it spits in your eyes to blind you, then bites your feet. If the venom gets in their eyes, they apply a "dawa" (katakamakikulu) made of leaves of a small plant bearing the same

name and only a few inches in height. These leaves they chew, then rolling some other leaf to form a funnel, they discharge the spittle into the eyes of the person attacked, who is cured within the hour. I questioned this, and they said it was no infrequent occurrence for their dogs to put up a cobra and get spittle in the eyes; they claimed to be able to cure the animal immediately with "katakamakikulu," so as to resume their walk without the eyes being inflamed or sight impaired.

To prevent a snake spitting they put a "dawa" called "ilende" into its mouth so that the poison will not fly but only dribbles from its jaws. Alternatively another plant called "ilumbalumba" is taken in the mouth of the snake "fundu" while he is bagging the snake and it causes the snake to miss its aim. This plant has a very pungent smell; they brought me one at my request, for it grows at Dodoma. I asked why they inflated their cheeks when handling the cobras and they said the snake was less likely to spit at you when you did so, as it thought you were going to spit at it! Nevertheless I saw the snakes did spit, though none of the venom got in the natives' eyes, as they were quick in turning their heads away.

DENDRASPIIS ANGUSTICEPS (Smith)

GREEN OR BLACK MAMBA

Native names.—?Siana (Chigogo); Fune (Kiswahili).

It will be observed that the name given me by the Wagogo is the same as the Wanyimwezi name for the brown and olive boomslang; there may be some confusion. Near the river at Bahi Mr. Hockley was running after a wounded buck when a mamba shot across his path; five minutes later when quartering the cover he came up with and shot a snake which was apparently the same reptile. As I approached the bush in which it was it darted forward 3 feet (though shattered far back in the body near the tail) and struck at my stick most viciously. It measured over 7 feet but was far surpassed by a magnificent specimen, some 10 feet long, I should think, which was disturbed by Salimu as it basked among some rocks at the foot of one of the Dodoma kopjes. It passed within 20 feet of me as it crossed some open ground, and I had a good look at it. Both these snakes were dark olive in color though popularly known as black mambas. I saw two somewhat smaller ones at Saranda. The only live specimen obtained by the expedition was purchased by Mr. Carnochan near Shinyanga, but its fangs having been removed by its native captors it died within a month, as is usually the case with snakes so treated.

Gurukezi tells me that after a pupil of the Wayeye has gone through the preliminary exercises he is taken out into the bush by the old snake "fundis" to locate a mamba, which, when found, he is told to catch;

should he show fear, the snake doctors beat him with sticks until his fear of them is greater than that of the snake. Generally he gets bitten and is dreadfully ill, but recovers after treatment.

CAUSUS RHOMBEATUS (Lichtenstein)

COMMON NIGHT ADDER

Common night adders are splendid feeders in captivity; some specimens received from Tabora would take toads at noon almost from the hand. In one instance both captives seized one square-marked toad, the first by the left fore leg and the second by the right hind leg. I did not interfere (as the double dose of venom would make things quicker for the poor toad) until the first snake began to swallow from the head; then I attempted to push the second snake off with a flat foot ruler against its mouth. I succeeded eventually, but the bulldog tenacity displayed by the snake was astounding; it fought the ruler for its prey and if pried off at one point would seize at another. Instead of being discouraged by the turmoil the first snake only seemed eager to swallow faster; it actually took eight minutes from the time it struck until the toad's toes disappeared. The second snake lost no time in seizing another toad which it swallowed hind end first. Though doubtless narcotized to some extent the toad remained breathing and blinking its eyelids until its head was engulfed, actually closing its eye to avoid the ensheathed fang which pressed upon it. When swallowing began the fang appeared to be no longer used and remained folded back during deglutition.

CAUSUS RESIMUS (Peters)

GREEN NIGHT ADDER

Native name.—Fuko (Kinyamwezi).

I should think this species does not occur in the Dodoma district. Three specimens purchased in Shinyanga by Mr. Carnochan were all dead on arrival at Dodoma. In the initiation rite which he underwent he was subjected to the bite of this snake, which they correctly informed him was very poisonous; he was then "cured." He pointed out the individual snake to me on his return and on examining its mouth I found the poison fangs had been extirpated. Sc. 15, V. 152, A. 1, C. 16, L. 6.

BITIS ARIETANS (Merrem)

PUFF ADDER

Native name.—Kipili (Chigogo).

The native names for this common reptile are very confusing, as different names are applied to the same individual before and after casting or at different ages.

Some of them are as follows:

"Kipili." "Kiswahili" for young snakes, "Kinyamwezi" for young snakes, also very dark ones.

"Pilipili." "Kisagara" and "Kikami" for young snakes.

"Boma." "Kisagara" and "Kikami" for large snakes; "Kiswahili" and "Kinyamwezi" for yellow or desert-colored forms.

"Moma." "Kiswahili" for waterside puff adders (presumably dark-colored specimens in contradistinction to "Boma").

"Mamba ile." "Kinyamwezi" for large puff adders (reddish-brown specimens pointed out).

A very large series were gathered together from Dodoma, Saranda, Manyoni, Kondoa Irangi, and Shinyanga. The Dodoma snakes are very yellow in color, and I came across quite a number of them in the bush.

Gurukezi tells me that he was once bitten on the fore arm by a "moma"; he sucked the place and then rubbed on "dawa" without any ligaturing or incision. The medicine which he applied is known as "musaweye" and is composed of the leaves of "ilandoyakini," "kacooni," "mgwegwe," "mkuni," "munumbulu," "mtalali," "mkola," "musunga," "kalilalela," "musenga," and "mufuwati."

These are chewed up in the mouth and when dried have much the appearance of green cow dung. It is moistened and a few grains applied to the site of the bite, and a quantity about the size of an ordinary marble is mixed with water and drunk. If the mixture applied to the bite does not remain attached the medicine is no good for that species of snake, and another must be tried. The object of taking it by the mouth is to make the patient vomit the venom. Only one dose is taken.

The Wanyimwezi say that when the puff adder says "Ouuuu" it wants a bird called "kamunda" to eat. Then the "kamunda" comes near and is caught by the snake and swallowed; after feeding the snake retires to the grass in a gorged condition, remaining inert.

A native who was struck by one fang on the knuckle at the base of the index finger of his left hand showed no signs of poisoning on the first day (he was bitten at 9 o'clock in the morning) except that he was drowsy. The next day, however, his arm swelled gradually from the the hand to the shoulder until it was an enormous size by 4 o'clock in the afternoon and his condition was decidedly precarious. Within five minutes of being bitten he was in hospital and cautery and permanganate applied to rather superficial incisions at the site of the bite. Antivenene was injected on the second day.

It seemed possible that he might have recovered without any treatment; at any rate, on the fifth day he was able to rise and wash himself, and steadily improved.

They fed well on rats (*R. c. microdon* and *A. a. neumanni*).

A tick (*Rhipicephalus sanguineus*) was taken from a Shinyanga snake and another (*Amblyomma marmoreum*) from a Manyoni puff adder, taken on June 3, 1926.

LACERTILIA

HEMIDACTYLUS SQUAMULATUS Tornier

A single specimen taken at 8 o'clock in the evening in Dodoma township as it was running across the road. An interesting pallid variety in conformity with such a sandy habitat, the chainlike dorsal markings are only faintly discernible. It has 7 upper and 6 lower labials on the right, 8 upper and 6 lower on the left side.

HEMIDACTYLUS MABOUIA (Moreau de Jonnès)

HOUSE GECKO

Native name.—Ikaka (Chigogo).

Dodoma, Nzingi, Saranda, Manyoni, in houses or on rocky kopjes. At Nzingi two pairs of eggs were found adhering to the under surface of a rock; in one pair were advanced embryos (25. v. 26). These geckos were eaten by captive specimens of the spotted wood snake (*Philothamnus semivariegatus*).

LYGODACTYLUS GROTEI Sternfeld

Dodoma, Bahi, Saranda, Manyoni, Mukwese, on doorposts, fences, and tree trunks. This gecko replaces *L. p. picturatus* in the Dodoma district but was nowhere very common, unless an exception is made of the fence posts at Manyoni station. At Saranda only four were seen in 10 days.

The upper labials in this series range from 6 to 9, the lower labials from 5 to 9; one Dodoma gecko has 7 praeanal pores, the maximum hitherto being 6.

PACHYDACTYLUS BIBRONII (Smith)

A female from Dodoma taken on a wall of a room where *H. mabouia* was common. (19. vi. 26.).

On the left side of the head in this specimen the nostril is pierced between one large anterior and two small posterior nasals; on the right side it is between a large anterior and three small posterior scales. It is the largest example I have ever taken, measuring $6\frac{1}{4}$ inches (81+75 mm.) from rostral to tip of tail. In its stomach were seven large earwigs. A spotted wood snake (*Philothamnus semivariegatus*) was captured at Manyoni in the act of swallowing one of these geckos.

PACHYDACTYLUS TRIEDRUS (Boulenger)

A male, taken on the wall of an outbuilding at Saranda, the same wall being frequented by *H. mabouia* (7. vii. 26).

It has the nostril pierced between the rostral, first labial, and four small scales on the right side of the head; on the left side the labial,

is excluded from the nostril. It appears to be the largest example of its species recorded, as it measures $6\frac{5}{8}$ inches (79+88 mm.). There were many termites in its stomach.

AGAMA HISPIDA DISTANTI Boulenger

DISTANT'S AGAMA

Native name.—Ikulumbi (Chigogo).

Very common at Dodoma on paths in the township. It has a habit of basking on the rails of the main line to Nzingi, and would remain until the trolley, which was traveling at 10 miles an hour, was within 2 feet. A great many were disturbed in this way, but none killed. Two juveniles were taken at Mukwese on June 6, 1926.

AGAMA LIONOTUS DODOMAE Loveridge

DODOMA AGAMA

Native name.—Ntunu (Chigogo).

Dodoma, Nzingi, Saranda, Manyoni, Mukwese.

The young are more or less abundant; the adults extremely scarce. In captivity they were observed to eat grasshoppers, flies, and termites sparingly; they did not thrive, however.

AGAMA LIONOTUS MWANZAE Loveridge

MWANZA AGAMA

Mr. Carnochan has increased our knowledge of the distribution of this handsome lizard by collecting a series from Kizumbi in the Shinyanga subdistrict. Unfortunately, they were very emaciated on arrival at Dodoma and did not feed well, though both insects and vegetable food were proffered. Doctor Thompson, long resident in Mwanza, tells me that this lizard is quite a pest in the gardens there, biting through flower stems so frequently that it was difficult to rear plants at all.

Another interesting fact which he told me and which has since been confirmed by another Mwanza resident is that this race quite frequently enters houses, a thing its Dodoma relative never seems to do.

VARANUS OCELLATUS Rüppell

EYE-SPOTTED MONITOR

One received from Tabora district.

VARANUS NILOTICUS (Linnaeus)

NILOTIC MONITOR

Native name.—Libulu (Chigogo).

Four from Shinyanga subdistrict.

A monitor is said to occur along the river, which is 5 miles north of Saranda station.

NUCRAS EMINI Boulenger

One from Mukwese, near Manyoni, quite typical, with 45 scales across mid-body and 32 transverse rows of ventrals.

LATASTIA JOHNSTONI Boulenger

JOHNSTON'S LIZARD

Two specimens collected at Saranda had been eating (1) termites, (2) a grasshopper.

LATASTIA LONGICAUDATA REVOILI (Vaillant).

EAST AFRICAN LONG-TAILED LIZARD

Dodoma, Nzingi, Bahi. Very common along the railway line and in the cultivated plots of the natives. When disturbed these lizards usually dash down very superficial holes near the base of a bush. If the fallen leaves are cleared away from the vicinity, it will invariably be found that not far off there is a second opening to the burrow. From this the lizard will attempt its escape if digging operations are begun at the hole where it went in. By stopping up the second hole and digging carefully it is not difficult to capture these fleet lizards. One male had the longest tail of any I have caught, its length from snout to vent was only $3\frac{1}{4}$ inches (84 + 230 mm.).

Stomach contents were (1) a full-grown *Eremias spekii*, (2) scorpion, (3) termites, (4) termites, a different species, (5) termites and earwigs.

As already related, one was recovered from the stomach of a snake (*Psammophis biseriatus*).

EREMIAS SPEKII SPEKII Günther

SPEKE'S LIZARD

Common at Dodoma, Nzingi, and Saranda.

As already mentioned, one was found in the stomach of a lizard (*Latastia longicaudata revoili*).

GERRHOSAURUS FLAVIGULARIS FLAVIGULARIS Wiegmann

YELLOW-THROATED LIZARD

Native names.—Sampula mhangе or sangarazi (Kikami). The first name refers to an alleged habit of this lizard, which is said to strip bean grass (*majani mbazi*) from its stalk and carry it to its hole. The second name, sangaraza, is applied to the snake (*Psammophis sub-*

taeniatus) but is quite correctly employed for the lizard, said Salimu. They call *Gerrhosaurus major* by a different name—namely, “guguru.”

Seen at Saranda and Mukwese, but none were collected.

MABUYA PLANIFRONS (Peters)

A skink, which I believe to belong to this species, was seen on tree trunks in the maiombo bush at Saranda on several occasions. They were by no means common and, as they retreated into holes in the tree trunks, I was unable to obtain any.

MABUYA QUINQUETAENIATA (Lichtenstein)

FIVE-LINED SKINK

MABUYA VARIA VARIA (Peters)

VARIEGATED SKINK

MABUYA STRIATA (Peters)

STRIPED SKINK

All three species occur at Dodoma, the two former on the rocky kopjes, the latter ubiquitous but chiefly seen about huts and houses. Besides Dodoma, both the latter were seen at Nzingi, Bahi, Saranda, Manyoni, and Mukwese. At Nzingi, hearing a noise among some boulders, I approached quietly to find a variegated skink hammering a large grasshopper on the ground.

LYGOSOMA FERRANDII Boulenger

FERRANDI'S SKINK

Two from Dodoma and one (alive) from Mukwese, all taken beneath logs.

The anterior nasal is fused with the supranasal, with the result that the nostril is between two instead of three shields. In the skink taken in June the frontal is in contact with the first supraocular on the left side only; in the male taken June 30 it is in contact with the first three supraoculars on the right side only, where there are five supraoculars. The fourth upper labial is longest and the fifth deepest. No dorsal spots or lateral lines. The total length of the male is 130 (71 + 59) mm.

CHAMAELEO DILEPIS DILEPIS Leach

COMMON EAST AFRICAN CHAMELEON

Native names.—Luvu (Chigogo); Ngasi (Wambu); Ngasi (Wakimbu); Kinyonga (Kiswahili).

From Dodoma, Manyoni, Mukwese, and Kondoa Irangi.

About 70 chameleons in all were received. One would scarcely expect such reptiles to be common at Dodoma, and yet nearly 40 were brought in during the first six weeks.

If the subspecies *isabellinus* Günther is recognizable, then all these examples should be referred to that form on the strength of the large, flat scutes on the occipital lobes which differ so strikingly from those of typical West African *dilepis*; the commissure of the mouth is proportionately longer, but there is no appreciable difference in the scutes on the crown, being "flat, not tubercular."

They were fed upon small grasshoppers, which they ate with avidity; apparently flies were only taken when the reptiles were hungry. I had no idea that chameleons would drink, but on my return from Manyoni I placed bowls of water in their cages and saw many chameleons descend to the edge of the bowl and drink as deeply as a tortoise would. Worms (*Strongylurus brevicauda*) were recovered from the stomach of one that died.

AMPHIBIA

XENOPUS MÜLLERI Peters

MÜLLER'S SMOOTH-CLAWED FROG

Common in the deeper wells and water holes near Dodoma township and in marshy spots at Ikikuyu, a few miles from the town. As the water in the wells was 15 feet below the level of the ground, apparently it is impossible for these frogs to escape except perhaps during the rainy season.

The tentacle of an adult taken on May 14, 1926, measures three-quarters the diameter of the eye, but in two young ones collected on August 19, 1926, the tentacles are barely distinguishable and without the adult I should have referred them to *X. laevis*. When the fingers of the right hand are laid together their relative length from the longest to the shortest are 2d, 3d = 1st, 4th; on the left hand 2d, 3d, 1st, 4th.

Two score small frogs taken from Ikikuyu were safely landed in the United States, where they have been doing well for the last six months.

RANA MASCARENIENSIS Duméril and Bibron

MASCARENE FROG

Twenty-eight specimens collected at Dodoma, Bahi, and Mukwese. One was taken in an empty packing case in a back yard of a vacant house at Dodoma, a long way from the nearest water.

On the outward voyage when we put into Kilindini Harbor, Kenya Colony, on May 3, 1926, Mascarene frogs were seen and heard calling. At Dodoma a great many were eaten by the sharp-nosed snakes (*Rhamphiophis oxyrhynchus*).

RANA DELALANDII (Duméril and Bibron)

A single example from a swampy water hole at Mukwese on June 6, 1926.

PHRYNOBATRACHUS NATALENSIS (Smith)

Fifteen specimens from a swampy water hole at Mukwese on June 6, 1926.

CHIROMANTIS PETERSII Boulenger

Six examples were found squatting on aloes, manyara, maize leaves, a post, and in an empty box at Dodoma. Another was taken at Mukwese. As they were found during the dry months, from May to August, apparently they do not aestivate or disappear as *C. xerampe-lina* appears to do.

The length of the frogs in this series ranges from 30 to 65 mm.

I should be inclined to call the loreal region "more or less concave" in all these specimens; in the largest it takes the form of a groove. In most of them the interorbital space equals the width of the upper eyelid, but in one it is less than the width of the upper eyelid. Without actual comparison with the type of *C. kachowskii* Nikolsky from Abyssinia it is impossible to say how far they overlap. In the largest specimen the snout is longer than the greatest orbital diameter; the nostril is a little nearer the end of the snout than it is to the eye. The tibio-tarsal articulation of the adpressed hind limb hardly reaches the ear in the biggest frog, obviously a matter of growth, as in the smallest examples it reaches well forward on the eye and in individuals intermediate in size it falls between the two extremes.

EXPLANATION OF PLATES

PLATE 1

Photographs by R. H. Rockwell

Upper: Typical Wagogo kraal in Dodoma district.

Middle: Wagogo cattle sheltering under Mimosa trees.

Lower: Indian shops in Dodoma township.

PLATE 2

Upper: Combined leopard trap and cage.

Two leopards and one civet were taken at this spot. The bait, consisting of a live goat, is protected by a dense mass of thorns.

Middle: Building a stockade for a giraffe drive at Tulo.

Lower: A corner of the bird room at Dodoma.

PLATE 3

Upper: Nest and eggs of finch lark (*Eremopteryx leucopareia*).

The nest is a mere depression lined with fibers and rootlets, having scarcely any bottom to it.

Middle: Catching a spitting cobra.

By rapidly circling round the reptile it is wearied and eventually drops to the ground for a second. This gives one the opportunity of running in and pinning it to the ground with a forked stick. As the venom carries 6 feet it is necessary to shield the eyes; a cloth is often useful at the moment of capture to distract the reptile's attention.

Lower: Termite workings where a tree frog (*Chiromantis petersii*) was found regaling himself at a break in the galleries.

PLATE 4

Photographs by William M. Mann

Upper: Zanzibar galago (*Galago garnettii*), the first animal obtained by the expedition. Photograph taken after a year in captivity.Middle: White-bearded gnu (*Connochastes taurinus hecki*) after six months in Washington.Lower: Soft-shelled tortoise (*Testudo tornieri*) from Dodoma.



TYPICAL WAGOGO KRAAL IN DODOMA DISTRICT



WAGOGO CATTLE SHELTERING UNDER MIMOSA TREES

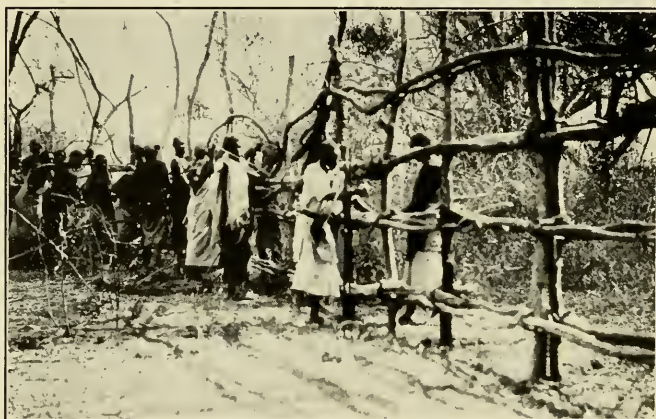


INDIAN SHOPS IN DODOMA TOWNSHIP

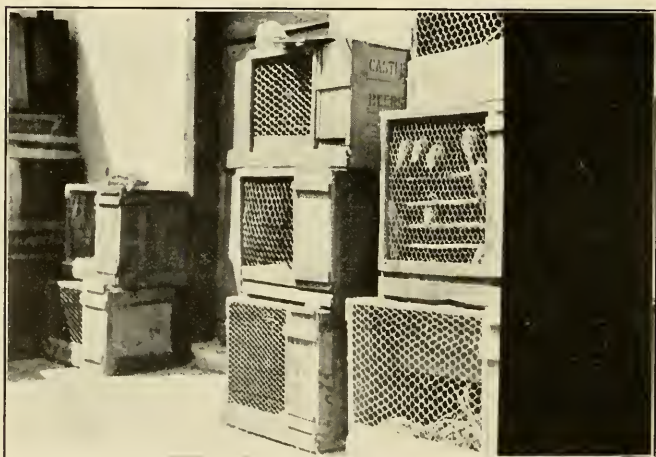
FOR EXPLANATION OF PLATE SEE PAGE 69



COMBINED LEOPARD TRAP AND CAGE



BUILDING STOCKADE AT TULO



A CORNER OF THE BIRD ROOM

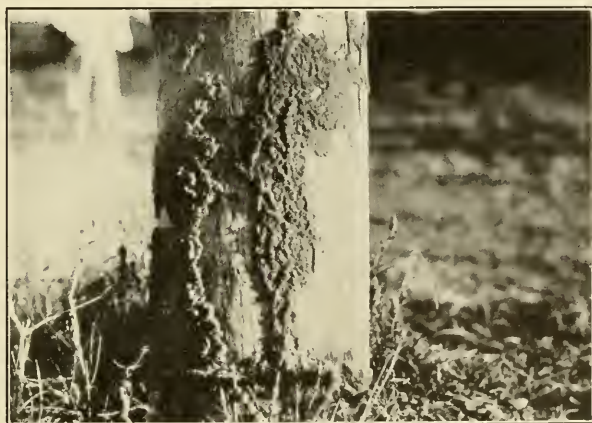
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NEST AND EGGS OF FINCH LARK



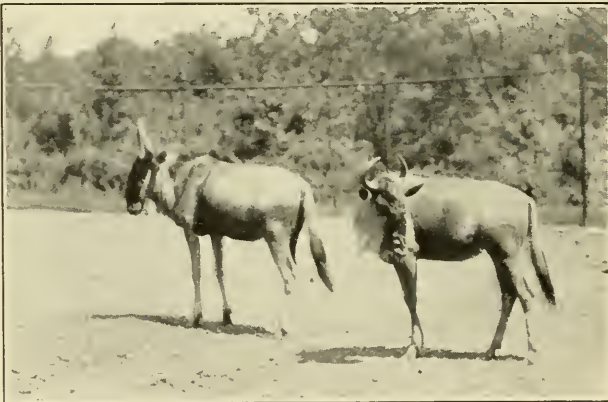
CATCHING A SPITTING COBRA



TERMITE WORKINGS WHERE A TREE FROG WAS FOUND



ZANZIBAR GALAGO, THE FIRST ANIMAL OBTAINED BY EXPEDITION



WHITE-BEARDED GNU AFTER SIX MONTHS IN WASHINGTON



SOFT-SHELLED TORTOISE FROM DODOMA

FOR EXPLANATION OF PLATE SEE PAGE 69